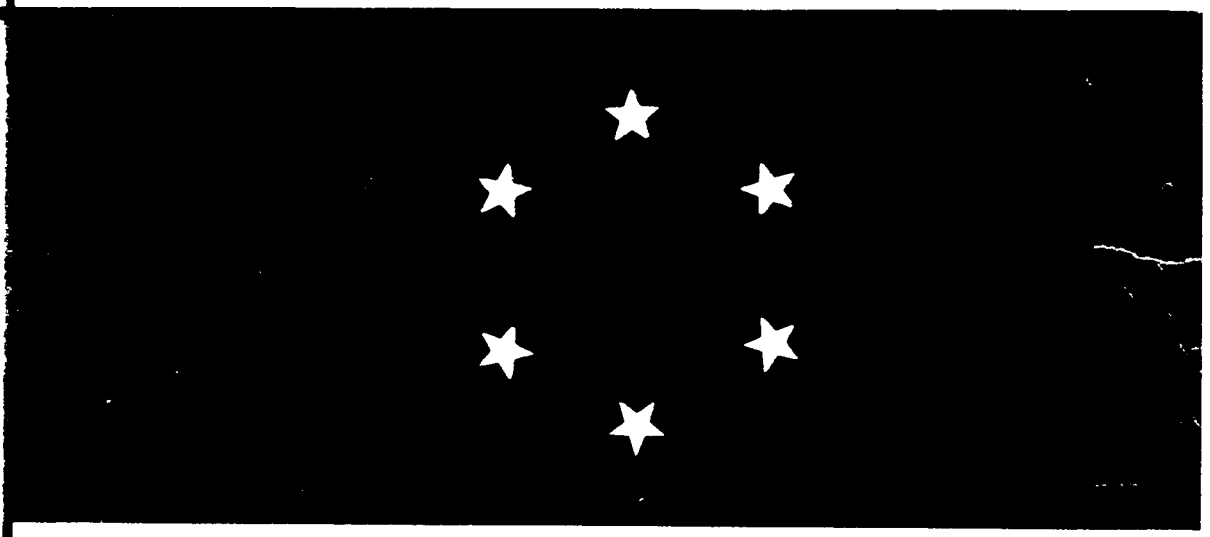


ECONOMIC DEVELOPMENT PLAN FOR MICRONESIA:

A Proposed Long-Range Plan for Developing the Trust Territory of the Pacific Islands

PART II

December 1966

Robert R. Nathan Associates, Inc., Washington, D.C.

PART II

EXPANSION POSSIBILITIES BY ECONOMIC SECTORS

The general development of the economy must result from the sum of the specific developments in each of the sectors of the economy. The actual or potential major private sectors of the Trust Territory economy are general agriculture, the copra industry, commercial fishing, manufacturing, construction, wholesale and retail trade, services, tourism and travel, and air and sea transportation. Each of these private sectors is described, analyzed, and assessed for development potential, and development programs are recommended for each in the six chapters of Part II.

ECONOMIC DEVELOPMENT PLAN

for the

TRUST TERRITORY OF THE PACIFIC ISLANDS

Submitted
to the

HIGH COMMISSIONER

Prepared by

Robert R. Nathan Associates
Trust Territory Economic Development Team

Elbert V. Bowden, Ph.D., Economist (Chief of Mission)
James R. Leonard, Development Economist
J. Raymond Carpenter, Agricultural Economist

Saipan, Mariana Islands
December 1, 1966

The total Report is issued in three separate bindings.

Part One Binding contains

Preface

Introduction

Part I: Conditions, Problems, Possibilities; Policies, Directions, and Goals

Chapters 1 - 3

Maps (inside back cover)

Part Two Binding contains

Part II: Expansion Possibilities by Economic Sectors

Chapters 4 - 9

Parts Three and Four Binding contains

Part III: The Economic Impact of Government Expenditures and Programs

Chapters 10 - 12

Part IV: Total Expansion Potential; Resource Needs, and Immediate Priorities

Chapters 13 - 14

Selected Bibliography

PART TWO

LIST OF TABLES

CHAPTER FOUR

CHAPTER FIVE

CHAPTER SIX

CHAPTER SEVEN

CHAPTER FOUR

GENERAL AGRICULTURE

Over the centuries agricultural activity has been the major occupation of the peoples of Micronesia. Other than fishing, agriculture and food gathering provided the only source of subsistence for the Micronesians during the many centuries prior to contact by outsiders. Even today, almost all of the people in Micronesia are engaged to some extent in some kinds of agricultural production. For many people, their agricultural activities provide them with their only means of subsistence and source of livelihood.

By far the greatest cash value product from agricultural activity is from copra. But the actual value of the output of other agricultural commodities, which are not sold but are used for home consumption, is several times as great as the value of the copra harvest. With only minor exceptions, copra is the only cash crop. For this reason, plus the past and present paramount importance of copra and the fact that copra is in several respects a processed product, the copra industry is given thorough

treatment in a separate chapter. This chapter is concerned with all aspects of agricultural activities in Micronesia except the coconut and copra industry.

This chapter includes historical developments and present conditions in agriculture, a descriptive analysis of the resources, available markets, government programs to support agriculture, and a general evaluation of the prospective role of agriculture in the future of the Trust Territory economy. The final section of this chapter presents recommendations for programs and activities designed to take maximum advantage of the opportunities for economic development from the intelligent and well planned expansion of productive agricultural enterprises in Micronesia.

HISTORICAL CONDITIONS AND DEVELOPMENTS

Throughout history agricultural activity in Micronesia has been largely determined by the natural conditions--the climate, the soils, the terrain, the natural vegetation, and the other circumstances and conditions provided by nature. The variations in the tropical marine climate and in the rainfall have had a measurable effect on agricultural activity. Even the typhoons which fairly frequently bring high winds and torrential

rainfall to some of the islands, particularly the Marianas, have influenced the kinds and quantities of agricultural output.

Most of the soils throughout the Territory are deficient in almost all the basic nutrients of nitrogen, phosphates, potassium and in most minor elements. The frequent rainfall and adequate sunshine and other environmental conditions have enabled the natural tropical vegetation to become acclimated and to grow in spite of the soil deficiencies. The predominantly sandy soils of the atoll islands are exceptionally well suited to the growth of the coconut palm which for centuries has been the source of life on the atoll islands. The more fertile decomposed volcanic rock and humus soils of the high islands have supported the natural growth of a much greater variety of tropical vegetables and fruits than are found on the atolls. But the soils of the high islands have been subject to much leaching and erosion from the heavy rainfalls.

Influence of Early Contacts by Outsiders

Agriculture in Micronesia was greatly influenced by early contacts with western civilization. The major changes resulted from the introduction of livestock and from the stimulation of trade in tropical vegetables and fruits.

Although there is evidence that chickens and possibly some other small animals were brought into Micronesia during the early migrations, it was the Europeans who introduced almost all of the domesticated animals. Pigs, cattle, and goats were brought into the Carolines and Marianas to provide food for Spanish ships and garrisons, and carabao (water buffalo) were introduced as beasts of burden. Kotzebue, a Russian explorer, is credited with having brought pigs, goats, and chickens into the Marshalls in 1816. American missionaries brought cattle from Hawaii to Ponape and Kusaie during the mid-1800's.

Some islands served as supply bases for American and English whaling ships, and the island peoples traded coconuts, yams, citrus fruits and other local produce for metal tools, cloth, and other goods. But it was not until the German traders established trading stations and stimulated copra production that the foreign impact on agricultural activity became highly significant.

Influence of German and Japanese Administrations

In 1885, the Germans obtained control over the Marshall Islands, and in 1899 the Carolines and Marianas (excluding Guam) were ceded by Spain to Germany for the sum of $4,000,000.

Throughout the latter 1800's, some individual traders encouraged and/or coerced the island peoples to produce increasing quantities of copra. But there was no organized coconut planting until it was initiated by the Germans in the Marshalls during the 1880's, and in the Carolines and Marianas during the years following German acquisition in 1899.

In addition to their vigorous efforts to expand coconut and copra production, the Germans further contributed to agricultural growth by (a) instituting some individual ownership of land in a few places, (b) establishing and operating an agricultural experiment station on Ponape, and (c) introducing some breeds of livestock in an unsuccessful attempt to establish stock farming.

The German efforts to expand general agriculture (other than coconut and copra production) were minor. But the Japanese, who occupied the islands and deported the Germans during World War I, made a major effort to exploit the agricultural potential to the fullest possible extent. The agricultural expansion programs of the Japanese Administration were designed primarily to meet the increasing demands of their home country for food, fiber and strategic materials.

The Japanese imported labor as necessary, subsidized the settlement of agricultural workers, established a tropical industry research institute at Palau with branches at Ponape and Saipan, introduced new crops, fertilizer, and other modern technology, and succeeded in converting several of the major islands into important centers of agricultural production. The Micronesians, who were far out-numbered by the Japanese and other immigrants during the latter 1930's and early 1940's, were more observers of, than participants in the busy agricultural enterprises.

Table I indicates the size and diversity of the agricultural output of the Japanese enterprises in Micronesia during 1937. The table indicates that there were several major crops, but that sugar cane was considerably more important than all other crops combined in both acreage and volume of product. In 1941 the sugar crop was reportedly valued at $7 million.

In addition to the commercial and subsistence crops reported in Table I, the Japanese continued to follow the German lead by maintaining a concerted effort to increase copra production in those areas where the lands were not converted to other commercial agriculture.

Table I

Reported Acreage and Production of Principal Crops, Excluding Coconuts--1937

Crops	Ponape		Truk		Yap		Palau		Saipan	
	Area Acres	Volume Short Tons	Area Acres	Volume Short Tons	Area Acres	Volume Short Tons	Area Acres	Volume Short Tons	Area Acres	Volume Short Tons
Cereals	72	42	3			1	5	2	326	74
Legumes			3	9			5	7	178	47
Sweet Potatoes	62	276	7	28	724	959	353	653	778	910
Vegetables										
Yams	264	874			67	48	12	6	86	116
Taro	217	579	603	918	734	257	781	2,615	151	476
Manioc	1,285	11,177			7	34	902	5,172	3,620	12,576
Other Vegetables	96	134	44	129	20	117	235	629	1,322	6,216
Fruits										
Pineapple	35	9	17	38	7	27	991	1,263	35	21
Bananas	210	585	17	79	7	7	126	296	193	227
Breadfruit	1,038	4,744	7,574	15,331	168	109	27	2		
Mandarin Oranges	10	2			22	8	67	21	25	14
Others	47	104		4	12	3	94	484	951	201
Technical Crops										
Sugar cane	3	55					20	32	28,355	583,180
Cotton	32	13			15	3			247	32
Coffee	7						7	1	492	290
Miscellaneous							44	1	143	7
Total	3,378		8,265		1,783		3,669		36,902	

From Civil Affairs Guide - Agriculture in the Japanese Mandated Islands - OPNAV 13-17. September 1944.

Table II indicates the use of fertilizers by the Japanese, and illustrates their apparent concern for high yields and maintaining soil fertility. The acreages over which these fertilizers were distributed are unknown, but the application rate was probably low in relation to U.S. standards today. The table, nevertheless, indicates one aspect of the level of agricultural technology practiced within the islands of Micronesia during the period of Japanese Administration.

In attempting to establish a livestock industry the Japanese were much more aggressive than the Germans had been. The success of the Japanese is partly attributable to their scheme of paying direct subsidies or bounties to farmers for maintaining breeding animals and for raising stock. Bounties were paid only after the farmer submitted an annual report indicating the number of animals kept, the cost of upkeep, the place and date of purchase, the number of births and deaths, the number and size of stalls, and the number of animals slaughtered. Although the major effort during that period was toward meat production, dairies were established in both the Ponape and Truk Districts.

Table II

Organic and Inorganic Fertilizer Consumption in the Japanese Mandated Islands for Fiscal Years 1936 and 1937

Inorganic Types	Weight (Kilograms)	Organic Types	Weight (Kilograms)
Super Phosphate	42,695	Soya Bean Cake	27,555
Mixed Fertilizer	128,807	Rape Seed Cake	23,884
Ammonium Sulphate	121,366	Other Oil Cake	7,817
Ammonium Phosphate	138	Bone Meal	1,355
Calcium Cyanamide	5,540	Fish Meal	160,336
Potassium Sulphate	43,475	Rice Bran	62,075
Lime	2,288	Night Soil and Others	25,774
Total	348,834		308,796

Information submitted to General Headquarters, Supreme Commander for Allied Powers, Natural Research Section by Dr. Y. Ashizawa, former Director of Agriculture for Japanese Mandated Islands, from Memorandum of Record. NR. 645.1 (10 December 1949) MG.

Table III illustrates the success of the Japanese in establishing livestock production. The table also shows the effect of the war on the livestock populations, and indicates the best available estimates of the extent to which the livestock populations have recovered from the wartime depletion. The table shows that in most instances the numbers have increased considerably during the past 20 years but have not generally equaled the record populations established by the Japanese.

—

Wartime and Post-War Conditions and Changes

The second World War physically demolished all commercial aspects of agricultural production. All processing facilities, equipment, land improvements, markets and marketing channels were destroyed or eliminated. Immediately following the war, the technical experts, the managers, and the trained laborers of the commercial agricultural industry were deported.

The United States Commercial Company (the agency responsible for directing the reconstruction and economic development of Micronesia) had fewer economic assets to start with in 1945 than the Japanese had had in 1920. Yet the Micronesians, with the help of the United States Commercial Company, succeeded in restoring the agricultural production of the area to an acceptable

Table III

Livestock Numbers--Micronesia[1/,2/]

	Year	Marianas	Yap	Palau	Truk	Ponape	Marshalls
People	1965	10,486	6,438	10,832	25,820	18,958	18,062
Swine	Maximum Pre-War	24,070	6,400		7,000	7,000	3,200
	1946	2,800	600		550	2,650	500
	1965	1,380	700	3,000	3,100	6,000	5,100
Cattle	Maximum Pre-War	14,580	650		250	800	--
	1946	3,100	10		3	100	--
	1965	4,080	25	90	6	400	--
Goats	Maximum Pre-War	8,800	1,000		850	1,400	12
	1946	550	30		35	300	--
	1965	1,150	2	500	980	600	--
Chickens	Maximum Pre-War	260,600	30,000		12,000	11,000	13,000
	1946	21,000	2,500		2,000	5,000	2,500
	1965	11,500	3,500	8,000	16,000	22,000	49,000
Ducks	Maximum Pre-War	8,600	1,000		1,700	150	800
	1946	400	10		115	40	45
	1965	180	1	250	5	500	1,200

1/ Maximum pre-war and 1946 livestock figures taken from "Livestock Survey of Micronesia" Gantt. Vol. 15 - U.S.C.C. Survey Report, 1946. 1965 figures taken from 1965 Trust Territory Report to the U.N. Gantt obtained his pre-war figures from Japanese records which reported maximums achieved during any one year during the Japanese Administration.

2/ Figures for '65 are questionable since there has been no systematic collection of livestock statistics under the U.S. Administration.

subsistence level. Of the four major commercial crops produced by the Japanese (sugar cane, copra, manioc, and pineapple), only copra was successfully reestablished.

PRESENT CONDITIONS

Trust Territory agricultural activities today include many kinds of practices, ranging from traditional practices from the ancient past to a very few instances of fairly modern technology. Almost all of the agricultural activity (excluding copra making) is undertaken for home consumption by the producer or his family, relatives, and friends. The small amount of agricultural output which is sold for cash is usually a byproduct of the subsistence agricultural activities.

The traditional methods of production generally require extensive and inefficient use of land and a relatively high labor input per unit of product. Agricultural output is generally limited to what can be produced with hand implements. Other modern agricultural techniques, such as the use of fertilizers and insecticides, are almost non-existent.

In the area of livestock production, the efforts of Micronesian farmers to date have been neither capital nor labor

intensive. Livestock in general has not thrived, but has survived in such a way that it has fitted rather nicely into the subsistence pattern. Only recently have livestock owners begun to build enclosures for cattle, pigs, or chickens.

Marketable Vegetable Production

In each of the district centers some local produce is now being sold. Also a few of the major islands which are not district centers are trying to ship some produce into the district center markets, but transportation and market arrangement difficulties are seriously frustrating these efforts. The kinds of agricultural products marketed are usually the traditional tropical vegetables and fruits which the people who have moved into the district centers to take advantage of the greater job opportunities can no longer produce for themselves. Only in the Marianas is there any significant production of vegetables other than the traditional tropical crops. On Saipan, small but significant quantities of various kinds of vegetables are produced and sold in the local market which, by Micronesian standards, is sizeable.

On the other two major islands of the Marianas, Tinian and Rota, vegetable production cooperatives have been formed and

the major portion of their produce is grown for export to Guam. Both of these cooperative associations suffer from lack of management and technical expertise. Their combined volume of output and sales (between $50,000 and $70,000 per year) could easily be increased tenfold by the addition of qualified management for production and market coordination, and with the adoption of more modern production methods. In the entire Territory it is doubtful that as much as 200 acres are devoted exclusively to commercial vegetable production.

Cattle Production

Although there is wide variation in rainfall and humidity among districts throughout the Trust Territory, the climatic factor is not one which provides any district in particular with notable comparative advantages in livestock production. Of greater importance is the availability of large areas of good grazing land, necessary supplies (feed, medication), and proximity to large volume markets.

Throughout Micronesia many people raise a few pigs and chickens, but only a few people raise cattle. Local cattle herds generally consist of less than ten head. One Saipanese rancher, however, has leased over one thousand acres of grazing land and maintains a herd of approximately 500 head.

The first major livestock industry in the Trust Territory in recent times is now being developed by the Micronesian Development Corporation. This new corporation has recently leased seven thousand acres of public land on Tinian Island and is investing considerable sums of money in pasture development, fencing, and other capital improvements. The corporation is concentrating on cattle and swine production, and plans to establish a slaughtering and meat processing plant. It expects to build its cattle herd to 7,000 head and to slaughter and process over 5,000 head per year. It also plans to slaughter and market livestock purchased from other local producers. Most of this beef is expected to be marketed in Guam. This American managed enterprise may serve as a model to Micronesian ranchers.

Swine Production

Swine production in the Territory is quite significant. Table III, above, indicates that an estimated 20,000 swine now exist in the Territory. Swine are an important class of livestock throughout the tropical areas of the world. Some 40 percent of the total world pig population is found in tropical areas.

Swine are popular in the tropics for several reasons. The pig is of such size that once slaughtered it can be quickly

eaten by the members of the immediate and the extended family. Pigs are good foragers, can be fed waste food and scraps, and therefore fit very conveniently into the subsistence pattern of production.

When pork is produced on a commercial scale under more intensive management, the pigs become partial competitors to the human population for food. Thus, commercial production even on a small scale can only be feasible if feed can be obtained at reasonable cost. In the districts of Palau, Ponape, and the Marshalls the number of pigs amounts to one for every three persons. This ratio is as high as, or higher than the ratio in many of the developed nations of the world.

Poultry: Chicken and Egg Production

The 1965 report of the Trust Territory Government to the United Nations estimates that there are more than 100,000 chickens in the Territory. Although local individuals have been encouraged to establish commercial poultry enterprises, well over 90 percent of the 100,000 chickens are produced according to the subsistence system and are used only for meat. The subsistence system allows the chickens to run loose and forage for themselves; rarely are the eggs found and used for food.

The only sizeable commercial chicken and egg producer in Micronesia is the Togawa poultry farm in Saipan. This farmer's production is very limited relative to the demand. His flock amounts to only 3,500 laying hens.

One of the major obstacles to establishing commercial poultry enterprises has been the lack of a consistent and dependable supply of poultry feed. Although some district agricultural stations imported and sold poultry feed at one time, this practice has been discontinued in all districts, apparently as a result of some (not insurmountable) logistics, administrative and fiscal problems.

The importance of the production of poultry and other kinds of livestock in a subsistence economy should not be underestimated. It is clear, however, that future developments should be aimed toward commercial production. Subsistence production may well have approached its optimum volume.

Total Value of Agricultural Production

Table IV indicates that the total value product of agricultural activity in the Trust Territory is estimated to be in the neighborhood of $11 million per year. But great care must be used in interpreting and drawing conclusions from this figure.

Table IV

Estimated Value Product of Trust Territory Agricultural Activity - 1965

Type of Production	Percent Population Involved	Value Product in Dollars Domestic	Export
Subsistence Crops	60 - 80	$9,000,000[1/]	
Copra	60		$2,525,117[2/]
Other Cash Crop and Livestock Sales	Less than 1%	150,000[3/]	40,895[2/]
Sub-total		$9,150,000	$2,566,012
Total		$11,716,000	

1/ Value product of subsistence crops estimated to be $100 per capita.

2/ Export values taken from the statistical appendices of the 18th Annual Report to the United Nations on the Administration of the Trust Territory of the Pacific Islands, July 1, 1964 to June 30, 1965.

3/ Value for domestic consumption of other cash crops developed on the basis of recorded local sales, Marianas District, with value for Yap, Palau, Truk, Ponape, and Marshalls estimated.

The value of the copra output, $2½ million, represents the cash actually received from the sale of copra. But the value of the subsistence crops is impossible to determine with any degree of accuracy.

The $9 million figure used in the table is based on rough estimates of quantities consumed per capita. These figures are not at all indicative of quantities of food with the same value anywhere else in the world. Prices are determined by unique local supply and demand forces. To illustrate the significance of this: If the total output of subsistence crops in Micronesia suddenly ceased, the total cost of bringing into Micronesia the foodstuffs which would be required to enable the Micronesians to continue to enjoy their present level and variety of food consumption would probably amount to some multiple of the $9 million figure.

Regardless of the impossibility of accurately estimating the value of agricultural output, there is no question that agriculture is the largest source of real income and support of the people and by far the major indigenous contributor to the Trust Territory economy today.

PRESENT GOVERNMENT ACTIVITIES IN SUPPORT OF AGRICULTURE

Most Government agricultural programs in the past have been oriented toward increasing the level of subsistence production. More recently efforts have been made to develop cash crops; however, even here most efforts have been directed toward promoting labor intensive crops which would dovetail into the subsistence pattern of production. Most crops promoted and projects undertaken have been chosen with inadequate attention to production costs and market prospects.

Five years ago little thought was given to the possibility that labor would ever be scarce or costly in Micronesia. Some labor intensive crops and production practices which are feasible in the low-wage, labor abundant Far East have been advocated and promoted in the Trust Territory. In recent years labor scarcity has developed and labor costs have risen markedly, but there has been little increase in Micronesian labor productivity. Under such circumstances some crops which may have been profitable five or ten years ago are clearly unprofitable today. Almost no attempt has been made to construct economic feasibility estimates for potential commercial crops in the Trust Territory. The few

existing estimates of economic feasibility are very rough and tenuous at best.

The Trust Territory Government, through its Division of Agriculture, is currently undertaking various kinds of extension, education, assistance, and experimental work. The following sub-sections present brief descriptions and evaluations of each of these current programs and activities.

Extension

The agricultural extension program centers around and emanates from the agricultural stations in each of the six district centers. The extension program includes specialty cash crop development and promotion (cacao, pepper, and the like), propagating desirable subsistence and commercial crop species (fruits and vegetables), making desirable planting material available to farmers, and providing technical assistance to farmers on how and what to grow. Most stations maintain small poultry flocks and swine herds of desirable breeds which are sold to native farmers at a nominal fee to upgrade their own livestock.

The extension program carries out and supervises coconut rehabilitation projects when and where these projects are considered to be justified. Generally, a major disaster (typhoon or insect

pest) has been required to justify a coconut rehabilitation project. Extension agents are further responsible for reporting outbreaks of plant diseases and pests and for assisting the farmers in controlling such outbreaks in accordance with instructions from the Trust Territory plant disease and pest control specialists.

The facilities of the six district agricultural stations range from fairly adequate to very poor. With the exceptions of Yap, Truk and the Marshalls, agricultural station buildings have been constructed over the years from wartime scrap and from partially destroyed Japanese facilities. Agricultural machinery and equipment are generally in short supply. That which is available ranges from old and obsolete U.S. Navy cast-offs, to a few pieces which are almost new. Equipment maintenance is difficult and many units are unusable for want of spare parts.

Cattle Project

A special cattle project to supply improved breeding stock for upgrading and increasing cattle numbers and to demonstrate pasture improvement and up-to-date ranching methods has been conducted in the Marianas District since the days of the U.S. Commercial Company. Of all the various breeds and crosses which have been tried, the Santa Gertrudis breed appears to be

as well as or better suited than any other. As a result the Government has been selling its various breeds, which are better than local stock, to local producers and is attempting to build up a 100-head herd of pure bred Santa Gertrudis stock to be used to supply breeding stock to local ranchers.

One problem in making this program work as planned is that most local ranchers look at the high grade breeding animal as "just another animal." The importance of type or breed in determining weight gains in a given time with a given amount of feed has not yet been sufficiently demonstrated to most local farmers.

While cattle numbers have shown a marked increase during recent years, few improvements have been made in local pastures. Equipment difficulties frequently make pasture improvement prohibitively expensive. While with the heavy equipment needed for pasture improvement it should be possible to clear between one and two hectars (2½ to 5 acres) per day, local operators on D-6 and D-8 bulldozers generally are able to clear no more than one-half hectar per day as they spend much of their time trying to keep their obsolete and worn out equipment operating. Generally, the only equipment available for pasture improvement is government owned. Local and district governments sometimes rent this

equipment to local ranchers for land clearing. However, the few landowners who would pay the going rate of $12 per hour are hesitant to use this service, since rarely would they get eight hours of productive work for the $96 eight-hour rental fee, plus the operating and maintenance expenses which are also charged to the rancher.

As cattle numbers have increased, carcass quality has remained low because of inferior breeds and the sparseness and low quality of the available forage. Even though the Government cattle project does not practice dry-lot feeding prior to slaughter of culled animals, the beef it is producing is superior to that produced on the local ranches. Few people get an opportunity to sample the difference in quality, since current policy restricts sales of this beef to hospitals and schools.

The Government operates a small slaughtering facility on Saipan. The butchers in this facility generally have had no formal or apprenticeship training but rather have picked up experience as they have gone along. Usually the small output of local beef is marketed without price differentiation between various cuts; all beef is sold at around 35 cents per pound.

Plant Disease and Pest Control Program

The plant disease and pest control program is a very critical phase of the total agricultural development effort. The level of control of insects, animal pests and plant diseases has a very close correlation with the yield of both subsistence and commercial crops. A small entomology laboratory is operated in Koror, Palau, and a plant disease laboratory has been established on Ponape. Two American agriculturists, one an entomologist and the other a plant pathologist, direct the Territory-wide activities, and are assisted by local employees whom they have trained to act as laboratory technicians and quarantine officers.

Forestry and Conservation Program

The major objective of the Forestry and Conservation program is to safeguard the soil (a limited non-renewable resource) and to manage the forests and water (renewable resources) on a sustained yield basis; such activities as development and management of historic sites in (possible) Territory parks are also envisaged.

The program, which was implemented only in 1966, is presently limited almost entirely to the Palau District. Efforts are now being made to train local staff, to establish a forest

nursery and station, and to inventory some of the commercial species. Reforestation is expected to be one of the major activities of the program.

Agricultural Education

Emphasis on vocational agriculture in the junior and senior high schools vacillates with the turnover in district education administrators and vocational agriculture teachers. Latest reports indicate that in September 1966 there will be no American professional vocational agricultural teacher teaching vocational agriculture in the entire Territory. The public education program has not been designed to meet the needs of an area where more than 80 percent of the population is directly concerned with one form or another of agricultural production.

A Trust Territory-wide farm institute was established on Ponape at the Metelanim plantation in 1962. This institute accepts junior high school graduates for a 9-month course in basic agricultural theory and practice. Enrollment is limited to 20 students. An effort is being made to have all Trust Territory agricultural extension agents attend and graduate from the institute. Two year programs are planned for 1966.

Scholarships for college training leading to the bachelor's degree in Agriculture are awarded annually. Recipients of these

scholarships presently attend the College of Agriculture of the University of the Philippines. Awards are made by the Education Department and are generally accepted only by those students who cannot qualify in the competition for scholarships for study in other subjects at U.S. colleges.

Special Projects

Rice Production. Although the Japanese did not make any serious attempts to establish rice production until their supply lines during the latter part of the war became jeopardized, it is reported that they did develop over 100 acres of paddies for rice production on Ponape. Two rice crops are reported to have been harvested prior to the end of the war, after which the area was allowed to return to its native vegetative state.

Although the Micronesians' demand for rice has continued to rise throughout the post-war period, the rise has been more marked during the last three or four years. Trust Territory rice imports for 1964, 1965 and 1966 were valued at approximately $356,000, $733,000 and $1,005,000 respectively. The increase in rice consumption is a reflection of the increased money incomes from government expenditures, and is an indication of the rising standards of living of the Micronesians.

As a result of the increasing demand, the agricultural division undertook a program to promote rice production on Ponape. The program was organized to follow the Japanese system of cultivation with intensive use of labor, hand tools, some draft animals, and small plots of land. Considerations of topography (lack of large contiguous acreages suitable for paddy development) and the low level of technical ability of potential rice growers, seemed to justify adoption of the Japanese system of production.

Most of the research has been oriented toward finding high yielding varieties which are most suitable to production under environmental conditions existing on Ponape. Although experimental crop yields have been favorable, labor utilization appears to have been excessive. At the present time, 11½ acres of paddy land (including the Kolonia test plots) are in production on Ponape. To date, no careful research has been conducted to determine the economic feasibility of this crop.

Cacao Project. The experience of both the Germans and the Japanese indicated that the cacao (cocoa bean) tree was relatively well-suited to the high rainfall-high islands of Micronesia, outside the typhoon belt. In the early 1950's, a world shortage of cocoa pushed the wholesale price to over 50 cents per pound.

Although these prices eased, cocoa was still bringing over 40 cents per pound in the latter 1950's. The high price, plus the proven environmental suitability prompted the Agricultural Division to undertake a cacao development program. It was felt that coconut palms intercropped with cacao trees would increase the gross returns per acre and would serve to diversify the single cash crop (copra) economy.

In 1957 two Micronesians and one American were sent to Costa Rica for specialized training in cacao production and cocoa processing. In 1959 and 1960, cacao trees of the Trinitero-Forastero hybrid type were introduced in the Trust Territory from Trinidad, New Britain, and Fiji. In 1960, the Division of Agriculture initiated a program whereby they would subsidize the planting of 100,000 cacao trees on the islands of Kusaie, Ponape, Truk Atoll, Palau and Yap. Since the Palauans and Yapese reportedly showed little or no interest, the cacao development program is now limited to the Ponape and Truk Districts.

Cacao production has been actively promoted by the Division of Agriculture since 1959. Present production is far below anticipated levels. The low production has been attributed to rat damage, black pod disease and phytopthora canker. The

disease problems have been reportedly brought under control and extension agents have recently been given special training in rat extermination techniques. Table V shows cocoa bean exports from 1960 through 1965. Although the total cacao output in 1965 was only a little more than 30,000 pounds, 60,000 pounds should be produced and exported in calendar year 1966 and in 1967 the output should exceed 100,000 pounds for a cash value in the neighborhood of $20,000. When all the trees now planted reach mature bearing age, the total annual production should approach one million pounds, valued at approximately $200,000.

Ponape Pepper Project. The program to initiate and encourage the production of "black pepper" was undertaken in 1960 in an attempt to provide an additional cash crop. The Division of Agriculture encouraged pepper production by providing interest-free loans to farmers for the purchase of fern logs and fertilizer for pepper production. The loans, amounting to approximately $200 for a 100 vine pepper garden, would be repaid from earnings from the sale of pepper. To date, 25 one hundred-vine pepper contracts have been executed.

The first harvest of pepper can occur approximately 3 years after the initial planting. The only pepper which is

Table V

Weights and Prices of Trust Territory Outbound Cocoa Bean Consignments

	Date	Weight in lbs.	CIF Buyer Price SF (dollars)	Price lb.* (cents)	Trust Territory Net (dollars)
1	1960	1,245	348.60	28.0	278.89
2	1961	4,977	1,119.83	22.5	2,595.80
3	1962	13,500	3,705.35	27.44	3,134.91
4	1963	12,713	3,496.08	24.97	2,900.40
5	1964	39,158	9,892.83	25.26	7,983.86
6	1965	30,328	6,428.59	21.2	5,001.22

* Generally a 4-6 cents per pound premium above the world price has been received.

S.F. - San Francisco

Data compiled from Atkins Kroll invoices on file with Headquarters Division of Agriculture.

now being harvested in Ponape is produced on the one acre of mature pepper vines which are grown, tended, and harvested by the plant industry station. This station has set up a small pepper processing facility to grind and/or package the harvested pepper. The government presently sells the production from its one acre pepper garden to the Micronesian Spice Association which has been selling the limited quantity as a "gourmet" item to restaurants and other users.

A major problem with pepper production is that intensive labor is required to establish, maintain, and harvest the crop, and the economic return for this effort appears to be low. Although the yields from the government pepper garden are good and the product quality appears to be exceptionally high, no detailed studies have been made of the costs of producing and processing Ponape pepper. Until adequate cost records are compiled and analyzed it will be impossible to determine the feasibility of producing Ponape pepper as a profitable cash crop.

Other Projects. Ramie (a fiber crop) was promoted for a number of years in the Palau District, but the effort was unsuccessful and was recently discontinued. The labor intensive methods advocated for the production and processing of ramie may have been partially responsible for the lack of interest of the Palauan farmers.

Some poorly planned efforts have been made to develop the production of marketable vegetables in the Marpo Valley area of Tinian Island in the Marianas. Land has been cleared and leveled. Supplementary irrigation facilities were supposed to have been installed, and plots leased to local farmers, but for most of the past year the project has been stalled by the lack of funds and the lack of supervision.

LAND RESOURCES FOR AGRICULTURAL PRODUCTION

Appraising the potential of the land resource base in the Trust Territory is, at best, approximate since there has been no consistent classification or mapping of soil-types, or of present or potential land uses throughout the Territory. The land inventory estimates presented here are based on all the available survey information, but it is not unlikely that there are sizeable errors in some of the figures. The classification system used here and in Table VI has the three following general categories:

Arable: Includes areas recommended for cropping and areas of marginal cropland recommended for grazing.

Productive Non-Arable: Includes areas suitable for grazing and areas better suited for forestry due to the steepness of the slopes.

Other: Includes areas most suitable for growing coconuts and all other lands presently used or expected to be used for residential, commercial, industrial, military, and recreational purposes. This category also includes lands which presently appear to have little economic value, such as rock outcrops, lava flows, etc.

Table VI provides an approximation of the land resource base of 31 major islands of the Trust Territory, and indicates the very small total amounts of arable land and the relative advantage of the Marianas District in this regard. These small total acreages are split up among many islands and frequently among many locations on each island. Except on the three major islands of the Marianas it is unusual to find large contiguous areas either of arable land or of lands suitable for grazing. Obviously, these land conditions will impede the development of most kinds of commercial agriculture in most places in the Trust Territory.

Soil Types and Fertility

The following sub-sections provide descriptions of the soils in each of the six districts. These descriptions are

Table VI

Land Use Suitability Inventory Estimates, by District[1/]
(all figures in acres)

District	Total Land Area	Total Cropland Japanese Admin.	Arable		Non-Arable		Other	
			Recommended for Cropland	Marginal Recommended for Grazing	Grazing	Forest	Most Suitable for Coconuts[2/]	All Other Commercial, Residential Idle, etc.
Marianas	89,262	36,902	18,404	10,695	13,653	23,183	3,192	20,135
Palau	98,744	3,669	4,675	2,057		62,589	1,951	27,472
Yap	27,712	1,783	2,263	1,909		12,215	6,720	4,605
Truk	19,689	8,265	786	2,361		4,576	5,532	6,434
Ponape	109,667	3,378	7,486	545	3,964	49,775	19,000	28,897
Marshalls	27,555						18,073	9,482
Sub-Total		53,997	33,614	17,567	17,617	152,338	54,468	97,025
Total	372,629		51,181		169,955		151,493	

1/ Estimate developed from analysis of generalized soil mapping by the U.S. Geological Survey (for U.S. Corps of Engineers "Military Geology" series made for some of the Trust Territory Islands), and other miscellaneous data both recorded and collected in the field. Due to the inconsistencies, gaps, and generalized nature of the raw data analyzed, the system used classifies soils roughly on the basis of soil texture, drainage, fertility, slope and depth as affected by climatic and hydrologic conditions.

2/ No reliable data for acreage planted to coconuts is available.

based on the scanty information available, and are only meant to be indicative of soil types and fertility which would generally be found on the major islands in each district. There are generalized soil maps for some of the major islands.

Marianas District. The soils in the Marianas District are of volcanic and elevated coral reef origin. Zonal clays range from Latosols with Regosolic development, through Latosolic red, yellow Podzolic intergrades to Latosols. Intrazonal clays consist mainly of Latosol Brown Forest intergrades. Azonal soils consist largely of the Regosol-Lithosol Shioya loamy sand and aluvial clays.

Usefulness of some of the volcanic soil on the major islands in the Marianas has been reduced to some extent by erosion accompanying clear tillage during the Japanese period. Although repeated burning has had the effect of lowering the organic content of most of the soils, with careful management most of the aluvial soils and clays would support selected forage crops for grazing. Some of the deeper aluvial soils and clays such as Chacha and Saipan series could support mechanized systems of crop production with careful management, the use of fertilizer and properly planned crop rotations.

More than half of the total land area suitable for cropping and more than two-thirds of the total land area recommended for grazing in the Trust Territory, are located in the Marianas District.

Palau District. All of the Latosols which make up some 60 percent of the soils in Palau are poorly suited to Agriculture since they are strongly acid and low in organic matter, nitrogen, phosphorus, potassium and most minor elements. The aluvial soils are most productive. These soils are confined to the flood plains on the large mountainous island of Babelthuap, and are generally isolated due to lack of roads. Most of these soils would require major drainage works to be suitable for commercial production.

Yap District. The high islands of Yap are of volcanic origin. The Latosols which mantle some 25 percent of the high volcanic islands of Yap are generally strongly acid, infertile clays. Of the Planosols, the Rull Silty Clay Loam is one of the most productive agricultural soils on Yap even though it is generally imperfectly drained. The more gently sloping phase of the Weloy-Rull Silty Clay loam has a fair potential for agriculture because of its low acidity and relatively high fertility. The aluvial soils which make up the coastal flats

could produce taro and probably rice. These areas presently support coconut plantations and are not generally suited to most commercial crops due to the high water table.

Truk District. The most extensive soils in Truk consist of clays and stony clays which extend over more than 60 percent of the land area and are located on the high volcanic islands in the Truk Lagoon. Saturated or periodically flooded organic soils of mangrove and fresh water swamps cover some 20 percent of the land area. Well drained Shioya sand makes up some 5 percent of the land area and is found in some of the lowlands of the high islands and on most of the atoll and reef islands.

The Fefan soils range in depth of from one to eight feet, are relatively fertile and well drained, and probably are the most suitable soils for agriculture in the Truk District. Unfortunately, the area of Fefan soils is limited to about 500 acres. Although Truk clay soil has surfered from lateritic weathering, and although its naturally low fertility was aggravated by intensive cultivation by the Japanese, it has been reported that relatively acceptable crop yields can be obtained with heavy applications of fertilizer. The most fertile areas in Truk are the organic marshlands; however, in their present state these marshlands are only suited to subsistence crops such as hydrophytic (wet land) taro.

Ponape District. In the Ponape District, the general soil characteristics are similar to those on the high islands of Truk. On the high volcanic islands of Ponape and Kusaie the relatively steep slopes and rough topography would limit cultivation to the aluvial plains. The aluvial soils cover well over a thousand acres. Extensive irrigation and drainage systems will be required to make many of these areas suitable for intensive production of paddy rice (now under experimentation) and other commercial crops.

Marshalls District. The soils in the Marshalls all originate from coral base islands and atolls, thus consist largely of calcareous sands from eroded coral and shell fragments. Although some organic matter has built up in small areas in the interior of some of the larger islands and supports the growth of some tropical vegetables and fruits, the sandy soils of the Marshalls are generally best suited to the growth of coconut palms.

Impediments to Land Development

Land Tenure Problems. One of the impediments to agricultural expansion arises from the existing patterns of land tenure and the lack of proper land management. The Government's present homesteading program is now serving to compound the

difficulties and to destroy the possibility of using the land resources for the best interests of the people. The present homesteading program does not encourage either the wise use of land or investment in land improvement.

The Germans introduced the concept of "fee simple" (private) ownership of land, and the Japanese continued that policy. Still, today, the many traditional tenure arrangements which continue to persist often create obstacles to agricultural development. The system of undefined ownership by extended families and clans, with use rights by many, discourages investment in land improvement. Land reform is the only ultimate solution, but the careful planning and equitable implementation of a well-conceived land reform program will take much expert effort and many years to achieve.

Land which has considerable economic potential is held in an unimproved state for speculative and prestige purposes. Policies which prohibit or restrict land ownership and use by Americans and other foreign nationals have protected such practices. Restrictive land policy has seriously limited capital investment in land improvement and has retarded over-all economic development. Additional analyses and recommendations on land

management and tenure will be presented in subsequent sections of this report.

Public Land Problems. All the public lands in Micronesia were once owned by families, clans, and chiefs. Under both the German and Japanese Administrations large amounts of land were sold or ownership was otherwise transferred to the foreign administrations, businesses, and individuals. Following World War II, all lands which had been owned by foreign administrations were taken over by the United States Government and were later given to the total population of the Trust Territory, with responsibility for holding title and for proper management to rest with the Trust Territory Government.

Few Micronesians have yet come to realize that the public lands are actually their lands now--a valuable asset of all the people--to be protected and wisely used for the long-run betterment of all. The usual attitude among Micronesians appears to be that these lands are held by a foreign nation--the United States. Some believe that these lands should be taken out of the public domain and given to individuals as quickly as possible. With the healthy development of democratic government in Micronesia--with increasing Micronesian control over governmental

responsibilities, including the public lands--more and more Micronesians will become aware of the fact that the public lands really belong to Micronesia and not to the United States.

The Problem of Access. A further impediment to land development is the fact that with the exception of the three major islands of the Marianas (Rota, Tinian and Saipan) which have extensive systems of paved roads left from World War II, most areas which have some agricultural potential are isolated. Many areas have no roads connecting with district centers, with other local markets, or with shipping ports.

LABOR FORCE LIMITATIONS

One of the most serious limiting factors to agricultural expansion in the Trust Territory is that of the labor force. The most serious labor force problems result from the small absolute size of the population, the many competing demands for the most capable people, the relatively low levels of education and skills of most people who are available for agricultural labor, the attitudes that agricultural activity is less desirable than others, the relatively high wages available in several competing activities, the impediments to individual mobility

within the Trust Territory, and the restrictions on entry of agricultural labor from outside the Trust Territory.

A most optimistic estimate of the Trust Territory total labor force potential would amount to no more than 1/3 of the total population. This is discussed in a subsequent section of this report. Thirty thousand workers would not be a large labor force for Trust Territory agriculture if all the opportunities for production were fully exploited. By way of comparison, during the Japanese Administration over 30,000 persons were employed in the sugar industry. But the fact is that close to 1/3 of the labor force works full time for wages in occupations other than agriculture.

One of the existing dilemmas is that most of those interested in agricultural production are the older people, generally unwilling to adapt to the stricter work regimen required of the commercial producer. The younger people, although better equipped to learn and perhaps more willing to adapt to a regular work schedule, are generally not interested in agricultural occupations, largely because they have other, more attractive alternatives.

Another problem is the generally low education and skill levels of those who are working in agriculture. The ability to speak, understand, and read English or to read native languages is rare among farmers. This illiteracy does not impede their abilities to produce traditional crops on their home islands, but it impedes the dissemination of knowledge about new techniques of production, processing and marketing. Lack of a common language also impedes the mobility of people from one island to another in the Trust Territory. It would not be feasible to translate all technical material into the nine different local languages of the Trust Territory, and much of the terminology required in modern agriculture does not exist in these local languages. If commercial agriculture and increasing productivity and incomes from agricultural activities are to expand in the Trust Territory, the younger people must be involved and those who are literate in English will have a decided advantage over those who are not.

There are many competing demands for the more capable people in Micronesia, and agriculture has been making a very poor showing in the competition for qualified people. By far the major competitor is government employment. Most of those who have received the best educations and have shown the highest

abilities are now employed by the government. Government employment can be expected to absorb almost all of the high school graduates during the next few years. In addition to the government competition for workers, private enterprise, primarily in the fields of wholesale and retail trade, is creating increasing demands for the limited number of qualified people in the labor market.

Agriculture seems to take last place in the competition for workers, especially among the younger and better educated entering the labor market. White collar government employment takes first place for fairly obvious and understandable reasons. The government jobs pay more, offer fairly clean and prestigeous working conditions, generally do not require a high degree of effort, and offer much greater security than would almost any kind of private enterprise employment. The government employees are usually seen as the relatively wealthy members of the Micronesian communities. They are well dressed, frequently seen riding in government vehicles or in their own automobiles or motor scooters, they have motor boats, generally better housing, imported foodstuffs, and enjoy American indulgences such as cigarettes, beer, and whiskey.

The traditional farmer, on the other hand, is one who has little cash and maintains a hand to mouth existence without visible economic improvement. It is not surprising that government employment carries high prestige, and that agriculture is not considered to be a highly desirable occupation. Although there were some examples of productivity and profits from agricultural pursuits during Japanese times, few if any of the young people who are now entering the labor force have had any reason to think of agriculture as any more than a minimum subsistence activity, and a pursuit which the ambitious person should shun.

The emphasis of the public school programs is on developing literacy and expanded understanding, and generally follows a liberal arts approach, designed to prepare students for college entrance. The kind of values to be gained from American-type primary and secondary education do not aim people toward agricultural occupations.

The government wage scale and demand for labor have created and will increasingly create pressures on all kinds of private enterprises to gather and hold capable employees. Although the Trust Territory Government wage scale has not yet entirely priced labor out of the agricultural market, as has occurred in Guam, for example, the Government wage is high enough to make

it difficult for local agricultural producers to compete in both the domestic and foreign markets with their Asian (Japanese, Chinese and Filipino) counterparts.

The seriousness of the wage problem is exemplified by the Micronesian Development Corporation experience on Tinian Island. The minimum wage offering for agricultural labor is $4 per day, and there have been some complaints among the workers that this rate of pay is not high enough. But this rate compares with $2 to $2.50 per day for agricultural labor in the industrialized nation of Japan; $1 per day in the Philippines; and 90 cents per day or less in Taiwan. These wage comparisons point up the necessity of high labor productivity and a resolute determination to prevent further wage inflation in Micronesia if agriculture--which appears to offer the major opportunity for indigenous enterprise employment for many people--is to survive.

An obvious potential solution to the agricultural labor dilemma would be to facilitate and stimulate the immigration of agricultural labor from some of the low wage areas of the Far East. It is almost certain that the agricultural expansion potential of the Trust Territory cannot be realized without the importation of foreign labor. A few of the more aggressive Micronesian agricultural entrepreneurs have expressed a desire

to import limited numbers of employees, but to date no such labor has been imported. The economic expansion impact of bringing in selected quantities of agricultural labor to meet specific needs could have a considerable expansionary impact on the local economies, both by considerably increasing the value product of the output, and by further stimulating local trade and service activities and business profits in the local communities.

In addition to the need to import labor, policies to facilitate the mobility of indigenous labor from one place to another in the Trust Territory will help to meet the needs of commercial agricultural expansion. Considerable increases in total agricultural productivity could be achieved by facilitating the movement of people to the areas of greatest agricultural potential.

CAPITAL AVAILABILITY AND NEEDS

Very little of the kinds of capital equipment necessary for highly productive commercial agricultural activity exist in the Trust Territory. Sources are not currently available to provide the amounts of money necessary for the purchase of the needed capital equipment items. The few private businessmen who

have managed to amass sizeable savings are likely to invest their funds in wholesale and retail trade and other such kinds of activities from which they have managed to make profits in the past.

The branches, or facilities, of the Bank of America and the Bank of Hawaii which operate in the Trust Territory generally do not make the kinds of loans necessary to support the purchase of capital equipment for commercial agriculture. Present policy prohibits using land as collateral for loans because land title (when title can be established at all) can only be acquired by Micronesians.

The land ownership policy and other policies have either restricted or prohibited foreign investments in the Trust Territory. But these restricted policies have been relaxed somewhat within the last year. The granting of charters to the Micronesian Hotel Corporation and the Micronesian Development Corporation (to build a hotel on Saipan, and a major cattle operation on Tinian) provided entry and long-term lease arrangements to corporations held largely by non-Micronesians. These two precedent setting instances appear to open the door to major new sources of capital for economic development in general, and for commercial agricultural enterprises in particular.

There is no question that foreign investment in the private economy of Micronesia must be made from sources outside the Trust Territory if the maximum development potential is to be realized. The only other way the needed equity capital could be provided would be through donations from the Trust Territory Government to select Micronesian individuals--certainly not a very likely prospect, nor a healthy way to attempt to build a strong and viable private sector of the economy. But the government will need to make economic development loans available and to guarantee some bank loans in order to supplement the small amounts of equity capital which some Micronesians now own, and to supplement the equity capital which outsiders may be willing to invest in Trust Territory private enterprises. Over-all programs for meeting the capital needs in agriculture and in the other sectors of the private economy of the Trust Territory will be presented in a subsequent part of this report.

The economic conditions existing in the Trust Territory, most notably the wage rate levels, point inexorably to the fact that feasible agricultural expansion must be increasingly capital intensive. Unless a rapid shift toward more capital intensive production can be achieved, and the sources of capital necessary

to support this shift induced to flow into the Trust Territory, any significant expansion in commercial agriculture will be out of the question.

EXISTING AND POTENTIAL MARKETS

The domestic market today is so limited and undeveloped as to be of little immediate significance. But in the longer run, the domestic market will grow as a result of population increases, shifts from a subsistence to an exchange economy, and general improvements in living standards. The greater immediate marketing opportunities are provided by the fact that the Trust Territory lies adjacent to Guam which imports almost all of her food, and on the edge of the vast Asian markets such as Japan and Hong Kong. The following sub-sections describe and evaluate the existing conditions and possibilities for marketing Trust Territory agricultural products in each of the most promising areas.

Local Markets

During 1965 the value of food consumed from all sources is estimated at about 13 million dollars. A breakdown of this estimate is presented in Table VII. The subsistence crop estimate

Table VII

Estimated Value of Food Consumed in the Trust Territory in Fiscal Year 1965

Description	Value
Subsistence Crops	9,000,000
Domestic Cash Crops (veg., poultry, livestock, etc.)	150,000
Imported Food Items	4,024,506
	13,174,500

1. Value of subsistence crops is conservatively estimated to be $100 per capita.
2. Value for domestic cash crops developed from recorded local sales, Marianas District, value for Yap, Palau, Truk, Ponape and Marshalls is estimated.
3. Imported food items include rice, flour, sugar, canned meat, canned fish, other food and beverages, taken from statistical appendices of the 18th Annual Report to the United Nations in the Administration of this Trust Territory of the Pacific Islands, July 1, 1964 to June 30, 1965.

of $100 per capita is probably conservative, even at prices prevailing locally. Prices of imported foods that might be substituted for the subsistence items might be two or three times as high. By 1974, the population is expected to number over 110,000 and the local wage earning labor force to be close to 20,000--more than twice the present size.

In fiscal year 1965, the value of food imports, including beverages, amounted to about $4 million. The value of food imports in 1965 showed a 30 percent increase over imports in the previous year. The types of items imported are shown in Table VIII. More than a third of the imported food items could be locally produced, given the proper circumstances and incentives.

Over the next twenty years the population of the Trust Territory is expected to at least double. By 1986 there will be a total demand for more than twice as much, for higher quality and a greater variety of foods. A much larger percentage of the total food consumed will be bought, rather than home grown. It is expected that by 1986 some 80 percent of the total value of food consumed will be bought in the market place, and that local expenditures for food and other agricultural commodities will amount to more than $25 million per year. This amount is extremely small by world market standards. But in the economic microcosm

Table VIII

Quantities of Selected Agricultural Commodities, Transshipped at Port of Guam, Destined for Trust Territory Ports[1/]

Commodities	Quantity
Bakery Products/Candies	110,118 lbs.
Beef, Frozen	34,611 lbs.
Beer	108,888 cas.
Chicken, Frozen	88,698 lbs.
Coffee/Tea	123,153 lbs.
Corn	1,762 lbs.
Dairy Products	188,907 lbs.
Eggs	1,120 cas.
Feeds	158,368 lbs.
Fish, canned	170,225 lbs.
Fish, frozen	14,478 lbs.
Fish, salted	2,644 lbs.
Flour	2,968,571 lbs.
Foodstuff	751,172 lbs.
Fruits, canned	91,062 lbs.
Fruits, fresh	58,067 crt.
Juice, canned	9,828 cas.
Liquor	10,000 cas.
Meat, canned	1,033,629 lbs.
Milk	26,794 cas.
Onions	73,139 lbs.
Pork, frozen	25,654 lbs.
Potatoes	11,784 lbs.
Rice	3,709,326 lbs.
Salad oil/shortening	335,139 lbs.
Salt	151,533 lbs.
Sausage, frozen	6,580 lbs.
Soft drinks	37,168 cas.
Soup, canned	1,356 cas.
Spices	13,038 lbs.
Sugar	1,070,657 lbs.
Vegetables, canned	103,294 lbs.
Vegetables, fresh	55,620 lbs.

1/ Sources: Commercial Port of Guam, Statistical Summary of Import, Export and Transshipments by commodity for Fiscal Year 1964

Note: Sizeable quantities of imported goods flow into the Territory without transshipment through Guam, but figures for these imports are not currently available.

of Micronesia where the land area, the resources, the number of people and the alternative economic opportunities are all very small, this projected $25 million provides a major opportunity for expansion in basic employment, income, and private enterprise activity.

Foreign Markets

Guam. Guam is the closest external market. It is located no more than 50 miles from the island of Rota in the Marianas, and the three major islands of Rota, Tinian and Saipan all lie less than 200 miles from Guam. This close proximity provides the Marianas District with a decided locational advantage in supplying Guam with fresh vegetables, fruits, meats, poultry, and other agricultural products.

Guam's total population is estimated at about 73,000 people, some two-thirds of whom are civilians. The other third are military personnel and their dependents. The complexities inherent in the Guam market are highlighted in the recent report on the economic development of the Territory of Guam, prepared by the Planning Research Corporation. Guam has three levels of civilian retail food markets. The military population has access both to military exchanges (where retail food prices do not

reflect all overhead and transportation costs) and to the civilian markets. The three classes of civilian markets are as follows: 1) several medium sized supermarkets and small village markets which try to maintain supplies of fresh (local or imported) produce; 2) many local village stores and the Guam Farmer's Market which handle small volumes of produce as available; and 3) an informal market channel from home gardens on Guam and from farmers on the neighboring islands of Saipan, Rota, and Tinian.

The military portion of the total population comprises a significant market for fresh agricultural products. To date, neither the Guamanians nor the Marianas farmers have been successful in capturing any sizeable portion of the military markets for a number of reasons: 1) a local producer must compete on a quality and price basis with products from the United States which do not include all normal commercial marketing costs in their prices; 2) the military market demands a dependable supply of uniformly high quality produce, a condition that local producers have not yet appreciated or been able to meet; and 3) the influence of the high Government wage scale in Guam, which has boosted the wage level and thereby rendered almost all commercial farming in Guam infeasible. These conditions have prevented the development

of specialized volume production to satisfy the Guam market requirements.

Although labor in the Marianas for agricultural occupations is already limited and rapidly becoming more so because of increasing alternative opportunities and an upward trend of government wages, the Guam market offers a profit incentive to potential agricultural enterprises. But only those enterprises which adopt modern labor saving techniques, high quality production, and efficient marketing techniques can profitably compete in this market.

Table IX shows the breakdown and quantities of net imports into Guam for selected agricultural products during the fiscal year 1964. It is anticipated that the Trust Territory Micronesian Development Corporation will, by 1970, be supplying a major portion of the beef consumed in Guam. When this corporation becomes fully operational its slaughter and packing plant located on Tinian will provide to other Trust Territory producers a marketing channel to Guam. It is certain that the same channel could be utilized to market Trust Territory-grown vegetables and fruit once local farmers achieve the capability to produce a regular supply of high quality produce.

Table IX

Net Imports into Guam, for Selected Agricultural Products, Fiscal Year 1964[1/]
(thousand pounds, except as otherwise specified)

Description	Imports (000 lbs.)
Corn	483
Onions	593
Potatoes	692
Vegetables	
canned	
fresh	1,010
Fruit	
canned	828
fresh	1,372
Juice, canned (thousand cases)	
Foodstuffs, unspecified	5,178
Foods	8,880
Poultry, frozen	1,477
Beef, frozen	3,264
Pork, frozen	2,327
Sausages, frozen	586
Meat, canned	1,130
Fish	
canned	386
frozen	479
salted	52
Eggs (thousand cases)	5

1/ Sources: Commercial Port and Guam Department of Commerce and Planning Research Corporation report.

The present population of Guam could provide a $2 million market for Trust Territory agricultural products. The only major problem appears to be that of achieving the required product quality, quantity, and dependability. Barring import restrictions on Trust Territory agricultural products it is very unlikely that Guamanian-based agricultural enterprises could compete with Trust Territory producers because of Guam's agricultural labor situation, which is much tighter than the present labor situation in the Trust Territory.

Hong Kong. In spite of its limited land area and almost complete lack of natural resources, Hong Kong supports a population of almost 4 million people. Hong Kong's highly developed manufacturing and trade activities provide the incomes necessary to support a very high demand for agricultural foodstuffs and raw materials. The total annual output of the Hong Kong economy is estimated to be close to $2 billion. All the agricultural products the Trust Territory could produce could be absorbed by the Hong Kong market without any noticeable effect on that market.

There are two factors which will inhibit the marketing of Trust Territory agricultural (and other) products in the Hong Kong market. One of the factors, the lack of regular shipping

between Trust Territory ports and Hong Kong may be overcome in the near future as the Micronesian Line is expected shortly to extend its routes to Formosa and Hong Kong on a trial basis. The much greater and more challenging obstacle, however, is the competitiveness of the market itself.

In recent years mainland China has exercised its comparative advantage of cheap labor and adjacent location to capture more than 25 percent of Hong Kong's total import market and perhaps as much as three-quarters of the import market for agricultural products. To be successful in the Hong Kong markets, Trust Territory products must discover types of products or parts of the year in which the competition from Communist China is not overwhelming. Only those Trust Territory products which are outside China's production capability, and products to be further processed into finished goods for export to the United States, can be profitably marketed in Hong Kong. (Hong Kong products which include any raw materials from Red China are denied entry into the United States.) Proper planning and market contacts can result in significant agricultural enterprise expansions based on products selected to meet the special opportunities offered by the Hong Kong markets.

Japan. Japan, with its more than 90 million people, is located only 1,300 miles north of Saipan. The Trust Territory's total production potential could be absorbed by the vast Japanese market without a perceptible effect on that market. Recent investigations have shown, however, that Japan now has quarantines on most agricultural commodities for which the Trust Territory has a production capability. Trust Territory products not included in the quarantines are green bananas, fresh coconuts, coconut palm heart, copra, dried manioc, and possibly a few other minor crops.

The Japanese markets are generally about as competitive as are the markets of Hong Kong. Access to the Japanese markets is only available to high quality produce shipped on a rather regular basis. Removal of the melon fly quarantine on produce grown on islands which are free of that insect, and development of the necessary marketing channels, could have a very favorable economic impact on the islands concerned. However, it is anticipated that even if negotiations for removal of this quarantine were to be initiated at this time, the quarantine could not be removed in less than two years.

Longer run prospects for marketing Trust Territory agricultural commodities in Japan are more promising. The expanding

population is forcing urban encroachment upon limited agricultural lands. Furthermore, increasing Japanese industry demands for labor and increasing wage rates are luring agricultural workers into the industrial sector. The limited size of individual agricultural land holdings limits mechanization. The Japanese will become more and more dependent upon food imports to meet their domestic requirements in the coming years.

United States. Geographic location, high freight rates and import tariffs place the Territory at a decided comparative disadvantage in marketing its products in the United States. Until some of these impediments are overcome, the U.S. markets will not offer any significant opportunities for the sale of agricultural products from Micronesia.

RECOMMENDATIONS AND SUGGESTED PROGRAMS

Many important opportunities for economic expansion in agriculture in the Trust Territory do exist. But without well planned efforts to induce and facilitate the potential enterprises, not much expansion is likely to occur. This section presents the policies, programs and activities necessary to take maximum advantage of expansion opportunities.

It is becoming increasingly evident that the Trust Territory Government must either initiate and pursue an aggressive policy of agricultural development, or prepare to accept the consequences of (a) losing that which is now the only major basic economic sector other than the Government; (b) becoming completely dependent on the United States, Japan, and other areas as sources of its food requirements; and (c) forfeiting the employment, income, and development opportunities for small, private enterprises which agriculture could provide.

Labor and Wage Policy. As the Trust Territory Government further increases its capital improvements and operations expenditures in accordance with present plans, the already tight local labor markets will become even tighter. Unless steps are taken to assure the availability of productive, reasonably-priced skilled, semi-skilled and unskilled agricultural labor, all chance for the expansion of commercial agriculture will disappear. In this respect, the administration should: (a) increase its efforts to encourage Micronesians to engage in agricultural activities giving special attention to the younger generations, especially to ensure that they are aware of the wide range of activities and opportunities which exist in the industry; and

(b) liberalize its immigration policy and then take positive steps to attract and recruit foreign nationals.

Because of the almost complete lack of modern machinery, fertilizers, insecticides, and techniques, agricultural productivity in the Trust Territory is very low, even as compared with the Philippines, Taiwan, Japan, and other parts of Asia. Efforts must be directed toward increasing indigenous agricultural productivity. Crops having the potential of high output value per man must progressively replace the crops having low value yields. The machete and hoe must, where possible, be replaced by the tractor and plow. Agricultural stations should be equipped both to demonstrate such machinery and to supply custom services to individual farmers on a rental basis. As an awareness of the rewards of using agricultural machinery becomes more widespread, individuals in localities having a good agricultural potential should be encouraged to buy equipment and to offer custom services to their neighbors.

The kinds of equipment needed for the agricultural stations will differ from district to district; total equipment outlay required per district will range from about $25,000 to perhaps as high as $90,000. The sizes and types of tractors,

cultivation, fertilizing, harvesting, and spraying equipment to be made available in each district will need to be determined by the special circumstances in each case.

The provision of the equipment, in each instance, must be tied in with a program for its proper use and maintenance. The Division of Agriculture must make sure that each district has personnel who can and will put the machinery to productive use to properly serve both the demonstration and the rental service objectives.

Land Use, Land Tenure, and Public Land Management. In the Trust Territory the total land area is limited to some 700 square miles; land which is suitable for production of agricultural commodities (with the exception of copra) probably amounts to less than 20 percent of the total area—less than 140 square miles or about 90,000 acres.

The problems of uncertainty as to length and type of tenure, titles, and property boundaries are about as serious as they were 20 years ago. These problems seriously impede healthy agricultural development, and are causing increasing discontent among the local people. Management of public lands has long been an issue of political contention. This is one of

the most critical, difficult, and immediate problems facing the administration.

Past practices of allocating lands for uses for which they have little potential, and of neglecting needed allocations, must be discontinued. Lands needed for future developmental use must be selected and protected. Unless attended to promptly, the land administration problem promises to be embarrassingly costly to the administration in terms of time, money, and unnecessary local dissatisfaction. The continuation of past and present land policies (or the lack of policies) would seriously interfere with rational programs for agricultural (and economic) development.

The Trust Territory Government should inform the people that the public lands belong to them and that these lands should be used only for the maximum benefit of all the people. Unless this is done, much of this valuable asset may be dissipated through land distributions for relatively unproductive uses that benefit the few. The land policies, programs, and practices of the Trust Territory Government will be a major determinant of the potential success of new and expanded agricultural enterprises in Micronesia.

Effective land policies and programs are needed not only to serve agriculture, but for all kinds of economic development

and for all administrative programs and services. Specific land policies and programs designed to serve the total needs, both for development and for government program support, will be presented in Part IV of this report.

Capital. Agricultural expansion in Micronesia requires that the present capital shortages be overcome. Private equity capital must be induced to come in from outside. Land ownership restrictions need to be changed so that land and buildings and other improvements can be used as collateral for loans. A program to provide supervised agricultural credit, assistance to applicants applying for loans, and supervision and management assistance to borrowers will be required. Government subsidies need to be provided to cover complete or partial costs of some types of land reclamation, rehabilitation, or other types of improvement.

The projected immediate capital needs in agriculture are presented in a subsequent sub-section of this chapter. The specific program recommendations for meeting the capital needs for economic development in all the sectors is presented in Part IV of this report.

Market Development

The inability of Micronesians to establish and maintain market channels, both internal and external, has been a major contributing factor to the lack of increased production in the Territory. While a newly established large enterprise with strong external affiliations may have pre-established markets for its products, most Micronesian agricultural enterprises lack the contacts, know-how, or resources needed to develop their own markets. They will need help, both in the provision of the infrastructure facilities necessary for efficient marketing, and in establishing the necessary marketing contacts and arrangements.

Market Channels and Facilities. In order to encourage new and expanding agricultural enterprises, the Administration needs to improve the basic communication, transportation and storage infrastructure necessary for expanded commerce in agricultural products. Most agricultural commodities are perishable; facilities need to be designed for the proper handling and storage of these perishable items, with capacities realistically related to demand and supply prospects.

Communications procedures and services need to be established and/or expanded and modernized to implement coordination

between the grower and the market-place, within districts, between district centers, and with external markets, particularly Guam.

Developing and Expanding Old Markets. It is recommended that the Administration establish, within its Division of Agriculture, a marketing assistance service, manned by a professional marketing specialist with experience in crop and livestock market development. This service should provide a broad range of marketing assistance, including coordination between market demands and production planning, crop reporting activities, and technical assistance in all phases of the marketing functions (harvesting, processing, storing, transporting, and selling).

Compliance with Quarantine Requirements. Quarantines now prevent the entry of many Trust Territory agricultural products into several of the most promising potential markets. Before quarantines can be removed, the insect or disease must be eradicated from the Trust Territory islands. Two of the serious pests--the melon fly and the oriental fruit fly--were successfully eradicated in the Northern Marianas, only to be recently reintroduced (apparently from Guam).

It is recommended that the Trust Territory Administration negotiate with Guam to establish and implement an effective program

for the simultaneous eradication of the melon fly and the oriental fruit fly throughout the Mariana Islands, including Guam. This would eliminate these pests, and simultaneously would eliminate the most likely source of mutual reinfestation. As soon as these insects have been eliminated, the Administration should, through the American Embassy in Japan, negotiate for removal of the melon fly quarantine by Japan. This objective must be achieved before the potential of developing a Japanese market for most Trust Territory agricultural products can be realized.

Education and Training

In order to facilitate the entrance of young people into the field of agriculture it will be necessary for the Government to use all available channels and means to educate the people regarding the wide range of employment and income opportunities available from modern agricultural enterprises. Unless this is done, the need for a strong agricultural sector, essential as the base for a more independent economy, probably will not be met, and the opportunities for productive employment in agriculture will be lost.

The Administration should take steps to expand and re-orient its program of agricultural training on all levels: junior and senior high school programs, farm institutes, college scholarship and Agriculture Division in-service training programs. Basic training in agricultural production and marketing methods should be provided for potential farmers; present or potential extension agents and others interested in careers in agriculture or related enterprises should be given advanced training in agricultural production, processing, and marketing. More scholarships for college training not only in the Philippines, but at United States colleges as well, should be provided. This will be necessary to develop Micronesian capabilities to the levels of competency required to manage efficiently the expanding agricultural enterprises and to lead the healthy development of this industry.

Research and Statistics

The lack of a program for organized data collection, analysis, and applied research in agriculture makes it impossible for Administration officials to assess or evaluate the past and present agricultural projects and activities of the Government, or even to analyze present production in the agricultural sector

of the economy. It is extremely difficult to plan a realistic over-all program for agricultural development in the absence of knowledge about the activities, conditions, progress, trials, successes, and failures of the past and present.

An indispensable part of the total effort for agricultural development is a continuing program for information and data gathering and analysis. Data on agricultural production, exports, and imports are essential for determining domestic market conditions and potentials, and for sound planning of agricultural programs and projects. Information and data on production costs, both in the private sector and especially on the various Government pilot projects, are essential (a) to determine feasibilities, (b) to make informed decisions regarding possible areas for expansion, and (c) to assess the total production cost spectrum looking to the possibility of cost reductions. Information on existing and projected market conditions--especially supply, demand, and prices for actual and potential Trust Territory products--needs to be constantly gathered and reviewed, both for the world market in general, and for the most important markets for Trust Territory products, in particular.

The Government's agricultural expansion effort needs to be constantly reassessed and redirected. Only with a continuing program of information and data collection and analysis (as recommended here) can this be effectively done.

ADMINISTRATIVE ORGANIZATION AND PERSONNEL

At present the Agriculture Division is decentralized with only three U.S. and two Micronesian professionals at Headquarters. Including vacancies there is provision for 19 U.S. and 252 Micronesian professionals on the field staff. While considerable decentralization is desirable, the present arrangement is weak in two respects. There is inadequate provision for planning, programming and coordination of agricultural activities and there is inadequate coverage of the range of specialized subject matter fields to carry out a comprehensive agricultural development program.

To meet these shortcomings while limiting the professional staff to the minimum essential size, it is proposed that the Division of Agriculture Headquarters staff be organized somewhat as follows. The director would have a program assistant and there would be three principal sections; Agricultural Stations and Projects, Extension and Education, and Specialist Services.

Agricultural Stations and Projects

Most of the work of research and development presently

is carried on at stations located in the districts. It would be desirable to have an officer at Headquarters who would coordinate the programs of work carried on at these stations. This coordination would include supervision of the preparation of work programs and budget proposals, continuing review of work in progress and coordination with other agricultural and closely related programs.

Extension and Education

This section would be responsible for the operation of a "Farm Institute" which would train extension personnel and supervise the planning and operation of extension activities. This section would also be responsible for providing assistance to vocational agricultural programs in the public and private schools and would have a voice in the choice of candidates for agricultural college scholarships. The Institute would maintain and operate a farm for demonstration and instruction purposes. The staff would include an agricultural education specialist, a farm management specialist, and an agricultural engineer.

Specialist Services

The proposed agricultural development program will require the services of a considerable number of different specialists. Most of the projects and programs, however, will be too small to

justify full-time staffs with the specialization needed. Therefore, it is proposed to attach a group of specialists to the Headquarters Division of Agriculture from which they would be assigned as needed to the various agricultural programs and projects throughout the Territory.

The fields that might be covered are economics and marketing, which would include assembling and disseminating statistical information. There would be a livestock unit including veterinary and livestock production specialists, a crop unit including an agronomist, an entomologist, and a plant pathologist. A forestry and conservation unit may also be desirable.

The above is about the minimum Headquarters staff organization that seems necessary to cover the important subject matter fields and provide the consistent programming and coordination of the agricultural work of the Trust Territory Government.

District Agricultural Personnel Functions

Each district will carry out the Headquarters service and section functions mentioned above as directed by the Headquarters staff and determined by environmental conditions and resource potentials within the district. Although personnel requirements will vary from district to district, agriculture

stations operations within each district should be directed by a resident senior agriculturist having a wide range of tropical experience. Other personnel requirements will be determined by special conditions and projects undertaken.

The above mentioned personnel recommendations are directed toward positions which would initially be filled by American professional staff. No specific recommendations have been made concerning the number and kind of Micronesian support staff which would be required for implementing recommended programs.

Recommendations for Obtaining Capable Personnel. The Trust Territory Division of Agriculture is presently facing personnel problems which are so serious as to threaten the success of existing programs. Some immediate policy decisions on personnel qualifications and recruiting practices are needed. The Agriculture Division has encountered great difficulty in filling existing positions with qualified personnel. The problems seem to have resulted primarily from the following three factors:

(1) The lack of an adequate personnel procurement channel to fill the needs required by the agricultural division. The type of agriculturist having the qualities and experience required will have job and promising career opportunities available

to him now, not only in Hawaii or the mainland United States, but in other parts of the world. Few of them will be actually seeking jobs.

(2) The junior grade ratings assigned to agricultural positions. Several of the agricultural positions carry the responsibility to devise and implement agricultural programs, and should be filled by persons having technical background and practical experience in both tropical crop production and agricultural development programs in underdeveloped areas. Because of the tight market for people with the required training and experience, the present position ratings of the Trust Territory are inadequate to attract the needed specialists.

(3) The lack of professional career opportunities for agriculturists employed by Trust Territory. The Trust Territory agriculturist has no affiliation outside the Trust Territory to enable him to continue a career with the incentives of acquiring some variety of experience which will contribute to professional advancement.

In the past, many agricultural programs have been slowed down or completely stopped while the American junior grade agriculturists familiarized themselves with tropical crop production,

learning from inadequately trained Micronesian extension agents and others to whom the American agriculturists were supposed to be providing direction, leadership, and advice. Primarily as a result of these personnel conditions, many aspects of the Trust Territory agricultural programs are ineffective, and the local farmers often appear to have little confidence either in the program or in the advice of the American agriculturists.

It will be next to impossible for the Division of Agriculture to carry out successfully the programs which have been outlined above unless a solution to these personnel problems can be found. The following paragraphs offer a possible solution which would tackle the three facets of the problem.

A few years ago the United States Department of Agriculture, partly as a result of increasing demand for agriculturists having experience in tropical and other developing foreign areas, established the International Agricultural Development Service. Now it appears that the resources and personnel of I.A.D.S. might be available to meet the needs of the Trust Territory.

The I.A.D.S. might offer the advantages of 1) providing specialists from its own staff or through its specialized recruiting channels; 2) supplying senior agricultural specialists with

experience in tropical agriculture in developing areas; 3) providing career service opportunities to specialists; and 4) supplying technical back-up and research assistance to carry programs to successful completion.

Specifically, it is recommended that the Trust Territory Administration contact the I.A.D.S. to investigate the possibility and desirability of entering into an agreement to provide personnel to fill all the professional positions to be filled by Americans in the Division of Agriculture. Such an arrangement would not require a complete change of personnel, since I.A.D.S. would almost certainly be interested in employing qualified persons currently on the Trust Territory staff. Employment by I.A.D.S. would enable qualified Trust Territory employees to become career professionals with permanent status, and with world-wide job opportunities.

Expansion Potentials and Resource Requirements for Agriculture

Previous sections have described in detail the need for capital, the scarcity of and need for agricultural labor, the presently low labor productivity in agriculture, the scarcity of arable lands, the extent of existing markets, and other aspects

of the base for agricultural expansion in the Trust Territory. This final section presents specific estimates of the expansion potential in each of the products which appear most promising, including livestock, fresh vegetables, bananas, other tropical fruits, rice, and pepper; and presents estimates of the resource requirements to support these potential expansions over the next five years.

The projections presented here are formulated on the assumption that the Trust Territory Government will recognize the important potential of commercial agriculture, and will pursue vigorous programs for agricultural development as recommended in the previous section of this chapter. These projections also assume that the policy and program recommendations presented in Parts I, III, and IV of this report will be accepted and successfully implemented. The estimates of returns to capital and labor can only be achieved with highly competent management. Experienced managers, supervisors and even skilled workers must be attracted to the Territory in order to establish enterprises and reach the standards of operating efficiency that have been assumed.

Some of the land and much of the capital and labor needed for agricultural expansion can be provided by private individuals

and enterprises. Yet the task of gathering, preparing, and/or providing a part of each of these resource needs will have to be performed by the Government. Some of the capital requirements will represent infrastructure needs, such as access roads, warehousing, storage, and transportation facilities.

The resource requirements presented in the following sub-sections do not distinguish between those assets which the Government will need to provide and those which should be provided by private enterprises. The size of the Government's share of the task will be largely determined by 1) the degree of emphasis which the Government choses to devote to agricultural expansion, and 2) the extent to which Government policies and programs facilitate the entry of outside management, capital, and labor to meet the resource needs.

Livestock

Beef and Pork. The largest expansions in livestock and pork production during the next five years are likely to be those already underway on Tinian and Saipan. These enterprises, for the fulfillment of their expansion potential over the next five years, will require a total land area of about 20,000 acres, a

total labor force of some 100 workers, and capital investment of about $3,000,000. In addition, potential expansion in smaller beef producing enterprises will require about 1,000 acres of land, 20 workers, and $100,000 in capital investment. The total value of beef and pork produced for market if the potential expansions are realized can amount to more than $1,000,000 per year by 1972, as compared with a figure of no more than $20,000 today.

Because of land limitations, most of the expansion in marketable beef and pork production should be centered in the Marianas District, with some small expansions possible in Ponape and Palau.

Dairy. A small dairy industry in the Territory could well provide fresh dairy products (primarily fluid milk) to meet the increasing demand for such products. A combined production processing and marketing enterprise with about 250 cows would be economically feasible, and its output, mainly fluid milk, could readily be absorbed by the Guam-Marianas market. Such an enterprise will require a total land area of about 500 acres, will employ a labor force of some 20 workers and will require a capital investment of approximately $400,000. A total market value of

milk produced should amount to more than $300,000 per year within a five-year period.

Building such an industry from the ground up would probably be best accomplished by a U.S. firm with broad experience in the production, processing and marketing of fluid milk and other dairy products. A second alternative would be for the government to develop a 100-head integrated enterprise on a pilot-project base, which would later be sold to a private firm or individuals.

Because of product perishability and land requirements the dairy industry could best be located in the Marianas District. To achieve economies in processing and marketing the dairy project should be limited to developing a single processing and marketing enterprise integrated with a single production unit that would provide a major part of its milk supply at the outset. Small operators could sell raw milk to the dairy, and supplies from such sources could be expanded with growth of the market and inspection services to maintain health and sanitary standards in the small milk producing enterprises.

Poultry. Although a number of small poultry producers are now increasing production, their costs are high due to the small scale of their operations. The aggregate demand in the

Trust Territory and Guam markets would support one or two large poultry enterprises which would have a total scale of operation of approximately 30,000 birds. The land requirements for such enterprises would be negligible, if all feed were imported. The total labor requirements would amount to approximately 10 persons, and a capital investment of approximately $200,000 would be required. Such an enterprise should be located in the Marianas District where there is greater access to poultry feed and other necessary supplies at lower costs, and more frequent shipping services.

With the increase in inter-district shipping, smaller 1,000 to 2,000 bird poultry enterprises in other district centers are becoming feasible. However, additional handling and shipping costs of feed and supplies will cause production costs in other district centers to be greater. Poultry markets in the other district centers can be served by shipments from the Marianas if local interest in other districts does not materialize. The decrease in air freight fares makes feasible air shipment of fresh eggs from the Marianas to almost every other district. The total value product which can be expected from the suggested poultry industry expansion could amount to more than $400,000 per year.

Vegetables

There is a pressing demand both on Guam and throughout the Trust Territory for vegetables such as corn, tomatoes, egg-plant, melons, green vegetables, and root crops. Expansions which now appear to be feasible would require about 1,000 acres of land, would employ between 50 and 100 persons depending upon the degree of mechanization, and would require an investment of approximately $500,000.

Commercial scale enterprises would range in size from 100 to 500 acre units and would be located primarily in the Marianas District, where the relatively large areas of gently sloping arable land permit maximum mechanization. A total expansion effort in the production and marketing of fresh vegetables should produce an annual product valued in excess of $1,000,000 per year by 1972.

Fruit (Commercial Production)

Citrus. Developing the number and area of citrus groves needed to meet current market demands will require a total land area of approximately 500 acres, will employ approximately 50 workers, and will require a capital investment of approximately $200,000. Initial analyses indicate that the minimum economic

unit would cover an area of approximately 10 acres. Although citrus fruits will grow in most areas of the Trust Territory, production should be concentrated in one or two districts to provide a scale of operation necessary to justify facilities for cooperative pre-market processing and packing.

Pineapple. At the present time there is no pineapple grown either of marketable quality, or on a commercial scale. Development of pineapple production on a commercial basis would be related to Guam and local market demands for fresh pineapple and thus would be limited in scale.

The recommended expansion would involve the development of 150 acres of land, would employ approximately 30 workers and would require an initial investment of approximately $100,000. Ponape, Palau, Truk or Yap would be the most ideal locations for pineapple production since the acid soils which are required are found in those districts. The minimum size economic unit would be about 5 acres. The value of production should exceed $150,000 per year.

Bananas. Commercial production of bananas would be largely directed toward the Guam and Japanese markets since at the present time most local demand is met through production

from the subsistence sector. Production of bananas for export requires a high quality product at the time of delivery to the foreign market. This requirement necessitates special handling and shipping facilities which can only be justified with high volume production.

The development of commercial scale banana production will require a total land area of approximately 3,000 acres, will employ up to 250 workers, and will require a capital investment of close to $3 million.

The banana industry could best be developed by a firm well experienced in banana production and marketing. Ideally, such a firm would demonstrate production of bananas on a leased area of approximately 1,000 acres, and would supply technical assistance and a market for the output of smaller, local producers in adjacent areas covering an area of approximately 2,000 acres. Total commercial plantings should be located in one district, preferably on one island, to minimize costs of production and handling losses.

Although bananas could be grown in the Marianas District, it is likely that either the Ponape, Palau, or Truk District would be more suitable due to the lower probability of losses from occasional typhoons. Such an industry, once established, should have an annual value product of close to $3 million.

Assorted Tropical Fruits. Local market demand exists for assorted tropical fruits of marketable quality, such as avocado, mango, starapple, and others. Possible expansions would require a total land area of approximately 500 acres, a labor force of approximately 50 workers and a capital investment of some $200,000.

Once the plantings have reached mature bearing age, it is expected that the annual production from 500 acres would be valued at close to $500,000. The minimum economic unit for this type of production would be 10 acres. Such enterprises should be located on major islands or district centers to facilitiate marketing.

Other Cash Crops

Rice. Efforts to establish rice production in the Territory are still in the experimental stage, yet present results appear sufficiently favorable to plan tentatively for the development of commercial rice production.

There are now 10 to 15 acres in rice production. The potential expansion over the next five-year period would require some 1,000 acres of paddy land, between 100 and 500 workers depending upon the degree of mechanization, and an investment approaching $1 million. The water, land and labor resource

conditions identify Ponape Island as the best location for the initial development project.

As the next step in the rice industry expansion effort, the Trust Territory Government should contract the development of a 100-acre pilot-project to a firm with experience in overseas agricultural project development design and management. The contracting firm should develop and demonstrate a capital intensive, low-cost method of production for rice to fit the special conditions existing in Ponape. The successful development of the initial project should lead to a contract renewal for development of an additional 900 acres. The production from the most efficient cultivation of 1,000 acres of paddy land can be expected to produce about one-half of the total annual rice needs of the Territory, or a total value product of about $500,000.

Pepper. Pepper production in the Trust Territory is just beginning to emerge from the experimental stages. At the present time there is one experimental acre in production and 5 acres have been planted. The expansion which appears to be potentially feasible will require a total land area of 50 acres, a labor force of some 50 workers, and a capital investment of approximately $50,000. Production would be limited to Ponape Island where the processing facility is located.

Pepper production is labor intensive, and the feasibility of this crop will not be assured until either a premium price has been clearly established, or labor productivity in pepper production has been increased. A concerted effort should be made to resolve such questions so that an early decision can be made as to whether to continue this project.

Summary of Resource Needs

The table below provides a summary presentation of the estimates of resource needs for agricultural development and expansion over the next five years. Exploiting the opportunities to the level of the estimated potential, as indicated in the table, should generate an annual gross income of about $8 million by 1972.

Labor. Of the close to 1,200 persons shown as required in the table, at least one-fourth will have to be brought in from the outside to provide the technical competence and management now lacking in the present labor force. The importation of limited numbers of unskilled agricultural laborers may also be necessary.

Land. It is possible that a large portion of the close to 30,000 acres needed may be obtained from the Trust Territory

Government on a lease arrangement. However, development efforts in some districts will face both present day and traditional problems concerning land tenure and acquisition in attempts to acquire contiguous areas to meet minimum size economic unit requirements.

Capital. It is estimated that a capital investment of approximately $9 million will be required to exploit the existing opportunities as outlined above. Even though most of these opportunities are directed toward private enterprise expansions, it is likely that the Government will have to provide, lend, subsidize, and/or guarantee the major portion of the capital requirements. The Government will probably also be required to finance and operate one or two of the enterprises on a pilot-project basis in order to establish feasibilities and to draw outside investors into the area.

In addition to the capital requirements for private enterprise development, expanding government agricultural division programs will require close to $1,000,000 for new equipment and construction during the next five-year period. Since present activity in the subsistence area is declining, government program efforts need actively to promote commercial production to fill the gap. It is estimated that the Trust Territory local market

demand for agricultural commodities will exceed $24 million per year within the next twenty years. It is important that local production be expanded to fill as large a portion of that demand as possible and feasible. Additional recommendations for meeting the resource needs for agricultural and other sector expansions are presented in Parts III and IV of this report.

CHAPTER II

THE COPRA INDUSTRY

In the tropics the coconut palm is known as the tree of life. It has provided water, food, clothing, shelter, and fibers for as far in the past as man can remember. It has been the mainstay in the tropical subsistence way of life.

HISTORICAL DEVELOPMENT

To a great degree Micronesia has been throughout the past and is today what it is because of the coconut palm. Without palm trees many of the presently inhabited islands would be barren and the early Europeans would have had no interest in developing trade in the area. This section presents a brief review of the early and recent developments in the coconut and copra industry.

The German Period

Previous sections of this report have discussed the rise of the copra trade during the 1800's and have mentioned the important role of the German traders. This section continues that discussion to show the development of the present day copra industry.

Table X

Resource Needs for Agricultural Expansions

Recommended Product	Recommended Size of Expansion	Requirements Land (Acres)	Labor* (Persons)	Capital ($000)	Recommended Location District
Livestock					
beef	10,000 head (includes Micro. Dev. Corp. Ranch expansion)	20,000	100	3,000	Marianas
"	small-scale production	1,000	20	100	Ponape & Palau
dairy	100-250 head	100-500	10-20	400	Marianas
poultry	30 thousand birds 1 or 2 large enterprises	neg.	10	200	Marianas
"	1000-2000 bird enterprises	neg.	6	40	Other district centers
		21,500	156	3,740	
Vegetables (mixed to include: corn, tomatoes, eggplant, melons, green vegetables, and root crops)	200-500 acre units	1,000	50-100	500	Marianas
	up to 50 acres	250	25- 50	125	Other district centers
		1,250	75-150	625	
Fruit (orchard production)					
citrus min. econ. unit 10 acres		500	50	200	All districts
pineapple min. econ. unit 5 acres		150	30	100	Ponape, Palau, Truk or Yap
bananas min. econ. unit 15 acres		3,000	250	3,000	Ponape, Marianas, Palau or Truk (tota. commer-
assorted tropical fruits		500	50	200	cial plantings in one
		4,150	380	3,500	district)
Other Cash Crops					
rice	commercial production	1,000	100-500	1,000	Ponape
pepper**	200 100-vine contracts	50	50	50	Ponape
		27,950	1,236	8,915	

Note: *Labor is listed in man-years (2,080 hrs/yr); or persons required to work full time, where ranges are shown requirement would depend upon the degree of mechanization.
**Feasibility questionable.

In 1887, the major German trading companies amalgamated, forming the Jaluit Company, and thereby began to dominate the copra industry. They managed through bribery, coercion and exploitation of the feudal politico-cultural system to raise copra production in the Marshalls to between three and four thousand tons per year.

Although the Japanese tried to edge into the trade in the latter 1800's, they were unsuccessful. All Japanese firms had been barred from the area by 1901. International pressures forced the German Government to break the Jaluit Company's monopoly position in 1905, whereupon the Japanese returned and formed, in 1907, the Nanyo Boeki Kaisha (NBK--the South Seas Trading Company), which was a consolidation of some firms which had been in the area previously.

The German success is largely attributed to their utilizing the Marshallese political structure to their own advantage. The people were accustomed to paying one-half of what they produced to the chief of the clan whose land they used. The chiefs encouraged copra production and became rich.

Under the German system copra produced during the first half of a year went to the chief, while that produced during the latter half went to the producers. Two-thirds of the total

production collected by the chief during the first six months of each year was paid to the German Administration as a copra tax and used to defray a major portion of their administrative costs. In the Carolines as in the Marshalls, the Germans encouraged coconut growing and copra production and trained the Micronesians in selecting better seednuts and in spacing their plantings.

The Japanese Period

When the Japanese took over the islands from the Germans in 1914 they ousted the German traders and proceeded very diligently to build upon the base left by Germans, allowing NBK to take over what remained of the monopoly position of the Jaluit Company.

Initially the Japanese retained the German system of copra levies in the Marshalls. This was later modified to the advantage of the Japanese Administration. They increased the amount of the copra tax which they collected from the chiefs.

Table I illustrates the significant expansion of coconut acreages in all districts except the Marianas during the Japanese Administration. The nearly 2,000 acre decline in the Saipan District highlights the priority given to sugar production in that area and explains why copra production declined in the Marianas during the Japanese period.

TABLE I

Area of Coconut Palm Groves During 1923 and 1938

(by district, in acres)

District	1923	1938
Saipan	8,845	6,901
Palau	1,847	4,876
Yap	6,721	7,725
Truk	8,304	10,468
Ponape	11,774	18,730
Jaluit (Marshall)	25,644	29,901
TOTAL	63,134	78,501

SOURCE: Copra Industry in the Trust Territory of the Pacific Islands, 1953. Ag. Div. Files, Trust Territory Headquarters.

The Japanese paid subsidies for planting, thinning, weeding, and erecting copra dryers. They established fairly rigid regulations concerning the examination of copra for export, and to quite an extent were responsible for the very favorable reputation of "Micronesian sun dried" copra which has carried over into the present period.

A rather disorganized (small holder) subsistence pattern of coconut production still persists; some plantations were established both before or during the Japanese Administration. NBK leased land and established and operated the 2500-acre plantation at Metalanim on Ponape Island. A few smaller plantations were established in other areas.

As production levels increased, the sun drying technique introduced by the Germans became inadequate to handle the increasing volume, especially in the high rainfall areas. The Japanese promoted the use of an enclosed, fire-heated dryer which had been developed in the Gilbert Islands.

Through their vigorous and continuous copra expansion program the Japanese succeeded in raising production from some 5,000 tons in 1900 to more than 14,000 tons during the latter 1930's.

Wartime Collapse and Post-War Restoration

The great impact of World War II on the coconut industry is shown in Table II. For the year 1937 Japanese Administrators reported copra production at some 17,000 tons, an all-time high. Although the figure of 14,620 tons in 1938 is the last reported by the Japanese, copra production continued at least until the shipping and trade channels were disrupted by World War II.

During the War maintenance of the coconut groves ceased. Weeds and brush were allowed to take over. Falling coconuts were allowed to sprout and grow. The heavy growth significantly reduced the productive capability of the some 70,000 acres of palm groves throughout Micronesia. During the War some productive palms were cut down to obtain the heart of palm for food.

Following the War the United States Commercial Company began to revive the copra industry and to re-establish trade. The United States Commercial Company provided technical assistance to local producers, encouraged production, and performed the marketing function. In 1948 (while the Territory was administered by the Navy), the Island Trading Company was created as an instrumentality of the Trust Territory Government and assumed the copra buying and marketing functions. In 1950, the Copra Stabilization Board was formed as an instrumentality of the High Commissioner and given

their wishes and views;

(d) formulate recommendations as to the future political ...us of the Trust Territory and the procedure required to achieve that status; and

(e) submit a report containing such recommendations to the President of the United States, the Congress of the United States, and the Congress of Micronesia, no later than June 30, 1968.

Powers of the Commission

SEC. 6. (a) The Commission or, on authorization of the Commission, any committee of two or more members, at least one of whom shall be a member of the Congress of Micronesia, may, for the purpose of carrying out the provisions of this Act, hold such hearings and sit and act at such times and places as the Commission or such authorized committee may deem advisable.

(b) The Commission is authorized to obtain from any department, agency, or instrumentality of the Executive Branch of the Government of the United States any information it deems necessary to carry out its functions under this Act, and each such department, agency, and instrumentality is authorized to furnish such information to the Commission upon request made by the Chairman or the Vice Chairman when acting as Chairman.

Appropriations and Personnel

SEC. 7. (a) There are hereby authorized to be appropriated such sums, but not more than $150,000, as may be necessary to carry out the

provisions of this Act, and such moneys as may be appropriated shall be available to the Commission until expended.

(b) The Commission is authorized to appoint and fix the compensation of an Executive Secretary and such other additional personnel as may be necessary to enable the Commission to carry out its functions, without regard to the civil service laws, rules, and regulations, but any Federal employee subject to those laws, rules, and regulations, who may be detailed to the Commission (which detail is hereby authorized) shall retain his civil service status without interruption or loss of status or privilege.

TABLE 11

Copra Production - Trust Territory Area[1/]

Year	Short Tons	Export Value (U.S. Dollars)	Average Price/Ton Paid to Producers (U.S. Dollars)
1900	5,150		
1937	17,000		
1947	5,000 (estimated)		
1948	7,811	739,964	
1949	8,002	747,428	
1950	9,720	782,043	
1951	11,606	1,269,462	
1952	11,159	1,173,606	74
1953	10,680	1,054,763	100
1954	10,475	1,070,718	110
1955	12,372	1,334,414	100
1956	12,287	1,258,909	110
1957	13,588	1,487,847	110
1958	13,259	1,423,252	125
1959	9,345	967,771	140
1960	10,717	1,587,767	100
1961	13,949	1,779,866	100
1962	12,521	1,661,732	90
1963	12,817	1,922,400	90
1964	13,828	2,295,448	95
1965	13,718	2,525,117	
1966	13,804		

1/ Sources: The Coconut in Micronesia. Ag. Ext. Cir. #3. Copra Industry in the Trust Territory of the Pacific Islands, 1953. Economic Development Files. OPNAV. 13-17. Agriculture in Japanese Mandated Islands. Copra export file fiscal year 1966 - Trust Territory Pacific Islands, Economic Development Division.

the responsibility of marketing copra and administering the Copra Stabilization Fund which was created from sales of copra and used to stabilize the price paid to the producers.

PRESENT STATE OF THE INDUSTRY

Economic Importance

The uses of the coconut palm and its products are many. Coconuts can provide a refreshing drink and in some areas coconut milk provides the only potable liquid at some times during the dry season. Fresh coconut milk is used for cooking food and copra can be pressed to extract oil; the sap or fluid from the tapped coconut palm provides the natives with a coconut beverage which when fresh can be consumed by babies, and when fermented provides an alcoholic drink (tuba). Old palm trunks are used as timbers in crude forms of construction, while the leaves or fronds, may be used for thatching or basketry. The fiber from the coconut husk (coir) provides the raw material for cordage. Fresh coconut meat can be eaten and is also used as poultry and hog feed.

For well over a century, the coconut and copra industry has provided the people of Micronesia with a major source of income for the purchase of imported goods. It is estimated that more than 70 percent of the people of Micronesia are almost wholly dependent upon the coconut for their livelihood. In addition to

meeting the basic food and fiber needs described above, copra provides the cash to obtain trade staples such as rice, flour, cloth, nails, corrugated sheet metal, and other items which are now considered to be necessities in Micronesia. Although many local people neglect their coconut groves, they look upon each coconut tree as a form of insurance which will provide subsistence in times of need.

Most basic services (health, education, transportation, etc.) are being supplied by the Government throughout Micronesia. The copra industry helps to offset some of the costs of some of these services. For example, copra exporting has contributed almost a quarter of a million dollars towards the total annual shipping expenses of the Territory. Over each of the past 15 years (except 1959) the copra industry has produced a product valued in excess of a million dollars. In both 1965 and 1966 the value of the copra export exceeded $2.5 million. Copra has been and continues to be the leading export product. It accounted for 80 percent of the value of all commodities exported from the Territory during fiscal year 1965.

Production and Marketing Methods

Harvesting. In Micronesia copra is usually made from coconuts which have ripened and fallen from the tree. Ripe coconuts are picked before they fall only rarely, when copra

drying can be speeded by spreading the fresh copra on pavement or metal surfaces which concentrate the heat. Well processed sun dried copra can be used to produce edible oils and therefore may command premium prices. Other drying techniques are required in order to produce greater quantities of good grade copra, especially where or when rainfall is frequent and heavy.

The Japanese introduced into the Marshalls a natural draft hot air dryer which had been developed in the nearby Gilbert Islands. This dryer was later modified and introduced in Truk and Ponape where it is now widely used. Although the American Administration introduced it into the Western Carolines and the Marianas it has not yet been widely used in these areas. This dryer, now known as the Marshallese dryer, is made of corrugated iron sheets and uses oil drums as its furnace. The copra is spread in trays which are placed on racks in the dryer. Heat from the furnace circulates up through the trays and finally escapes through openings around the eaves of the roof. Coconut shells are generally used for fuel. When the Marshallese dryer is properly constructed and maintained it can produce an excellent grade of copra in two days, regardless of weather conditions.

The Ceylon dryer, introduced in the Trust Territory in 1955, dries the coconut meat in the half shell, thereby eliminating the labor required to strip the meat from the shell before drying. The meat separates itself from the shell during the drying process. The problems associated with the Ceylon dryer are that it is more difficult to load, it deteriorates rapidly, and the time required for drying is longer. Very few Ceylon dryers are used in the Trust Territory.

Grading. Although the Trust Territory Administration has not established any official copra grade standards, there are three distinct grades which are recognized in the trade.[1/] These are listed below.

Grade 1 -Copra must be in medium sized pieces (not cut in fine strips); it must be of mature, nongerminated kernels; it must be white and have a fresh odor; it must be dried down to approximately 5 percent moisture content (this is estimated by observing the "water line" in the pieces of copra and by the crispness which increases with dryness); no extraneous materials such as pieces of shells, sand, grass, etc., may be included.

Grade 2 -Same as above except that pieces may be slightly smaller; color is darker from excessive heating or delayed drying; slight rancid odor; moisture no more than 6 percent; some copra from germinated nuts; slight contamination with extraneous materials.

1/ Copra Production in Micronesia by M. Sproat.

Grade 3 -Same as Grade 2 except greater quantities of copra from germinated nuts; color dark brown from scorching, mold action or soil contamination; odor is slightly rancid; moisture not more than 7 percent; some copra from young nuts; some contamination from sand, dirt, grass or shell.

Copra which does not meet the minimum standard for Grade 3 is supposed to be rejected by the copra buyers as being unsuitable for export.

Marketing. The Trust Territory Copra Marketing Board is the official buyer and exporter of copra in the Territory. The Board operates through an agent who buys copra for the Board through buyers licensed by the Board. Field trip vessels carry the licensed copra grader-buyer from the district center to the outer islands where the copra is graded and bought from the out-island producers. The price paid to the producers is set by the Copra Stabilization Board, and in recent years has ranged between $100 and $132 per ton for Grade 1. The price set for Grade 2 is $10 less than for Grade 1, and a similar differential exists between Grade 2 and 3.

Out-island producers receive $12.50 less per ton than the official district center price. This differential is supposed to cover all the costs associated with purchasing and shipping the copra to the district center warehouse.

All the copra produced in Micronesia is sold on the world market by an agent designated by and responsible to the Copra Stabilization Board. The agent is completely responsible for purchasing, transporting, warehousing, protecting, exporting, selling, and delivering the copra in good condition to the buyer. He is also responsible for collecting the payment for each shipment. Several thousand-ton lots are shipped approximately monthly, usually to Japan. In rare instances, when justified by price differentials, Trust Territory copra is sold and shipped to processors on the West Coast of the United States and Canada.

Trust Territory copra is shipped in bulk from the district centers to the foreign port of delivery. By marketing all copra produced in the Trust Territory through one agent, shipping and other marketing costs have been reduced.

Levels of Production and Coconut Acreage

Production. Table II (page 7, above) lists Trust Territory copra production for 1947 and for each following year. Although there have been fluctuations in the amount produced from year to year, increases in production were relatively steady from 1947 through 1958. In 1959 there was a decline of more than 30 percent

from the previous year because of typhoon damage in late 1957 and early 1958. From 1959 to 1964 production generally continued to rise. Since 1964 the annual rate of production has stabilized at about 13,000 to 14,000 tons.

Table III compares copra production in the various districts during the past two years. In the Marianas District production was almost 50 percent greater than during the previous year. This was largely due to typhoon Carmen which devastated a few of the northern islands and brought about a flurry of copra making.

The cause of the more than 40 percent increase in production in 1966 over 1965 for the Yap District is uncertain. It is possible that the availability of a wide range of trade goods is beginning to stimulate increased production. Production in the Palau District was slightly less in 1966 than in 1965. Truk District showed an increase of approximately 10 percent in 1966.

The Ponape output declined in 1966, for the fifth consecutive year. Production in 1966 was almost 500 tons less than in 1965, a decrease of some 15 percent. The Trust Territory Division of Agriculture is now taking steps to try to find the reasons for the consistent decline in copra production in Ponape. The increase in alternative employment opportunities is thought to be a contributing factor.

TABLE III

Copra
Production by Districts
Fiscal Years 1965 and 1966[1/]

District	1965	1966	Difference
Marshalls	5,806	5,554	-252
Truk	2,840	3,092	+252
Ponape	3,219	2,732	-487
Yap	817	1,152	+335
Saipan	458	722	+264
Palau	578	552	- 26
TOTAL	13,718	13,804	+ 86

1/ Trust Territory Economic Development files

In the Marshalls District, which produces almost as much copra as all other districts combined, total output declined very slightly in 1966.

Coconut Grove Acreage. Table IV lists the estimated acreages, by district, as reported in recent annual reports to the United Nations. The total acreage figure increased from some 90,000 in 1961 to more than 150,000 in 1963, then decreased to 72,000 in 1964. The changes in these figures from year to year may be due in part at least to the serious lack of systematic collection and processing of the data.

Coconut acreage can be estimated on the basis of what is known about exports, domestic consumption and yields per acre. The average grove in the Trust Territory produces less than one-half ton per acre. Assuming an average annual yield of one-half ton per acre, and allowing for domestic consumption, it could be estimated that between 50,000 and 60,000 acres of producing, harvested palm groves now exist in the Trust Territory. There are, however, many groves with palms approaching senility, the too thickly planted areas where yields per acre are very low, and the scattered areas where coconuts are not harvested. Allowing for these areas of low production, it appears that total Trust Territory acreage of coconut palms is somewhere between 60,000 and 80,000.

TABLE IV

Acreages Reported Planted to Coconut
Trust Territory of the Pacific Islands[1/]

District	1961	1963	1964	1965
Ponape	20,369	23,512	23,515	24,549
Marshalls	33,506	34,006	20,000	20,000
Marianas	12,944	53,815	7,749	12,850
Truk	14,619	16,639	12,380	12,380
Yap	5,750	5,750	5,750	5,750
Palau	2,952	23,800	2,818	2,858
TOTAL	90,140	157,522	72,212	78,387

1/ Trust Territory of the Pacific Islands Annual Report to the United Nations 1961, 1962, 1963, 1964, 1965.

THE EXPANSION POTENTIAL

Acreage Expansion

It is estimated that between 90,000 and 100,000 acres in the Trust Territory would be best suited to coconut production. The Land Use Suitability Inventory presented in Chapter IV of this report revealed a figure of some 54,000 acres as best suited for coconuts. That inventory was limited to 31 major islands of the Trust Territory, and excluded the some 40,000 acres of good coconut lands located on the small atoll islands. The estimate of between 90,000 and 100,000 acres for potential coconut groves is consistent with the 1957 estimate (some 90,000 acres) of Mr. W. V. D. Pieris, United Nations coconut expert.

Assuming that there are now some 70,000 acres of coconut palms in the Trust Territory an expansion of some 20,000 acres or nearly 30 percent appears to be possible.

Improving Production Practices

Growing and Harvesting. A 1952 report on the Trust Territory stated that "coconut plantings in 1952 bear all the marks that twelve years of neglect and disruption can produce."[1/] In that

---

1/ An Economic Perspective of the Trust Territory of the Pacific Islands, Donald J. O'Connor, 1952.

year copra production amounted to 11,000 tons. Since that time, some improvements have been made. Copra production has increased more than 40 percent since 1952. The Division of Agriculture estimates that since 1960 some 5,000 acres of coconut groves have been either improved or completely replanted. Local extension agents in each district have been trained in the proper methods of selecting and planting seed coconuts. Local farmers are encouraged to tend and maintain their groves. But many copra producers still want to grow as many trees as the land can sustain. The increased productivity per acre which proper spacing and brush clearing can bring is not yet widely understood.

There has been no recent study to determine maximum potential yields in the Trust Territory area. The average of one-half ton per acre, considerably below yields obtained elsewhere, has been generally accepted as the goal. Recent experience in Ceylon, India, Ivory Coast, and other areas has shown that proper plantation maintenance and fertilizing can result in yields of from three-fourths to one ton per acre.

Copra production in the Trust Territory is usually limited to the intermittent gathering of coconuts with minimal attention to the maintenance of productive groves. There is no question

that improved maintenance of existing coconut plantings would result in increased production. Several reports, including the United States Commercial Company's reports in 1946, up through and including the latest Trust Territory Division of Agriculture publications, have presented recommendations for thinning overcrowded groves, clearing nutrient sapping competitive undergrowth, and replacing senile trees. But grove improvement activities have been infrequent and usually limited to the very few areas where the local growers were convinced of their value, or where typhoons or beetles have destroyed the existing groves.

Even with the relatively low productivity of most of the groves, a sizeable percentage of the coconut crop is never harvested. The harvest rate varies from district to district and island to island. It depends on population density and on how much desire the individual copra producers have for cash income. Most growers appear to lack incentives to work harder in order to increase their incomes. Output expansion is further impeded by the difficulties of getting copra to the pick-up point and storing it there to await the uncertain arrival time of the copra buyer.

Introducing Higher Yielding Varieties. In recent years, in many coconut-producing areas of the world, increasing emphasis

is being placed on careful seednut selection. The yield of a palm may be high or low, depending upon the genetic characteristics of both male and female parent palms. Careful nursery selection is essential in the initial stages of improving the genetic strain.

Some of the palms in the Yap District appear to be superior to most other palms in the Trust Territory. Recent data collected on some selected seed palms in Yap appear to indicate that a grove of these palms could produce more than one and one-half tons of copra per acre. Unfortunately, the seed palms are widely scattered, thus it is very likely that most of these selected palms are fertilized by palms of much lower productivity. In recent years many seednuts from Yap have been shipped to most of the other districts for planting.

It is likely that within less than ten years the harvesting of coconuts from many or most of the low-yielding groves such as now generally exist in Micronesia will no longer be feasible. Even today many of the coconuts grown in some of the low-yielding and less accessible groves are not being harvested. The healthy future of the copra industry in Micronesia requires that yields be significantly improved by the introduction of higher yielding varieties and by widespread grove rehabilitation and maintenance as discussed previously.

Drying. Each of the various copra drying methods used in Micronesia has advantages and disadvantages which would vary from one local situation to another. The Marshallese type dryer is probably the best for most places. Its cost is low, maintenance is minimal, and operation is easy.

Large scale mechanized dryers do exist and produce excellent copra. But it would not be feasible to mechanizing the drying process without completely reorganizing the present small holder system of production. Cooperative processing of copra might be possible but would be difficult to institute and make successful because of the individualistic attitude of the copra farmers. Individual producers would have to be paid according to the weight and condition of the fresh coconut meat delivered to the processing facility.

Increasing Labor Productivity

In 1957 Mr. Pieris, the United Nations coconut expert, pointed to insufficiency of labor as being a contributing factor to the inability of the people to produce copra up to the limits of the natural nut production in their area. Population has increased since 1957, but so also have the alternative employment

opportunities. On the outer islands alternative opportunities are negligible and will continue to be so for the foreseeable future; yet, the lure of big money in the regional district centers will have its impact as will universal high school education which is already an adopted policy of the Administration. At the root of the problem is the low labor productivity of the copra producer. As time progresses there will be fewer and fewer young people remaining on the outer islands. Furthermore, there will be fewer young people who will be willing to make copra at the present levels of productivity in the regional or district center areas due largely to increasing alternative opportunities for higher pay. Such being the case, efforts will have to be made to increase the labor productivity of the copra producer and of the industry in general. The present difficulty associated with costs of labor and materials to get the copra to a buying station have had an inhibiting effect on efforts to increase production throughout the Territory. The costs in terms of labor and gasoline to run an out-board powered canoe eight miles one way to sell 300 pounds of copra goes a long way toward increasing the copra farmers production costs and lowering the net return for his labor. Although shipping schedules have been vastly improved over those of the past, and communications are such that outer islanders know a few days in advance when the ship with the copra

buyer on board will be likely to arrive, much is yet to be done to increase the marketing efficiency of the system which exists. Increasing the frequency and regularity of field trips and improving facilities for storage of copra could lead to a favorable impact on production on the outer islands. Construction or rehabilitation of roads on major islands could open up isolated areas and increase the labor efficiency of the domestic marketing process.

Ponape could very well be an example of the impact of alternative employment on copra production since on that island increasing employment opportunities have been available and copra production has declined for five consecutive years. Further, it is an island which has certain areas where copra must be hand-carried over difficult trails, in some instances through mangrove swamps, to a canoe and thereafter through roundabout channels in the lagoon to the district center, Kolonia. Considering the difficulties facing some copra producers, any alternative is attractive.

Majuro Island serves as an example of the effect of a project encouraging production and marketing of copra. The construction of the road around Majuro Atoll in 1958 is credited with increasing copra production on the atoll by three hundred tons.

Local attitudes in regard to allocation of government land, rehabilitation of present coconut plantings and the like are more favorable toward a continuation of small holder activities which to quite a degree will limit government project size and efficiency. Although it is likely that the small holder with no employment alternatives will continue to gather and process copra from his copra plantings to meet his limited trade goods requirements, he is in a very poor position to put into practice all the recommendations which appear to be feasible. He is having to face choices similar to those which have been faced by American small farmers for the last thirty years, namely: increasing numbers of higher paying employment alternatives, increasing costs of living, and, in district center areas, encoachment of urban businesses and government upon agricultural land. Cooperative activities may be the only way through which he can afford to adopt the more efficient technological innovations such as fertilization, mechanized methods of copra drying, and more efficient methods of transportation and storage.

ROLE OF STABILIZATION BOARD

Since 1950 all copra produced throughout the Trust Territory has been sold through the Copra Stabilization Board which is a nonprofit instrumentality of the High Commissioner.

Board members include the Deputy High Commissioner, representing the High Commissioner, the Assistant Commissioner of Resources and Development, and three department heads. As of the last meeting held June 20, 1966, the Board voted to increase the number of Micronesian members from two for the whole Territory to one from each district and to hold meetings only semi-annually. In addition the Board increased the powers of the chairman authorizing him to act in their behalf after cable confirmation, should it be necessary to modify the price paid to producers between regularly scheduled semi-annual meetings.

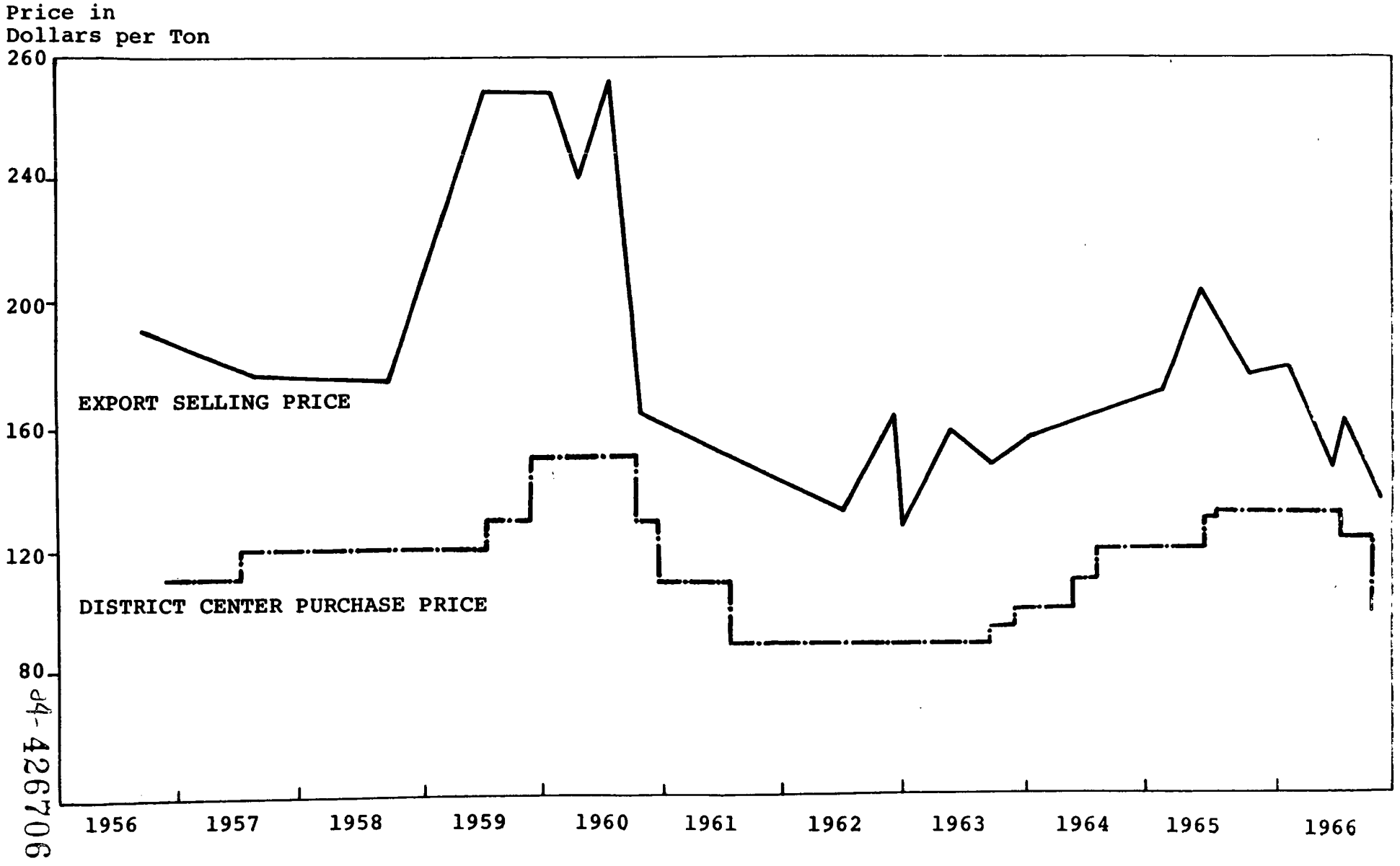
Board meetings are held to discuss and formulate solutions to all problems concerning production, grading, transportation, marketing and sale of Trust Territory copra. Before the close of each meeting the world market price is discussed in relation to marketing costs, the price being paid to producers, and the balance in the fund. A new price is justified and adopted, or the old price retained.

Importance to the Industry in Micronesia

Figure I shows the relationship between export and domestic copra price trends. The marketing costs to be covered out of the export proceeds have ranged from as high as $68 per ton to the

Figure I

DOMESTIC AND EXPORT PRICES OF COPRA



Source of Data: Trust Territory Economic Development Division files.

present low of $55. The breakdown of the latter figure is shown in Table V. It may be seen from Figure I that the margin between the export selling price and the purchase price widened in periods like 1958 to 1960 when the export price rose rapidly, and declined immediately thereafter when the price trend was reversed. Thus, the stabilization operation insulated producers from a part of the effect of fluctuating export market prices. The fund was built up to over $1,000,000 in 1960, and was drawn down to less than $500,000 in 1962. From 1962 to 1965, with some price recovery, it was built up again, but has been drawn down since mid-1965, thus absorbing a part of the recent price decline.

The price stabilization activities of the Board have very significantly contributed to stabilizing producer incomes. Three positive factors resulting from the Stabilization Board that have been given much less publicity and are perhaps more important to the well-being of the industry are: (a) the existence of a reasonably regular system of marketing by an organization which is responsible for all the facets of the marketing problem from immediate payment to the producer, to grading, storage, transporting and ultimate sale to a foreign buyer; (b) the elevation of the copra producers to the position where they compete and bargain in a volume market; and (c) the considerable saving in overhead resulting from lower

TABLE V

Estimated Costs of Marketing Copra Per Short Ton[1/]

Handling and Loading (district center)	$ 1.50
Shore Risk and Inter-Island Insurance	.10
Bank Commission	.54
Marine and War Risk Insurance	.21
Special Weighing and Surveying (Japan)	.15
Contractors Overhead Fee	2.40
Contractors Commission 2% of Export Price	3.20
Buyers Fee (district center)	10.00
Freight	16.50
Copra Tax 10% -of Domestic D.C. Price	10.25
Shrink Loss (est.)	9.87
TOTAL	$54.72

1/ Cost computed on the basis of purchases at the district center. Does not include costs associated with purchases of copra outside district centers.

SOURCE: Trust Territory Economic Development Division files.

marketing costs per ton. These advantages have resulted from the fact that the Board has been able to market all copra produced in the Trust Territory. The relatively high quality (more than 90 percent is sold as grade one) has been a favorable selling point at the bargaining table.

MARKET OUTLOOK FOR COCONUT PALM PRODUCTS

World production of fats and oils must increase at a rate not less than 2 percent per year during the next two decades in order to maintain the present per capita production level. While the output of oils from soybeans and ground nuts (peanuts) change relatively quickly in response to world market demands, and prices, oils produced from tropical tree crops generally do not. This is due in large part to the long period (6 to 8 years), required for palm trees to reach mature bearing age and the expected 40 to 50 years of productivity thereafter. As a result production of copra and the oil therefrom is much more sensitive to variation in weather such as drought, hurricanes or typhoons and the like, than it is to market price fluctuation. Partly because of an inability to respond to market demand and partly because of inherent qualities of the oil, copra oil has accounted for a declining share of the increasing world use of fats and oils.

Thus, while supply is not very sensitive to price changes, demand is to the extent that high prices of coconut oil result in a shift to other oils, but the process does not appear to be so easily reversible. Although coconut oil has been accounting for smaller portions of the total market for fats and oils the increasing demand for the group has resulted in a slight increase for coconut oil as well.

Lauric (coconut and palm kernel) oil is relatively high priced, a factor which has been primarily responsible for extensive research devoted toward developing low priced substitutes, especiall in periods of high coconut oil prices. The combination of unique chemical and physical properties of Lauric oils make the replacement difficult especially for certain food uses.

Many of the major coconut oil producing countries are projecting increases in production. Copra production in the Philippines was close to 1.5 million metric tons in 1964 and Philippine authorities project production at some 2.3 million metric tons by 1975. Other countries which forecast increases in production are Mexico, Papua (New Guinea), Ceylon, and India. Other islands in Oceania also show small projected increases.

Production increases, as forecast, could have a depressing effect on the price of copra, but there is a fair possibility that increasing demand could offset such pressures. U.S. use of edible coconut oil was some 17,000 tons greater in 1964 than in 1963 with the bulk of the increase consumption on confectionary, bakery products, ice cream, etc., which continues to be the major outlet for edible coconut oil in the United States. Moreover, the United States and the developed countries in Europe have shown a tendency to increase the use of coconut oil in soaps which reflects a growing demand for high quality toilet soaps in which Lauric oils are essential ingredients. United States utilization of coconut oil has shown a consistently rising trend since 1960, which has continued into the first half of 1965. Although United States West Coast prices for copra are higher than those in Japan, the favorable freight rate differential on shipments to Japan has resulted in a higher return to Micronesia on sales to Japan than to the West Coast market. There is little question that increased production of copra oil in the Philippines will make both Japanese and American markets more competitive. However, the major portion of Philippine copra has been of poor quality and so long as Micronesia maintains or improves the quality of its copra there should be no problem in finding a market at favorable prices for the better grades either in Japan or the United States. This would be true

even if Micronesia tripled or quadrupled its present production with major consideration being given to maintaining quality standards.

THE POTENTIAL OF COPRA PROCESSING IN THE TRUST TERRITORY

During the American Administration there have been a number of proposals to establish a copra processing plant in the Trust Territory. None of these proposals materialized. At the time proposals were made, there was question as to the availability of a desirable plant site, there was a lack of power and water in quantities required to operate such a plant and in most cases financing was rather uncertain.

At the present time there is a firm which is very interested in establishing a copra processing plant in the Trust Territory. This firm has more than adequate capital for investing in such an enterprise, but it is well aware of the relatively narrow margin for profit which is associated with copra processing plant operations.

The importers of copra are interested in the cake as a livestock feed as well as in the oil. The profit margin for copra processing in the Trust Territory would depend to a considerable extent on the value of the cake as a feed in the

Territory. Hence it is necessary to consider the demand for the cake, i.e., how much would be bought for livestock feed over a range of prices. A feasibility study is needed to determine the optimum size of a processing plant, the profitability of such an operation and the economic benefits to the Territory.

While copra processing is not an industry with large economies of scale, the optimum size might well be larger than that which could be supported by production in the Territory. Copra could be imported if necessary to provide the volume of raw material needed. The feasibility study would include a consideration of sources of supply and cost landed at the processing plant.

The study should consider alternative locations for the plant within the Territory in terms of costs of assembling the raw material, and shipping the products to the appropriate markets. Consideration would also be given to the availability of power, water, labor and a suitable plant site.

Japan, the United States, and Canada would probably be the major alternative markets for the oil. Consideration should be given to relative prices and shipping costs as they affect net returns from sales to the alternative markets. Most of the copra

is presently sold to Japan mainly because of preferential freight rates which were negotiated for bulky copra cargo. It is possible that preferential rates on oil either to the United States or to Japan could be negotiated. Copra cake might be exported even though it is a low value product to bear the transportation costs. But there is a clear transportation economy in using the cake in the Territory especially to the extent that it could be substituted for feed presently being imported.

The economic benefits of a copra processing industry to the Territory are likely to come about through the use of the cake in expanding and improving the livestock industry. If any increase in prices of copra to producers would result this, of course, would be a stimulus to production as well as an addition to income. The margin of profit in processing alone is not large, and this is not a labor intensive industry.

SUMMARY, RECOMMENDATIONS, AND SUGGESTED PROGRAMS

It is estimated that two hundred man-hours may be required to make one ton of copra. At this rate, only fourteen hundred men working a 40-hour week on a yearly basis would be required to

produce the close to fourteen thousand ton annual production level of the Territory. However, copra is not produced by farmers who work a 40-hour week, but rather by farmers who are deeply rooted in a subsistence system of life and involved in many other activities in addition to making copra. Although labor should be adequate in most areas, the many activities requiring a portion of the local copra producers' time may result in a scarcity of labor for copra-making in limited areas of the Territory. If there were no competition for labor in these areas the problem would undoubtedly be solved over time by the increasing population, however, the increasing demand for labor by both government and private enterprise limit the solution of scarcity of labor for copra production to increasing the efficiency of the copra producer.

Factors contributing to the average low yield of copra per acre in the Trust Territory are listed as follows:

1. Inefficiency of the domestic copra marketing system. (Poor storage facilities and difficulty in transporting copra to central locations for either storage or sale.)
2. Low labor productivity and lack of labor in some areas (Yap).
3. Scarcity of trade goods (incentive) in outer island areas.

4. Under-utilization of fallen nuts.
5. Over-crowding of groves.
6. Superannuation of palms.
7. Competition from jungle and other useless vegetation in coconut groves.
8. Decreasing fertility of the soil.

Recommendations

The overriding objective of all activities in the industry will be to increase production levels and to maintain high standards of copra quality. Only to a very limited extent do the three minor objectives listed and described more fully below require a particular phasing since it is expected that some of the activities described will be conducted simultaneously. A multiple stage program aimed toward increasing production is required and would consist of:

(a) survey and evaluation of the condition, productivity and acreage of all groves to program specific action for specific areas for the purpose of increasing copra production;

(b) a program that would in the short period increase production by 50 percent from plantings already in existence; and

(c) a coconut replanting program, utilizing nursery selected seed from high yielding genotypes to increase yield potential.

Due to the relative old age and poor condition of the major portions of the area planted to coconut at this time, a 20-year program should either replant or rehabilitate approximately three quarters of the present area planted to coconut.

Since well over $100,000 annual tax revenues generated from the sale of copra are available to the Congress of Micronesia to be allocated as they see fit, it is strongly recommended that with few exceptions all Trust Territory copra development programs be funded on a matching basis. In this respect the decisions for investing in the future of the coconut industry will be made by those who to a great extent will be responsible for carrying out initial and follow-up programs on the district level. With the exception of research and disaster relief, Federal grants for coconut development should not exceed amounts allocated by the Congress of Micronesia since the latter will be indicative of the interest of the people in such programs and should prove to be a reliable forecast of the level of success which will be achieved.

Specific recommendations are as follows:

Survey and Evaluation

A grove by grove survey is required to determine average age of the planting, average yield per acre of the planting tied to condition (over-crowded groves, competition from jungle growth and other useless vegetation, soil condition, etc.) with estimates of levels of production which could be achieved should specific recommendations be followed.

Efforts to Increase Production by 50 Percent in Five Years

The Administration should undertake a program which would facilitate the marketing of copra and the introduction of trade goods into central collection points of copra productive atolls. Such a program would include providing cooperatives with loan capital to purchase and/or construct warehouses for adequate storage of copra, boats for lagoon transportation to facilitate delivery of copra from producing areas within an atoll to the central collecting point, and a trading center for building material, cloth, staple food items, fuel and other commodities. Such a facility could provide the incentive for production by having trade goods readily available for sale to the atoll and outer island inhabitants The provision of an adequate storage facility which would be capable of holding six weeks to two months production would encourage

continual copra production rather than the flurry of copra making which takes place just prior to arrival of a field-trip vessel. Lagoon transportation within the atoll would increase labor productivity by about 10 percent.

Simultaneously with a program aimed toward improving the efficiency of the domestic copra marketing system, vigorous effort should be directed toward thinning of the over-crowded coconut groves and clearing of the brush and other useless vegetation which compete with the coconut palms for nutritional requirements on more than half of the present area planted. Leguminous cover crops should be planted between coconut palms. Such a program would coincide and follow up the recommendations made for specific groves and would place responsibility on specific persons or groups of persons throughout the Territory. Such a program although directed by government personnel, following recommendations by government experts, would be an action program by the copra producers of Micronesia. In this particular program each copra producer must be considered an important person, and this consideration should be highlighted by initiation of a district and Territory-wide system of awards for coconut grove maintenance and high per acre yields. Such awards should be made on an annual basis and if necessary to get the program underway a small subsidy should be initiated to provide token payments for proper plantation and

coconut grove maintenance. Field experiments and experience in countries exhibiting high copra yields per acre would indicate that nutrition plays a very vital part in the combination of factors which determine the ultimate yield of the coconut palm. Efforts should be made to determine the feasibility of fertilizer use on low yielding mature palms. Once proven to be feasible, a pilot project should be set up to have local farmers fertilize their palms, with arrangements for collection of payment for fertilizer to be made over a five-year period from the increasing production.

Long-Term Replanting Program

The value of such a program is multiple. Of concern is the fact that present estimates indicate that more than half of the total area planted to coconut is approaching senility due to lack of care, age, and declining soil fertility, which can be expected to result in a marked decline in productivity during the next 10 to 20 years. Even to maintain present levels of production will require that extensive replanting be undertaken.

The economic impact of such a program will to a very great degree be controlled by the availability of workers willing and able to make copra. In this respect the impact would be measured in the amount of copra produced when the replanted areas

come into bearing. Other less tangible values would be the positive effect to the tourist industry resulting from the increased beauty and tropical atmosphere which well kept healthy palms provide to the islands and the insurance value and added confidence in a prosperous future which only young healthy palms can provide to island people.

The importance of utilizing seednuts with high yielding characteristics cannot be over-emphasized since high yield genetic characteristics coupled with proper nursery selection have been shown to result in significantly higher yielding mature palms compared to palms grown from nuts selected at random and can result in close to a 100 percent increase in labor productivity associated with grove maintenance and copra making. Further, considering that the return from the time invested in planting will be reaped over a three-decade period, it is of utmost importance to take every precaution to assure that returns from harvesting activities will be of such magnitude as to be competitive enough to ensure that labor will be available.

Assuming that sufficient labor will be available for maintaining groves and producing copra, the following replanting program is strongly recommended and should be accorded a priority

consistent with the desires and interest shown by the Congress and people of Micronesia.

Selection of Planting Material

Selection from Available Stock. Selection of planting material should follow a practice of using nuts only from desirable genotypes coupled with a rigid system of nut culling in the nursery. Since it would be difficult to select purebred genotypes due to intermixture and crosspollination between varieties in most areas, seed production should be concentrated on isolated areas just coming into production and planted predominately to the Thifoo or other desirable variety from Yap, with removal of undesirable genotypes an integral part of the program. It is assumed that application of chemical fertilizers to such stands would be feasible.

Development of New High Yielding and/or Hybrid Varieties. Nurseries should be established to develop new high yielding planting material by controlled crossbreeding of selected high yielding Thifoo individuals, and crossing typica , late bearing, tall palms X nana, early bearing, dwarf palms to produce early bearing high yielding hybrid crosses. This type of activity is being successfully undertaken in other areas, and is absolutely

essential to promote the long-term viability of the industry, even though the results would not be apparent for ten to twenty years. Such a program is a research activity and should be supervised by a competent tropical plant geneticist on a full-time basis.

Replanting and Rehabilitation

Such activities should proceed from area to area as prescribed by priorities and recommendations arising from the survey made during the first stage of this program. Programming of replanting activities should give priority to areas having the greatest commercial development potential over those just in need of replanting (i.e., large blocks which could make road and other transportation development feasible).

Subsidy Payments

Direct subsidies to farmers for replanting should be continued.

Follow-Up Activities

The overall replanting program must include plans for follow-up activities one year after planting and every other year thereafter for a period of six years at which time the new groves will come into bearing. Consideration should be given to establishing smaller subsidies for follow-up activities.

Such subsidies might be in the form of fertilizer should trials show that such applications to coconut palms in the Trust Territory are feasible.

Copra Processing Plant

The possibilities of a copra processing plant are sufficiently promising to justify early thorough investigation. This can best be done by persons familiar with the technology and economics of the industry. Accordingly it is proposed that arrangements be made as soon as possible for such a study along the lines indicated earlier in this chapter. This study might require approximately three man-months.

Intercropping and Diversification

Diversifying an economy to get away from reliance on a one-crop economy is often times a very justifiable goal; however, occasionally such policies go overboard, with too much effort being directed away from the major crop, resulting in a decline in yield, and total production. In the Territory, intercropping or planting a crop of cacao for example between coconut palms is a way which can be employed to both diversify and increase the dollar

value of the total yield per acre. It should be attempted, however, only under technical supervision, since without proper spacing or fertilization, competition between the coconut palms and the diversifying crop is likely to occur. Unless properly implemented, intercropping can result in low yields from both the primary and secondary crops. Intercropping is recommended where it will be implemented under competent technical supervision.

EXPANSION POTENTIAL AND RESOURCE REQUIREMENTS

Total implementation of the recommended long-range copra industry development program would require an additional 20,000 acres of land, while Government program activities would cover a total of some 100,000 acres. Five-year program goals would include rehabilitation (brushing and thinning) of 25,000 acres of coconut groves, and either planting or replanting of an additional 7,500 acres. Such activities would require some 31 salaried workers and a program cost of about $1,000,000 over a five-year period. In addition it is expected that farmer-contributed labor will amount to 400 workers on an annual basis for the five-year period. Total private capital investment will amount to close to $1,000,000.

Tc successfully implement the aforementioned recommended programs will require establishment of a Coconut Industry Development Section within the organization of the Division of Agriculture discussed in Chapter Four of this report. This section will be responsible for planning and directing the coconut development program throughout the Territory. Some Americans will be required to perform supervisory functions, however, it is felt that Peace Corps Volunteers, under the direction of the District American Extension Agent could fulfill the requirement for field level supervisory staff.

The overall functions of the Coconut Industry Development Section will require the full-time attention of a tropical horticulturist and a plant geneticist with relevant tropical experience. (Both are new positions).

Implementation of the total program should result in an increase in copra output of more than 50 percent by 1972. The combined gross revenues from all copra industry activities should reach a level of $4,000,000 per year by 1972, and will continue to increase as new plantings reach mature bearing age.

CHAPTER SIX

COMMERCIAL FISHING

Fishing is a traditional economic activity in the Trust Territory. During the period of Japanese occupation, fish products were a major export of the area. In both the subsistence and market sectors of the island economies, fish and other marine products are still the major source of protein for the Territory's people. Given the importance of marine products to the local economies, and the potential of commercial fishing as a source of jobs and money income, a major effort should be made to expedite the development of economic activities based on the marine resources of the Trust Territory.

INSHORE FISHERIES

Inshore fishing operations in the Trust Territory are conducted by local fishermen who take fish by use of spears, fish traps, or small boats which troll or run light nets. In addition, crabs, longusta, trochus, clams, and other kinds of shellfish are caught by inshore fishermen in most areas. During

the time of Japanese administration, trochus, which have a heavy cone-shaped shell suitable for making "pearl" buttons, were planted in several places in the Trust Territory. The expanded use of plastics in the manufacture of buttons has largely eliminated the export of trochus shells which, until recent years, provided a small but significant source of income to Micronesians.

Generally, but not always, inshore fishing is confined to reef areas. In a few instances boats range a considerable distance from land. Because of the size of the boats, however, safe operation demands that the boats return to shore each evening.

While the preponderance of the inshore catch consists of varieties of the small fish which are found in the lagoons and around the coral reefs, some kinds of tuna and other pelagic (free-moving, offshore) fish are also taken. The inshore fisherman generally takes fish of any edible species.

For the most part, the fish caught in inshore areas are consumed by the fisherman, his family, and his neighbors. Because the majority of the people of the Trust Territory live in very small communities, away from district centers, the local fisherman usually has no market in which to sell his catch. Thus, while

inshore fishing provides an important source of food, it does not generate money income for most fishermen.

With the growth of the district centers, and the increasing number of Micronesians who are entering the market sector of the economy, the market demand for fish is constantly increasing. Because of labor shortages, poor local fishing conditions, and lack of organization, the supply of fish in some district centers is inadequate to satisfy the demand for fish at any reasonable price level. In the past, fish have been exported from some district centers to other district centers. Fish rarely are shipped into a district center from other parts of the same district because of infrequent transportation and lack of refrigeration facilities in outlying areas.

At the present time, the some 75,000 residents of Guam provide a major market for fresh fish. Guam has a growing population and a very limited lagoon area. As a result, the small reef fish which enjoy the favor of Guamanian consumers are in short supply most of the time. In response to this demand, the fishing cooperative in Palau makes regular shipments of reef fish to Guam.

OFFSHORE FISHERIES

Offshore fishing operations in the Trust Territory are entirely commercial and are confined, at the moment, to the Palau District. The offshore fishing boats are relatively large (60 feet or longer) and are specifically designed for the purpose of taking small "skipjack" tuna. While other larger kinds of tuna are found in Trust Territory waters, present operations are not well suited to harvesting them.

The Japanese conducted extensive offshore fishing operations for skipjack tuna in Micronesia prior to and during World War II. However, it was not until 1965 that the industry was re-established when Van Camp Fishing Company constructed a freezing plant, with an annual capacity of 6,000 to 8,000 metric tons of fish, on Malakal Island (adjacent to Koror) in the Palau District. This Company currently operates 12 fishing boats. Until recently, a local Micronesian company operated an additional seven boats and sold the fish to Van Camp. Frozen fish are shipped from Palau to Van Camp canneries in American Samoa, Puerto Rico, and on the west coast of the United States.

Basically, there are two reasons why the development of offshore fishing has been almost entirely concerned with skipjack

tuna. First, Japanese records of fishing activity in the Trust Territory give little information about the kinds of tuna, other than skipjack, which may be caught in Trust Territory waters. Given the fairly large investment which is necessary to begin tuna operations, it has appeared wise to follow development paths which have already been proven, or at least explored. Second, kinds of tuna other than skipjack apparently tend to move at rather substantial depths in the Western Pacific; American fishing techniques are not suited to deep water operations. Even the Japanese, who currently conduct major long-lining operations, are finding that the traditional subsurface fishing techniques, particularly long lining, result in such low labor productivity that subsurface fishing operations are rapidly becoming questionable as profitable economic activities.

JAPANESE COMMERCIAL FISHING EXPERIENCE IN THE MANDATED ISLAND

During the period of Japanese occupation, long-line boats did fish for subsurface tuna. Because these boats operated from bases in the home islands, it has not been possible to determine the portion of subsurface fish landed at Japanese ports which came from Micronesian waters. The catches were intermingled with fish taken from all parts of the Pacific.

In regard to skipjack fishing, it appears that fishing activity in Micronesia was very limited from 1917, the beginning of Japanese administration, until 1930. No catch records are available for years prior to 1930. Apparently, the Japanese carried out a program of research and exploration over that period.

Beginning in 1930, government facilities and subsidies were provided to attract capital and labor to the industry. Because of serious problems presented by poor transportation and inadequate refrigeration facilities, practically all skipjack caught in the Mandated Islands were processed into dried fish sticks (katsuobushi) for which there was and still is a substantial demand in Japan. It was only toward the end of Japanese administration that a cannery was constructed at Palau and a freezing plant was installed at Truk.

While records indicate that the Japanese fished for skipjack in all parts of the area they administered, the degree of success appears to have varied considerably from district to district. Table I, page 7, summarizes the Japanese experience for each of the years from 1930 through 1940.

From 1930 until 1937, reported skipjack catches increased throughout the entire mandated area as the Japanese promoted the

Table I

Japanese Skipjack Catch in the Mandated Islands
1930-1940
(Metric Tons)

	Saipan	Yap	Palau	Truk	Ponape	Jaluit	Total
1930	258.0	.9	157.1	913.4	6.4	N/A	1,335.8
1931	564.3	.4	548.1	1,097.1	525.2	81.3	2,816.4
1932	1,309.7	N/A	1,592.3	810.3	534.2	614.8	4,861.3
1933	1,762.3	N/A	2,144.5	1,883.4	926.9	172.4	6,889.5
1934	2,516.0	4.2	3,778.7	1,200.0	1,202.5	255.1	8,956.5
1935	1,786.0	N/A	5,391.0	3,002.4	1,313.1	229.8	11,722.3
1936	1,696.0	N/A	3,836.0	5,870.2	2,695.8	167.7	14,265.7
1937	2,697.3	N/A	13,774.7	12,433.5	4,064.0	91.3	33,060.8
1938	2,392.0	149.3	3,420.2	5,294.8	1,495.6	6.7	12,758.6
1939	2,087.0	36.1	3,548.8	7,640.0	3,707.8	N/A	17,019.7
1940	3,379.1	3.6	6,047.4	7,217.1	1,586.3	1.5	18,235.0

Source: The Japanese Tuna Fisheries, United States Department of the Interior, Fish and Wildlife Service, Fishery Leaflet #297 (April, 1948), p. 17.

industry's development. In 1937, dramatic increases in production occurred. Because the whole Pacific basin enjoyed unparalleled catches in 1937, some portion of the increase was probably the result of a long-run cycle in tuna population and/or migration which peaked in that year. The great increase in the supply of fish on the world markets during 1937 seriously depressed world prices for fish.

The Japanese records for 1938 and subsequent years are difficult to interpret. The skipjack catch in 1938 was well below the catch reported for 1936 in most districts of the Mandated Islands. Furthermore, while the industry partially recovered from the great decrease in output which occurred in 1938, total production for the entire area in 1940 was still less than 60 percent of the total production during the peak year of 1937.

In the last few years of Japanese fishing in the Mandated Islands, a number of serious restrictions were imposed on fishing operations. First, because of the detrimental effects of the huge catch of 1937 on the price of fish sticks in Japan, quotas were imposed in each district. Second, as a result of Japanese military activities in China, boat fuel, boat parts, and labor

were rationed. Finally, the large quantities of bait fish required to catch the numerous schools of skipjack moving through the Mandated Islands area in 1937 caused anxiety about the ultimate depletion of the supply of bait fish.

The bait fish are small sardine-type fish found within reef areas close to shore. They are used to attract and hold schools of skipjack close to the boat while fishermen catch the tuna with artificial lures. Without bait it was virtually impossible for the Japanese to catch commercial quantities of skipjack. The technology of fishing today still requires the use of bait in skipjack fisheries. As a bait conservation measure, the Japanese restricted the number of fishing boats in the Mandated Islands. Table II, page 10, indicates the number of boats fishing for skipjack in the Mandated Islands during the years 1932-1939.

THE STATUS OF COMMERCIAL FISHING IN TRUST TERRITORY

Marianas District

Local fishermen on Saipan, who run several small outboard motor boats, conduct the only commercial tuna fishing operations in the Marianas District. Fish are caught by trolling around Saipan and Tinian, using artificial lures as bait. The small

Table II

Number of Commercial Fishing Boats
in Japanese Mandated Islands
1932-1939

	With Engines	Without Engines
1932	63	1,053
1933	62	314
1934	93	316
1935	108	265
1936	216	237
1937	315	329
1938	391	468
1939	145	N/A

Source: Fishing Industry of the Japanese Mandated Islands, Office of the Chief of Naval Operations, United States Navy Department (August, 1944), p. 14.

amounts of tuna which are caught in this manner are sold locally and in Guam. Reef fish, taken by nets or spears, are disposed of in a similar manner.

As in all of the districts of Trust Territory, many people fish in the lagoons and other protected areas to catch fish for themselves and their families.

Yap District

The Japanese never established any significant commercial fishing operations in the Yap District. On the basis of observations of Trust Territory fisheries personnel, the main reason for the lack of Japanese fishing activity in Yap appears to have been insufficient quantities of bait fish. Today, there is no commercial fishing in the Yap District. Inshore fish taken by local fishermen are absorbed in the non-market sector of the Yapese economy.

Palau District

The Palau District was one of the most highly developed commercial fishing areas in Micronesia during the time of Japanese administration. The fairly large population of the area and the large number of persons in the market sector of the economy provided a substantial local demand for fish. Substantial

quantities of fish sticks were produced for export, and during World War II a cannery was constructed and operated in the Koror area.

Until a few years ago, little had been done to re-establish commercial fishing in Palau. In 1959, the Trust Territory Government stationed a marine biologist at Koror and work was commenced to rebuild a commercial fishing industry in the area. Docking facilities were repaired, shops were constructed, ice-making machines were procured, and a substantial storage freezer was installed.

Palau Inshore Fisheries. As part of the commercial fisheries program in Palau, the Palau Fishing Cooperative was organized to market reef fish and tuna locally, in Guam and in other Trust Territory districts. This cooperative now has approximately 90 member fishermen who operate their own small boats and deliver their catches to the Co-op. Many members do not rely entirely on commercial fishing for their livelihood.

While the Palau Fishing Cooperative has enjoyed some success, it faces a number of serious problems. First, as a result of recent changes in inter-district shipping routes, it is no longer possible for the Cooperative to market fish in

other Trust Territory districts. All shipments from Palau to other districts must be transshipped through Guam or Saipan, thereby making inter-district shipping costs from Palau to other districts prohibitively high.

Second, as a result of the operation of a substantial tuna freezing plant in Palau and the operations of several large tuna boats, the fishing co-op will face considerable competition from undersized tuna (fish too small to be canned economically) in both the local market and the Guam market. If and when a skipjack fishery is established in Truk, the competition in the Guam market will be stiffened by undersized tuna moving into Guam from Truk.

Palau Offshore Fisheries. The skipjack fishing industry was revived in 1964 when Van Camp Tuna Company constructed a 1,500 metric ton frozen-storage plant in Palau. Under the current United States tariff structure, frozen tuna imported to the United States is not subject to tariffs. Canned tuna is subject to tariffs as high as 25 percent ad valorem.

While fresh skipjack may bring $200 or more per metric ton when delivered directly to the canneries in Hawaii, American Samoa, or on the west coast of the United States, because of

the additional freezer processing, handling, and transportation involved in marketing Trust Territory fish, fresh skipjack delivered to the freezer in Palau may bring as little as $95 per metric ton.

When Van Camp's commercial operations began in Palau, a small group of Palauans amassed enough capital to purchase seven second-hand boats in Okinawa. The total Palauan fishing fleet then consisted of 19 boats. As was the case with Van Camp, the Micronesian boat owners used Okinawan fishermen with the understanding that eight positions on each boat would be reserved for Micronesians. Poor fishing, poor management and undercapitalization eventually resulted in discontinuation of the operations of the Micronesian fishing company. Their seven boats are now lying idle in the harbor at Koror.

A major problem of the Trust Territory fishing industry has been the lack of interest of Micronesians in becoming off-shore fishermen. At the present time there are more than 50 vacant fishing jobs available for Micronesians in Palau. There appears to be little likelihood of filling these jobs permanently with Micronesians in the near future.

All fishermen work on a share basis and monthly income is extremely variable. From the day's catch, the cost of food and boat operation is deducted. The remainder of the day's proceeds are shared by the boat and the crew--40 percent to the boat, 60 percent to the crew. Given this arrangement, an average crew member will realize from $800 to $1,000 during the course of a year. In some months, however, a fisherman may earn nothing at all. Because the Okinawan Government has insisted on guarantees to insure that families left at home are supported, a $50 per month guarantee is given to all Okinawan fishermen working in the Trust Territory. Micronesians receive no such guarantee. Furthermore, fishing boat operators allege that the economics of the fishing operation preclude extending similar guarantees to Micronesians.

The problem for boat owners is highlighted during a month in which fishing is poor. If, during the first three weeks of a month the weather prevents boats from going to sea, fishermen will see little gain in working the last week of the month because it will be impossible to improve their income beyond what they would receive under the guarantee arrangement.

In addition to the great variability in monthly income, the total amount of yearly income from fishing is not regarded

as adequate by most Micronesians. Given labor shortages produced by the high demand for labor by the Trust Territory Government, shore-side wages are generally higher than the wages received by fishermen.

Micronesian cultural values are not consistent with the discipline which is required of offshore fishermen. In most Micronesian societies, a man has family obligations which restrict the amount of time he may spend away from home. The Micronesian sense of obligation to a job does not always include an appreciation for need to maintain a sustained effort. The life of a skipjack fisherman is demanding. Except when the operations are interrupted by weather conditions, the fisherman must spend virtually all his time on the boat working odd hours throughout the day (catching tuna) and night (catching bait fish). The traditional way of life and the relative ease of subsistence living in most of Micronesia have not prepared the people for this type of rigorous and sustained effort which men in other parts of the world usually are forced to undertake out of necessity. The alternative of government employment offers shorter hours and higher wages and carries greater prestige. Only with sufficiently increased productivity to allow more pay for less effort

can a fishing industry be built on the basis of Micronesian fishermen.

The Van Camp operation employs 40 Micronesians on shore, and the shore-side wage bill amounts to approximately $5,000 per month. This money flow through the community is supplemented by expenditures made by Okinawans who work on the boats. Altogether, the Van Camp fishery probably generates between $150,000 and $200,000 per year in income, through direct and indirect means, for Palauans.

Truk District

The Truk District, along with Palau, was a focal point of Japanese surface fishing development. A freezer processing plant was built on the island of Dublon in the latter part of the 1930's. The number of Japanese skipjack fishing boats operating from Truk exceeded the number in any other district.

Today, the only commercial fishing in Truk is conducted by a small fishing cooperative. An inadequate quantity of fish are caught for the local market, so there is a demand for imported fish.

The Van Camp Company has indicated plans to construct a freezer plant in Truk, similar to the Van Camp facility in Palau.

Ponape District

Although the Japanese caught impressive quantities of tuna in the Ponape District, commercial fishing in Ponape today, as in Truk, is limited to the activities of a small fishing cooperative. Reef fish, and a small amount of tuna taken by trolling, are caught and sold in the local market. On a few occasions, fish have been exported to Truk. The expansion of commercial fishing operations in the Ponape District does not appear to be likely in the near future.

Marshalls District

Because of the scattered and relatively isolated populations of the Marshalls District, and because of the limitations of the transportation system, the marketing of locally caught fish in the Marshalls is extremely difficult. At the present time, no commercial offshore fishing activities are conducted in the Marshalls District. Some commercial inshore fishing activity does provide fish for markets in Majuro and other population centers. For the most part, however, fishing in the Marshalls is simply a subsistence activity.

FACTORS DETERMINING THE DEVELOPMENT OF COMMERCIAL FISHERIES

The development of commercial fishing in the Trust Territory will be contingent on the manner in which the basic difficulties which will hamper, or perhaps prevent, such development are confronted. The problems of developing commercial fisheries will only be overcome if imaginative policies are formulated and implemented vigorously. In general, these problems relate to the extent of marine resources, fishing and processing technology, the availability of labor, the accessibility of markets for marine products, and the availability of the entrepreneurs and capital necessary for the economic exploitation of the marine resources.

Extent of Marine Resources

While many of the islands of the Trust Territory are characterized by coral reefs and relatively large lagoons, none of the islands has a substantial shelf area. The ocean bottom usually drops to depths of thousands of feet within a short distance from shore. For this reason, inshore fisheries development will probably be limited. The relatively small quantities of reef fish which can be caught, and the relatively small quantities of pelagic fish which may be taken by small boats

will probably be absorbed by local markets which will be created by the continued concentration of population and growth of the money sector of the economy.

As in all cases where resource scarcities appear to limit potential economic development, technological advancements may eventually allow a much more efficient and intensive utilization of inshore resources. Improved fishing techniques, more effective conservation practices, and fish farming could conceivably lead to the development of an export industry based on inshore marine products.

There is little question that a broad range of marine resources are available for the development of commercial offshore fishing in the Trust Territory. There are many varieties of fish in the Western Pacific which may one day be harvested. However, with current resource knowledge and technology, the offshore fisheries probably will be forced to rely on various kinds of tuna--particularly skipjack. While skipjack are abundant in many areas of the Trust Territory, the small bait fish which appear to be essential to commercial skipjack fishing are found only in a few areas. There is evidence that these bait fish may be available only in limited quantities in the areas in which they are found.

In part, the problem of adequate bait fish supplies is related to the general problems of the inshore fisheries. The bait fish may only be gathered in protected areas where it is possible for the fish to mass in large numbers without being attacked by larger fish. Given the limited shelf areas of the islands, there are relatively few places where large numbers of the bait fish may aggregate. Little is known about the life cycle of the bait fish, and there is considerable concern on the part of fisheries experts about the possibility of depleting the bait fish stocks by excessive fishing.

In order to determine the precise limits of the bait resource, a research program must be designed to investigate the migratory habits and life cycle of the bait fish. In the meantime care must be taken to prevent the resource from being completely destroyed before a conservation program can be established. As indicated above, the Japanese limited the number of boats fishing in the Palau areas as a bait fish conservation measure.

Availability of Labor

A major restriction on the development of commercial fishing in the Trust Territory is the limited Micronesian labor

force. Not only is the labor force small in absolute terms, but the general level of wages which it receives is relatively high. During the period of Japanese administration, more than 3,000 persons (mostly Okinawans) were employed in the fishing industry in Palau. Today, the entire male labor force of Palau probably does not exceed 2,500 workers. Most of these people are already employed. Even conceding advances in technology which may substantially reduce the number of fisheries workers required, it is almost inconceivable that the levels of fisheries production attained by the Japanese in Palau could be realized by relying only on Micronesian labor.

In regard to wages, commercial fishing must compete for wage labor with government and other employers who must, in turn, compete for labor with a subsistence sector which provides a reasonably high level of consumption. Furthermore, Trust Territory Government wage policies have been aimed more toward supporting living standards than toward rewarding productivity, and have tended to supplement the upward pressures on wages caused by the limited supply of labor.

The commercial offshore fisheries catch tuna for export and sell their product in a highly competitive world market. Long-run market prices are generally determined by fish caught

by the low-cost producer. Trust Territory fish are competing with fish taken by low wage, often highly skilled, fishermen from Taiwan, Korea and other countries of the Far East and Africa. Because of the highly competitive nature of world fish prices and the relatively low productivity of unskilled and inexperienced Micronesian labor, the economics of offshore commercial fishing simply does not allow sufficient earnings by fishermen to attract Micronesian labor away from other employment, primarily government employment, or even from subsistence activities. Without an imported labor force, an offshore commercial fishery could not exist in the Trust Territory today.

To some degree the inshore commercial fisheries suffer from the same labor problems as do the offshore fisheries. Because inshore fisheries, selling fish in local markets, do not compete in world markets for fresh fish (although they do compete with imported substitutes such as canned fish), the margin between production cost and market price is not so restrictive. Earnings of inshore commercial fishermen are generally better than those of offshore fishermen; the work follows more closely the traditional methods of fishing; and the fisherman is his own boss and can adjust his work hours to suit his own desires, needs and communal obligations.

Access to Markets

In regard to world trade in general, and to the marketing of fish in particular, the Trust Territory suffers many disadvantages. As mentioned above, fish from the Trust Territory enter the United States on the same terms as fish from low-cost producers in Japan and other nations. United States tariff restrictions on canned tuna very effectively preclude the possibility of establishing a fish cannery in the Trust Territory.

American fishing companies using American labor and facing relatively high production costs generally do not compete in world markets. Protective devices shelter the huge domestic markets in the United States from the lower cost foreign producers. If an American company established a cannery in the Trust Territory, the products of that cannery would have to compete with other foreign canned fish in United States markets. It would be difficult to establish a profitable cannery in the Trust Territory even under conditions which would allow for free entry of Trust Territory canned fish into the United States. Such a project is completely infeasible as long as canned fish from the Territory are subject to United States tariffs.

The development of offshore fisheries in the Trust Territory in the near future must rely on foreign markets.

Local market demand is not large enough to sustain canning operations at the scale required to support an industrial complex consisting of specialized boats, skilled fishermen and trained cannery workers. Furthermore, distribution problems would almost assure that the product of such a cannery would have little or no price advantage for local consumers.

While it may be conceivable that foreign fishing companies, possibly Japanese companies, could be encouraged to utilize Trust Territory islands as land bases, it does not appear likely that cannery operations would be established in the Trust Territory by these companies. Trust Territory wage levels and transportation costs would probably cause the total costs of canning operations to be significantly greater in the Trust Territory than in the home country.

Availability of Entrepreneurs and Capital

Inshore Fisheries. Because commercial inshore fishing activities in the Trust Territory are actually an extension of a traditional activity, a fairly substantial number of Micronesians possess the basic skills required to conduct inshore fishing operations. Investment requirements are generally less than $3,000 for the individual fisherman. Most fishermen may rely

on government loans or family loans or assistance for their investment and operating capital.

In some districts the lack of shoreside facilities limits the expansion of inshore fishing activity. The organization of fishing cooperatives to obtain government or bank loans in order to establish shoreside refrigeration facilities and maintenance shops, as well as to improve marketing techniques, appears to offer a satisfactory solution to the problem. A serious drawback to this approach is that all of the currently established fishing cooperatives suffer from the lack of adequate management.

Offshore Fisheries. The failure of the Micronesian fishing company, which operated seven Okinawan tuna boats, to catch fish for sale to the Van Camp Company in Palau reveals the problems associated with establishing a Micronesian offshore fishing industry. At the present time, Micronesians do not have the skills or capital to conduct the operations of a specialized industry which competes in a world market.

The amount of capital required to establish an offshore fishery is substantial. It is estimated that the relatively small freezing plant and the twelve boats operated by Van Camp Company in Palau represent an investment in excess of a million

dollars. The managerial and engineering complexities of even this relatively small installation are far beyond the current technical competence of the Micronesian businessmen and technicians who might be available to engage in such enterprises.

Given the competitive nature of the world tuna industry, the expressed interest in the Trust Territory by major American tuna companies, and Trust Territory efforts to remove restrictions and provide incentives for expansion of the commercial fishing industry, the capital and managerial and technical skills of major American fishing firms can undoubtedly be attracted to the Trust Territory. But without foreign capital and managerial and technical skills, it is unlikely that the offshore fish resources, no matter how rich, will support the development of economic expansions in the foreseeable future.

SUMMARY OF POTENTIAL

Inshore fisheries in the Trust Territory probably can be developed by drawing on internal resources. While the scope of development will be limited to serving local and perhaps Guamanian markets for fresh fish, the numbers of persons employed and the incomes generated can substantially strengthen the local economies.

Offshore fisheries, while possessing the potential of becoming a major industry in the Trust Territory, will probably develop only if outside resources (specifically capital, labor and management) can be overtly attracted. Active research programs must be established to discover and to provide potential investors with essential information about the extent of offshore marine resources and to develop new techniques to increase fish yields.

The three million square mile expanse of ocean which surrounds and separates the islands of the Trust Territory probably constitutes the area's greatest asset. Government policies must reflect an active desire to assist and promote the exploitation of marine resources if the Territory is to realize the full long range economic potential of the commercial fishing industry.

RECOMMENDATIONS AND SUGGESTED PROGRAMS

There are four basic programs required to stimulate the maximum possible expansion of commercial fishing in the Trust Territory. These programs include a legislative program to be implemented by the United States Congress, a program to

solicit external resources, a program to provide the necessary infrastructure for commercial fishing, and a long-range program for the direct support of fisheries activities by the Trust Territory Government.

Legislative Measures

Removal of Tariff Restrictions. Legislative proposals should be presented through regular channels to the United States Congress to remove restrictions which are especially detrimental to the development of commercial fishing in the Trust Territory.

Of most immediate concern are United States tariffs which are applicable to Trust Territory marine products. The potential expansion of offshore commercial fishing in the Trust Territory can only be realized if Trust Territory products are allowed free access to United States markets.

It is recommended that the High Commissioner work with the Department of the Interior to prepare legislation which will permit the Trust Territory to enjoy at least the same privileges as American Samoa in regard to exporting canned fish to the United States. While a more liberal United States tariff policy is not a guarantee that offshore commercial fishing will be an important industry in Trust Territory, a continuation of the

present United States tariff restrictions will virtually assure that the industry will never be more than marginal.

Extension of Research Services. The services and resources of the Bureau of Commercial Fisheries and the activities of other United States Government fisheries and marine research organizations should be made available to the Trust Territory.

The United States commercial fishing industry has long benefited from the research of such government organizations as the Bureau of Commercial Fisheries. While a small Trust Territory Government fisheries program does exist and should be expanded, it is unrealistic to suppose that the Trust Territory fisheries program and personnel can perform the multitude of services required at the same level of competence as experienced commercial fishing research organizations.

The Bureau of Commercial Fisheries and other marine research organizations have already indicated some interest in the Trust Territory. It is recommended that the High Commissioner and the Department of the Interior accept and encourage offers of research assistance, while working out the legislative and other arrangements necessary to have these services provided for the Trust Territory on a permanent and continuing basis.

Soliciting External Resources and Providing Infrastructure

Seeking Outside Capital and Management. When information and facilities are available to support such an effort, the Trust Territory Government should set about vigorously to induce major United States producers to expand commercial fishing and fish processing activities in the Trust Territory. Caution should be taken, however, not to begin such an effort prematurely with the almost inevitable result of scaring off good prospects.

While the development of inshore fisheries can probably be accomplished by utilizing local capital and managerial and technical skills, offshore fisheries development will demand that almost the entire expansion be undertaken by foreign firms which are capable of bringing in the necessary quantities of these essential resources. Continual contact will need to be maintained with the major United States producers. As soon as available, information on the availability of the fish resource, of shoreside plant sites, of transportation, communication, and utility services, of other relevant factors of the economic base, and of special arrangements which the Government stands ready to make, will need to be presented to the fisheries firms. The information needed for these presentations will become available only as a result of the research programs recommended below.

Use of this information in "selling" the major fisheries firms on investing in the Trust Territory should be undertaken as a part of the industrial development program which is recommended in Part III of this report.

Providing Needed Infrastructure and Other Inducements. A policy of assistance, including provision of facilities, services, and loans should be established and implemented in an attempt to induce major fisheries firms to face the many uncertainties and inherent risks and costs which they will face in the initial stages of fisheries industry development in the Trust Territory.

In the past, the Trust Territory Government has generally required that any additional infrastructure necessary to the operations of a foreign (United States) firm be provided by the firm. A continuation of this requirement will not permit rapid expansion of the commercial fishing industry in the Trust Territory The high risk associated with investment in the Trust Territory must be partially offset by government cooperation and assistance.

The Trust Territory Government should explicitly assume responsibility for providing docks, water, power and other infrastructure which will be necessary if large offshore fisheries

are to be established. Adequate transportation will be essential. Fortunately, the kinds of policies, infrasturcutre, services, and other facilities and inducements required for the expansion of the commercial fishing industry are generally the same as will be required to support other kinds of economic development. The specific programs designed to meet these needs are presented elsewhere in this report.

Facilitating the Importation of Labor. The Trust Territory Government should encourage, facilitate and assist in the importation of the labor needed to adequately man the fishing boats and to perform other jobs for which local labor is unavailable.

Given the scarcity of population and labor, the high levels of Micronesian wages, the high standard of living provided by the subsistence sector of the economy, and the low levels of productivity of the generally untrained and inexperienced Micronesian workers, an offshore commercial fishing industry cannot be established in the Trust Territory if the industry is restricted to utilizing domestic labor. Imported labor from Okinawa, or elsewhere, must be made available to supplement the domestic labor force.

Even if no Micronesians were employed on the offshore fishing boats, Micronesians would, nevertheless, benefit from

the establishment of the industry. Micronesians would have access to more shoreside jobs created by the industry. They would be able to engage in various satellite economic activities, such as providing goods and services to crewmen and supplies to boats, and the local economies would experience general expansion from the injections of additional dollars and increased money flows.

Government Support of Fisheries Activities

A Trust Territory Department of Fisheries should be established in Trust Territory Headquarters and headed by a professionally qualified Director of Fisheries.

The Fisheries Department should be responsible for conducting Territory-wide programs for conservation, inshore and offshore fisheries development, and marine research. Fisheries development programs need to be undertaken in all districts but with high priority being given to districts with a known or suspected potential.

Although the Trust Territory Government has conducted a fisheries program over the past few years, the emphasis on fisheries development has not been adequate relative to the potential of the area's marine resources and the magnitude of the

problems associated with fisheries development. In the past, the Trust Territory Staff Economist also served as Trust Territory Fisheries Officer. Currently, both of these positions are vacant.

Aside from the Fisheries Officer, the only professional specialist working in fisheries has been the Trust Territory Fisheries Management Biologist who is stationed in the Palau District. Given the size of the budgets, availability of personnel, and the relatively high level of commercial fishing activity in the Palau District, it has been virtually impossible for the Fisheries Management Biologist to give more than superficial and occasional attention to districts other than Palau.

Commercial offshore fishing activity is not likely to be extended to unexplored districts until after the development of the potential in those districts in which commercial quantities of fish are known to exist; assessment of the nature and extent of the fish resources throughout the Trust Territory, therefore, must precede the establishment of new operations, except in the areas of known reserves.

The Long-Term Fisheries Program

The Trust Territory Fisheries Management Biologist, working with the Nathan Economic Development Team, has prepared

and submitted a long-term fisheries development program. While the specifics of the program should be more clearly defined when the Trust Territory Department of Fisheries is established to coordinate and implement the program, this long-term program provides sound general directions and guidelines for fisheries development. The major components of the program are presented in the following subsections to supplement the previous recommendations for the expansion of the commercial fishing industry in the Trust Territory.

Conservation of Marine Resources. A set of comprehensive marine conservation regulations should be prepared and enforced as quickly as possible.

Many traditional methods of fishing, such as fish poisoning and dynamiting, will tend to jeopardize basic marine resources as fishing pressures increase in response to larger and more concentrated populations. Speedy action is needed to avoid such difficulties as those suffered by Guam, where reef areas have become practically barren as a result of dynamiting, poisoning, and other causes.

A conservation regulation enforcement program, in addition to policing and appropriate punishment provisions, should include provisions for conservation education. The preservation

and proper utilization of the marine resources of Trust Territory is essential to maximize the sustained economic benefit from marine resource-based industries in the Trust Territory.

Inshore Fisheries Development. Broad and continuous programs for the technical and economic development of inshore fisheries should be conducted in all districts.

Inshore fisheries development will probably be undertaken by the local people who generally possess only minimal technical skills. Therefore, the improvement in present fishing techniques, the development of new techniques, and the discovery of new resources which may be harvested in inshore areas must be the responsibility of Trust Territory Government.

While technical aspects of inshore fishing should be the direct concern of the Trust Territory Fisheries Department, close liaison between the Fisheries Department and departments concerned with providing financial, business advisory, and marketing assistance (the proposed small business development program, described elsewhere) should be maintained. Business advisory services to fishery cooperatives and private fisheries firms should be recognized as being of as great importance as the purely technical assistance offered by the Department of Fisheries.

Offshore Fisheries Development. In addition to efforts to improve current fishing operations, the Trust Territory fisheries program should be designed to develop new harvesting techniques and new markets for deep water marine products.

Fisheries research must be an important part of the long-range program for offshore fisheries development. By operating experimental vessels, testing new fishing techniques, and exploring new fishing grounds, government offshore fisheries activities can contribute to the growth, productivity and profitability of the commercial offshore fisheries. Economical means of harvesting precious coral, sub-surface tuna and species of marine life which are not currently harvested should be developed to the extent that this is technically feasible. Industry utilization of information and techniques developed by the Fisheries Department can result in an increased number of fishing jobs and higher incomes for fishermen.

Biological and Oceanographic Research. A large-scale program of biological and oceanographic research should be conducted throughout the Western Pacific.

In general, very little scientific information pertaining to the Western Pacific has been gathered. Before the full

potential of the marine resources of Micronesia can be determined, a major research effort will be necessary.

It would be unrealisitc to suppose that the Trust Territory Government could support the entire burden of the required research program. A joint effort by the Trust Territory, the United States Bureau of Commercial Fisheries, and various private and public institutions which have coincidental interests in marine research will need to be organized. Preliminary correspondence and meetings between Trust Territory officials and representatives of several organizations indicate that it may be possible to organize a cooperative effort to establish a marine research center in the Palau District. Although financial support will have to be provided by all the groups involved, in the formative stages of the program, the initiative, the organizational funds, and a minimum physical installation will have to be provided by the Trust Territory Government.

The recommended Trust Territory Department of Fisheries should make a major effort to organize the proposed marine research center and should work with the Fisheries Biologist, who has already done some preliminary work in this direction, to establish the facility as soon as the necessary cooperative arrangements can be worked out. The financial commitment

required of the Trust Territory Government will need to be determined, and the necessary funds will need to be budgeted and made available.

RESOURCE REQUIREMENTS FOR COMMERCIAL FISHING DEVELOPMENT

The ultimate potential for the commercial development of the Trust Territory's marine resources may be practically unlimited over a long-term period; but several years may be required to remove institutional restraints on development. The projections of possible achievements and resource needs presented in this section are made within the framework of the existing impediments and limitations. The expansion possibilities discussed here may appear to be conservative five years hence, but at this point in time they appear to be realistic.

The projections have been formulated on the basis of the following specific assumptions:

1. It is assumed that the Trust Territory Government recognizes the potential of commercial fishing and will pursue a vigorous program for industry development, as recommended in the preceding section of this chapter.

2. It is assumed that even if immediate steps were taken to initiate action which would result in the removal of

United States restrictions on imports of canned fish from the Trust Territory, the five-year planning period would not prove to be long enough for beneficial effects of this action to be fully realized. More extensive proof of the immediate commercial fishing potential in the Trust Territory will probably be required by commercial fishing companies before they will be willing to establish canneries in the Trust Territory.

3. Finally, it is assumed that no radical change will occur in fishing technology during the next five years. It is assumed, however, that the Trust Territory commercial fisheries will adopt the most modern and efficient techniques presently known.

Inshore Fisheries Projections

Given the magnitude of government expenditures and the scope of government programs, it is estimated that 80 percent of the Trust Territory's people will be buying a large percentage of their foodstuffs in the market by 1972. A sizeable market will exist for fresh reef fish. As a conservative estimate, a market for 2,000 to 2,500 metric tons of reef fish will be created by the growth of the district centers. The market value of this quantity of fish will be between $1 million and $1.5 million.

Shoreside facilities, including small-boat docks, reefers, and ice-making machines will require a total investment of between $400,000 and $600,000. The industry will require 50 to 60 boats. Boats and equipment will represent an investment of between $150,000 and $200,000. From 200 to 250 indigenous fishermen can be employed by the inshore fishing industry. Another 50 to 75 jobs for indigenous workers will be created on shore by inshore fishing infrastructure construction and fish marketing and handling activities.

Because of the age and condition of the present inshore fisheries facilities and equipment, it is assumed that the net investment required is approximately equal to the gross investment indicated above. At the present time, although inshore fishing takes place throughout the Territory as a subsistence sector activity, only two districts, Palau and Marianas, have firmly established commercial inshore fisheries. Initial development work will be required in all other districts.

Offshore Fisheries

Given the pattern of development which appears to be most favored by commercial fishing companies, commercial offshore fisheries will probably be established in one district at a time.

The order of development will probably be Palau, Truk, Ponape, and the Marshalls. The development of commercial fisheries in all of these districts may require ten or fifteen years.

The complete development of the Palau fishery established by Van Camp could be accomplished and result in an annual output of between 10,000 and 12,500 metric tons of tuna by 1972. A similar fishery could be established at Truk by 1972, thereby resulting in a total Trust Territory tuna catch of between 20,000 and 25,000 metric tons. The value of the catch could be between $2 million and $3 million.

Most offshore fisheries infrastructure, such as water, power, docks and roads, will have general utility and will be discussed in regard to overall development in other sections of this report. However, some specialized shoreside facilities are required. An expansion of the present freezer plant in Palau and the construction of an adequate plant in Truk will involve investments of at least $750,000.

The present offshore fishing fleet will probably have to be replaced with Hawaiian-style, less labor intensive, fishing boats if offshore fishing expansions are to be feasible. Also, additional boats will be required by expanding operations at Palau and to begin operations in Truk. A net investment of

$3 million to $4 million will be required to obtain the 40 boats needed, 20 each for Palau and Truk.

While the offshore fishing industry can create between 500 and 600 jobs, because of specialized skills required by the industry, at least 10 percent of the jobs will have to be filled by non-indigenous workers, regardless of the domestic supply of unskilled labor.

Research and Conservation

Because a meaningful fisheries research and conservation program can only be formulated by scientists and specialists who fully understand the scope of the problems associated with the investigation and exploitation of marine resources, it is difficult to pre-assess the investment requirement of the research program. On the basis of discussions with industry experts, however, it is estimated that an investment of between $500,000 and $1 million will be required for the needed research facility and equipment. Construction will provide 50 jobs over the five-year period. Some 50 percent of these jobs will require imported labor because of the need for specialized construction skills.

Research and conservation personnel requirements can provide 100 to 150 jobs. At least 25 percent of these jobs will

require a high degree of skill and expertise and, therefore, could not be filled by indigenous workers during the first five years.

Summary of Fishing Industry Development Requirements

The following statements of total commercial fishing resource requirements do not specifically designate resources to be provided by the Government. Many of the investment requirements for commercial fishing in the Trust Territory will be met by privately owned commercial fishing companies. Nevertheless, certain important requirements must be provided by the Government. In particular, research and conservation programs and a properly designed and adequate infrastructure for commercial fishing expansion must be government responsibilities.

Table III

Estimated Net Investment Requirements for Commercial Fisheries Development (Includes Private Investment and Government Investment)
(dollars)

1967 - 1972

Inshore Fisheries:	
Shoreside Construction and Equipment	$ 400,000 - $ 600,000
Fishing Boats and Equipment	150,000 - 200,000
Total	$ 550,000 - $ 800,000
Offshore Fisheries:	
Shoreside Facilities (Freezer Plants)	750,000 - 1,000,000
Fishing Boats and Equipment	3,000,000 - 4,000,000
Total	$3,750,000 - $5,000,000
Research and Conservation:	
Marine Laboratory, Boats and Equipment	500,000 - 1,000,000
Total	$ 500,000 - $1,000,000
Total for all Commercial Fishing:	$4,800,000 - $6,800,000

Table IV

Estimated Labor Requirements for Commercial Fisheries Development (Includes Managerial, Technical, Skilled, Semi-Skilled and Unskilled Labor) (Numbers of People)

1967 - 1972

	Indigenous Labor	Non-Indigenous Labor
Inshore Fisheries:		
Construction	25 - 50	25 - 50
Operations	250 - 300	10 - 25
Total	275 - 350	35 - 75
Offshore Fisheries:		
Construction	25 - 50	25 - 50
Operations	450 - 500	50 - 100
Total	475 - 550	75 - 150
Marine Research and Conservation:		
Construction	25 - 50	25 - 50
Operations	75 - 100	25 - 50
Total	100 - 150	50 - 100
Total for all Commercial Fishing:	850 - 1,050	160 - 325

CHAPTER SEVEN

MANUFACTURING, PRIVATE SECTOR CONSTRUCTION, WHOLESALE/RETAIL TRADE, SERVICES

This chapter contains discussions of private sector industries and economic activities which, because of their current relative size and importance, do not warrant treatment in separate chapters. Further, the problems which beset these industries and activities are general in nature and can be best understood in the context of discussions which emphasize the broad range of these problems.

Although all of the industries and activities discussed in this chapter--manufacturing, private construction, wholesale/retail trade, and services--have grown as government expenditures and activities have grown over the years, none has matched the growth rate of the Government.

Each of the industries and activities (manufacturing, construction, trade, and services) is described and analyzed, and the general potential for expansion is identified in the first four major sections of this chapter. The recommendations and suggested programs and the projected expansion possibilities and resource needs of the industries and activities are included in the last two major sections of this chapter.

MANUFACTURING

Manufacturing activities in the Trust Territory are largely confined to cottage type industries in the subsistance sector. The few activities which are directed toward production for the market economy are characterized by inadequate capitalization, poor management, and an untrained labor force. Trust Territory manufacturing activities in both the subsistance and market sectors are described and analyzed below.

Current Manufacturing Activities in the Trust Territory

Manufacturing and processing activities in the Trust Territory today are relatively insignificant and mostly consist of production by craftsmen of such things as boats, fish nets and spears, traditional furniture, implements, baskets, mats, clothing, and other items for local use. There is also limited production of handicraft items for sale to Trust Territory Government employees and their families, military personnel, and others who visit or pass through the area. The following discussions of boatbuilding, furniture manufacturing, and handicraft production indicate the scale and scope of organized manufacturing activities in the Trust Territory.

Boatbuilding. Not surprising for an island economy, boatbuilding is a widespread economic activity in the Trust Territory. Almost every community has one or more boatbuilders. With the exception of the activities of the Palau Boatyard, discussed below, boatbuilding is unorganized and is carried on by individual craftsmen who work in small sheds or shops, or in their own homes.

Generally, the boatbuilder is an individual who has, for one reason or another, greater carpentry skill than his neighbors. As a result, if a boat is needed in his community, he is given a labor contract by the individual desiring the boat. The prospective boat owners will furnish materials or give the boat-builder funds to acquire them. Quite often, the production schedule is stretched over many months, as materials can only be obtained as the prospective owner acquires necessary funds. The quality of workmanship varies, depending on the individual skills of the craftsman.

Prior to and during World War II, the Japanese constructed boatbuilding and drydocking facilities in Palau. Unfortunately, these facilities were almost completely destroyed by military action in the area, and by the scrap collectors who were active

in Palau immediately after the war. In 1962 a boatbuilding cooperative, the Palau Boatbuilders Cooperative Association, was organized to reconstruct the Palau Boatyard. It was the intention of the Cooperative to build boats and provide drydocking facilities for the commercial fishing industry which was under consideration for Palau at that time. For a variety of reasons, including poor management and insufficient capitalization, the Cooperative was unable to complete the reconstruction project. Finally, the Trust Territory Government assumed responsibility for completing the reconstruction of the boatyard as a "pilot project."

At the present time, the boatyard and all equipment are owned and maintained by the Trust Territory Government. It is estimated that the value of the total plant exceeds $100,000.

Because there were no Micronesians with industrial boatbuilding experience, in 1963 the Trust Territory Government employed a boatbuilding specialist, a Japanese-American from Hawaii, to work in the yard. For a nominal rental, the boatyard and the boatbuilding specialist are made available to the boatbuilding cooperative. Approximately 30 people are currently employed in the boatyard.

During 1965 the gross sales of the Palau Boatbuilders Cooperative Association amounted to slightly less than $30,000.

Hidden and direct subsidies are estimated to have been approximately $40,000. Net profits, to the extent they could be determined, amounted to approximately $5,000. Because the Government has contracted with the Cooperative for a 75-foot commercial fishing boat, gross sales for fiscal year 1966 probably approached $100,000. Government subsidies probably equaled this amount.

Two basic problems associated with the boatbuilding operations in Palau are: (1) inexperienced management, and (2) the means by which subsidies are paid. The Palau Boatyard is managed by the Trust Territory Fisheries Management Biologist. While the boatbuilding specialist is a skilled technician, he is not able to assume managerial responsibilities because of his limited ability to speak English and his lack of managerial experience. The experience of the Fisheries Management Biologist as a boatyard manager is also limited.

For various reasons, the Trust Territory Government has never budgeted subsidies for the Palau Boatyard. The only budgeted item for boatbuilding is the salary of the boatbuilding specialist. Most of the subsidization is provided from the budget for the Trust Territory Fisheries Department in the form of executive services and labor. Some funds have been transferred

from the Fisheries Department to the Palau Boatyard for inventories.

The economic feasibility of a boatbuilding facility in Palau is questionable. Assuming that basic inefficiencies resulting from poor management and an unskilled labor force can be remedied over time, distances from sources of supply, high labor costs, and transportation costs may be handicaps which can never be overcome. The market for boats in Palau is limited and unable to support a boatyard of this size at the present time. It is necessary, therefore, to produce boats for other districts in order to maintain a reasonable scale of production. Competition offered by Japan, Hong Kong, and other boatbuilding areas in the Far East, in both quality and price of boats, is substantial. Also, boats constructed by local boat-builders who have virtually no overhead are available in each district.

Furniture Manufacturing. The Palau Handicraft and Woodworkers Guild was formed in 1962 as a producers cooperative. Although the initial aim of the Guild was to standardize the quality of handicrafts, and to facilitate a smooth flow of handicraft production in order to develop handicraft markets,

the demand for school furniture to meet the needs of the accelerated education program prompted the Guild to start furniture-making operations. With the technical assistance of Trust Territory personnel, and economic development loans amounting to $25,000, the Guild was able to obtain a contract from the Trust Territory Government to manufacture furniture valued at over $100,000. Because of the difficulties encountered in fulfilling such a large contract, the contract was later reduced to $50,000. Until recently, about 20 persons were employed by the enterprise. Upon completion of the contract, which lost approximately $25,000, furniture manufacturing operations were suspended. The Guild is now bankrupt.

Because of lack of experience, and because of a Trust Territory Government ruling disallowing formal assistance in preparing the original bid, the bid prices submitted by the Guild were considerably below the prices which would have been warranted by any reasonable estimate of production costs.

While production costs, under the best circumstances, would have probably been much higher than the Guild's estimates, managerial inefficiency aggravated the Guild's problems. Personnel were not trained to work under factory conditions, no formal accounts were maintained, little quality control was exercised,

production scheduling was haphazard, and raw material delivery delays were not taken into account. It was virtually impossible for the Guild to meet contractual delivery dates.

There is very little likelihood that the Guild will be able to obtain another contract from the Trust Territory Government. While the Government is sympathetic to the problems of the Guild, delays in the delivery of furniture cause delays in opening schools. At the moment, education programs are given very high priority and some officials have serious reservations about sacrificing portions of the education program in order to promote other activities.

In regard to other possible furniture markets, the Guild has attempted to produce some household furniture for the local Palauan market. Because of the small size of the local market, and because of the Guild's inability to design, produce, and market furniture at competitive prices, it is almost certain that the furniture manufacture venture in Palau will not survive unless government subsidies and continuing technical assistance can be provided.

Aside from the production of furniture on a custom order basis by individual craftsmen in the Trust Territory, the only other furniture manufacturing activities at the

present time occur on Saipan, in the Marianas District. The Micronesian Construction Company, located at Saipan, has been awarded school furniture contracts calling for the delivery of furniture valued at approximately $200,000. Unlike the Guild, Micronesian Construction Company did not attempt to manufacture the furniture locally. Rather, the Company subcontracted to a Taiwanese firm which ships unassembled furniture to Saipan where it is assembled by Micronesian labor. All reports indicate that the contract has proved to be reasonably profitable for the Micronesian Construction Company and that furniture has generally been delivered on schedule.

Handicraft. Handicraft items may be defined as manufactured items which are traditional in a society, or which are produced by indigenous artisans and craftsmen who utilize techniques of production which are basically traditional. In the broadest sense, handicraft may have aesthetic and/or functional value. Articles may be produced for specialty markets in which there are buyers who desire the articles as representations of native skills, as souvenirs, or for uses other than the use for which the articles were originally designed. It is important to note, however, that in an area such as the Trust Territory, handicraft articles are often

produced to serve as useful items in the everyday lives of the indigenous population. The handmade canoe, the woven mats and bags, the grass skirts, while admired as colorful or well made articles by the observer from a more sophisticated economy, may be useful and, indeed, essential to the society in which they are produced.

In the Trust Territory, as elsewhere, as the various societies have developed money economies, and as mass produced and superior substitutes have become available, many articles formerly manufactured by skilled local craftsmen have fallen into disuse. While some of these articles are still produced for sale as curiosity pieces, in many cases the handicraft articles are replaced by imported substitutes. Consequently, the local artisans and craftsmen lose their markets and their skills.

While handicraft production is still important in some of the isolated societies of the Trust Territory, improvements in transportation, increases in the opportunities to obtain money income, and changes in social values will result in a declining reliance on handicraft articles in the future. Generally, imported manufactured goods are superior to handicraft articles in quality, have greater utility, and, if opportunity costs of craftsmen are

greater than zero, are cheaper. For these reasons, Trust Territory handicraft industries will probably only survive if other than traditional markets exist.

During and after World War II, the demand for souvenirs by military personnel and foreign administrators, and a small demand by exporters, provided nontraditional markets for handicrafts. Although those markets have not been sufficiently large to stimulate much handicraft activity in recent years, they were relatively important at one time. As late as 1949, annual handicraft sales in the Trust Territory still amounted to more than $100,000. At the present time, handicraft sales are estimated to be approximately $50,000 per year.

The formal marketing outlets for Trust Territory handicrafts are the trading companies in each district, the Micronesian Handicraft Center at Kwajalein, the Micronesian Products Center at Guam, the Palau Woodworkers and Handicraft Guild, the Ponape Women's Association, and the Majuro Women's Association. In addition to selling their handicrafts to the wholesalers and retailers listed above, individual craftsmen often sell their products directly to local American residents and to visitors who are passing through the districts. Virtually all dealers in Trust Territory handicrafts complain that present output is

inadequate in both quantity and quality to allow the development of any sizeable or dependable market.

Three basic problems appear to be the main causes of limited handicraft production in the Territory. First, external markets (export markets) have been difficult to exploit because of intense competition by the crafts products of other exotic cultures and because of United States tariffs imposed on Micronesian products.

Second, the high wages established by the Trust Territory Government have resulted in a Territory wage pattern which makes it difficult to induce skilled labor to produce handicrafts.

Finally, inadequate organization and poor management in terms of design, quality control, and production have contributed to the ineffectiveness of cooperatives and other organizations established to market handicrafts.

It is not likely that handicraft production will ever have a significant impact on the total Trust Territory economy. Yet, some basic improvements in production and marketing techniques and the removal of the United States import restrictions on handicrafts would allow handicraft production to contribute to the support of a limited number of Micronesians.

Impediments to Manufacturing Industry Development

The quantities, qualities, and distribution of the scanty manufacturing resources of the Trust Territory would seem to assure that manufacturing industries relying on domestic raw materials and labor resources will be extremely difficult to develop. Development is inhibited by distances, infrequent and costly transportation, shortages and high costs of labor, import duties on Trust Territory products entering United States markets, scarcities and high cost of almost all kinds of supplies and materials, and limited availability and dependability and high cost of power, water, communications, buildings and other facilities.

Even assuming the feasibility of importing raw materials and labor, total production costs and low volume of output would effectively preclude Trust Territory's manufactured exports from competing in world markets with goods manufactured in countries which enjoy more favorable manufacturing resources.

It is even more difficult to visualize domestic markets capable of supporting manufacturing industries at feasible scales of production. The characteristics of the domestic markets in the Trust Territory would appear to preclude most types of

manufacturing. It is doubtful that tariffs, quotas, and other import restrictions which might be imposed to exclude competition from foreign goods would have any significant effect, other than to raise living costs and lower living standards of most Micronesians.

Possibilities for Expansion

Even with all of the existing difficulties, there seem to be some manufacturing possibilities worthy of investigation; particularly in the case of processing local raw materials, especially foodstuffs and food products, and in the few cases in which import substitutions may be possible. For example, canning or freezing of fish, fruit, and vegetables may become more feasible as the American resident population expands with a rising government budget and with the arrival of the Peace Corps volunteers. The interest of a large American industrial firm in using the Trust Territory as a base for the processing of foreign and domestic copra should be explored carefully and pursued if feasible. Also, the development of tourism can be expected to stimulate the production and sale of handicrafts.

CONSTRUCTION INDUSTRY

In terms of immediate potential, the construction industry has as much promise as any industry in the Trust Territory. The demands for construction by both the government and private sectors can provide a basis for developing the private sector construction industry organization and skills which are essential to any viable economy.

Survey of Construction Activities

Over the term of the United States administration of the Trust Territory, the government sector has been responsible for almost all construction activity in the Territory. Further, given the current and proposed government construction programs, it is most likely that the Trust Territory Government will continue to sponsor and finance the major portion of construction projects in the foreseeable future. While the dearth of private sector data makes it impossible to determine accurately the amounts of current private sector construction in the Trust Territory, it is estimated that at least 95 percent of total construction activity occurs in the government sector. Trust Territory Government expenditures for noncontracted construction over the

years 1960-1966, are shown in Table I. While noncontracted construction amounted to approximately $9.5 million over the seven year period, total construction amounted to about $14 million.

TABLE I

Trust Territory Government
Expenditures for Noncontracted Construction*

Fiscal Years 1960-1966

Year	Expenditures
1960	$ 523,713
1961	599,308
1962	1,037,011
1963	617,161
1964	2,553,046
1965	443,086
1966	3,753,544
TOTAL	$ 9,526,869

* Contract construction over the same period amounted to approximately $4.5 million. The bulk of such contracts were for school and teachers' housing (approximately $3.3 million), and for the Saipan hospital ($685,000).

SOURCE: Trust Territory Department of Engineering Planning.

Government Force Account Construction. Prior to the budget increase in 1963, virtually all Trust Territory Government construction was dependent on the Public Works Department's personnel and equipment. Individual construction projects, authorized within the framework of the extremely limited budgets, were generally of such small scale that it was not feasible for private contractors to bid on them. On the one hand, the small scale did not allow private contractors to take advantage of economies which result when projects are large enough to warrant vessel charters in order to reduce freight costs. On the other hand, given the nature of the Government's budgeting procedures, many of the actual costs of Public Works Department construction projects were hidden, and it appeared that the work could be more economically performed by the Government.

Since 1963 a conscious attempt has been made by the Trust Territory Government to contract most construction work. The Public Works Department does not have the skilled personnel or the range of specialized equipment required for specialized construction projects. It does not and cannot maintain a standing force which may be assigned to construction projects as they arise. Each new project demands that men and machines be diverted from some other

task. Presently, approximately 50 percent of current Trust Territory Government construction work is performed by private contractors.

Government Contract Construction. The ability of the Trust Territory Government to contract construction work has been limited by the sizes of construction contracts and the availability of private contractors. Guamanian construction firms have generally been unwilling to bid on projects involving less than $200,000. More distant contractors, from Hawaii and Japan, have indicated that projects of less than $1 million are not economically feasible for them to undertake. Because most Trust Territory construction projects have involved amounts of less than $200,000, and a very few have exceeded $1 million, most government construction work has been left to Micronesian construction firms and to the Trust Territory Government Public Works Department.

While a few privately owned indigenous construction firms perform contract construction work, including some residential and commercial construction, most indigenous contractors operate part-time construction businesses which have extremely limited resources. These contractors do not possess heavy-duty and specialized equipment and, generally, do not have access to skilled labor.

At the present time, in only three of the six districts of the Trust Territory--Marianas, Palau, and Ponape--are there general contractors considered by the Trust Territory Public Works Department to be capable of successfully carrying through on construction projects involving more than $10,000. To the greatest degree possible, construction work has been given to these contractors in the three districts. At best, however, a considerable period of time will be required before indigenous contractors will be prepared to assume the responsibility for major construction.

Construction Demand

Both the government and private sectors may be expected to provide the construction demand which can stimulate the development of privately owned construction companies. Government construction demand will be based on the construction requirements of government programs and activities, such as schools, hospitals, and administration buildings, and on the need for the Trust Territory Government to provide specific and general infrastructure facilities.

Specific infrastructure facilities will be constructed to meet specific needs of the various economic sectors. For example, airfields must be constructed for air transportation and docks must be constructed for logistic sea transportation. General infrastructure facilities, such as roads, power and water facilities, and communications facilities must be constructed to support both government activities and private sector activities.

Wholesale and Retail Trade

Trade is presently the largest and most important economic activity in the private sector of the Trust Territory economy. With the exception of government employment, trade provides the major portion of jobs and money income to Micronesians living outside the subsistance sector. Approximately 2,000 Micronesians are employed for wages in trading activities.

After World War II the United States Government-owned United States Commercial Company, and later the Island Trading Company, conducted almost all trade in the Trust Territory. Because the Island Trading Company (after it replaced the United States Commercial Company in 1948) had been conceived as a wholesale firm to serve indigenous retailers, an effort was made by the

Company to establish retail trading companies, owned and managed by Micronesians, in each district. By the time the Island Trading Company was phased out in 1954, the Micronesian trading companies were generally regarded to be sufficiently mature to engage in wholesaling as well as retailing activities.

With the exception of the Marianas District, which was under United States Navy jurisdiction until 1963, indigenously owned trading companies were established by the Island Trading Company in each district. These enterprises were set up as joint stock companies or as cooperatives. The limited capital of individuals in the Trust Territory demanded that stock holdings be broadly distributed. Regardless of stock distribution, however, because of the traditional cultures, actual control of the companies in most districts fell into the hands of the hereditary community leaders.

While the growth of trade activity in most districts has resulted in an increase in the number of trading companies, the competitive edge enjoyed by the original companies has generally tended to keep new companies from growing very rapidly. The original companies have two very important competitive advantages.

First, because the companies have broad ownership and are controlled by powerful local political leaders, they seek and are

generally granted special consideration by both the local governments and by the Trust Territory Government. No matter how badly they may have been managed, the trading companies have always felt assured that the Trust Territory Government would not allow them to go into bankruptcy. Political considerations have appeared to the Trust Territory Government to demand that the hereditary leader/managers of the companies maintain their status and reputations, almost irrespective of their actions.

Second, the original companies are the only holders of copra licenses in most districts. The copra licenses, which are issued to a total of eight companies in the Trust Territory by the Copra Stabilization Board, authorize the companies to sell copra to the Stabilization Board. Only the Copra Stabilization Board may market copra outside the Trust Territory. While the small nonlicensed companies may buy copra directly from the small producers, they may only sell to the eight companies which hold licenses.

The copra profit margin enjoyed by the licensed copra dealers is regulated and relatively modest; the advantage which the license holders have over competitors is not directly related to copra sales and purchases. Rather, their copra transactions, which probably do little more than cover direct costs of visiting

the outer islands for copra pickups, allow them to sell trade goods on the outer islands. It is this subsidiary activity which provides the major portion of trading company profits. The companies are able to handle trade goods at no marginal costs or, at least, at very small marginal costs. Moreover, they are on hand at the point in time when the outer island people receive cash from copra sales. The latter point is very important in a society where little or no cash saving occurs. Not only do the copra license holders generally operate without competition in dealing with outer islanders, but they frequently use their monopoly positions to set exceptionally high prices on trade goods.

While the original trading companies which hold copra licenses are the "giants" of trade in the Trust Territory, other wholesale/retail companies have formed. In areas where copra is relatively unimportant, some of these companies have been quite successful.

Large numbers of very small retail establishments operate in the Territory. For the most part, however, the only reason for the existence of these establishments is to purchase goods for extended families at wholesale discounts. Retail business licenses, granted at very low cost, entitle the holders to purchase goods from wholesalers at 10 to 15 percent discount.

It is estimated that there are perhaps 600 to 700 small, part-time retail establishments scattered throughout the various districts. The exact number has varied considerably from year to year.

In Table II the number of trading companies in the Trust Territory at the end of fiscal year 1965 are categorized by their scope of business operations. Omitted from the table are those small retail establishments which are literally "family" stores.

TABLE II

Import, Export, Wholesale and Retail Firms Conducting Business in Trust Territory on June 30, 1965

Type of Business	Number of Firms
Import, Export, Wholesale, Retail	29
Import, Wholesale, Retail	10
Import, Wholesale	1
Import, Retail	24
Export, Retail	3
Import, Export	2
Export	5
Retail	19
TOTAL	**93**

SOURCE: 18th Annual Report to the United Nations.

The size of the trade sector is indicated by the levels of non-government imports and exports of the Trust Territory. The major growth factor has been the multiplier effects of increases in Trust Territory Government expenditures. Prior to 1963, imports were relatively constant. Since 1963, the first year of significant increases in Trust Territory Government expenditures, imports have been increasing steadily. Exports, of course, consist almost entirely of copra. Imports and exports, from 1961 to 1965, are shown in Table III.

TABLE III

Trust Territory Imports and Exports
Fiscal Year 1961-1965

Year	Imports	Exports
1961	$4,560,115	$2,130,384
1962	4,138,620	2,125,264
1963	5,029,208	2,161,483
1964	5,686,585	2,644,105
1965	7,090,916	3,152,459

SOURCE: 18th Annual Report to the United Nations.

Impediments to Trade Development

Basic problems have prevented trade from developing as rapidly as the basic economic situation of the Trust Territory might have warranted. Unless these basic problems are resolved, trade development will continue to be impeded. The following subsections present an analysis of each of these major impediments.

Monopoly Trade. The economic virtues of competition have not been significant factors in formulating Trust Territory trade policies. Political considerations have had a much more profound impact. In addition, there has been a genuine paternalistic desire on the part of policy-makers to protect infant Micronesian businesses.

Under the provisions of the Trust Territory Code, business licenses, particularly for non-Micronesians, have been issued in accord with the assumed ability of local populations to provide needed business services. With few exceptions, it has been assumed that local Micronesians could provide all trade services within any district. Until the recent agreements with Mobil Oil Company to wholesale and retail petroleum products in the Trust Territory, and with Micronesian Shipping Lines to provide logistic services,

only those non-indigenous firms which were in the Trust Territory at the beginning of the United States Administration, and which were not associated with the Japanese Administration, have been allowed to conduct trading activities.

Not only has competition from outside been absolutely prohibited, but competition between and among Micronesian businesses has been virtually prohibited. By maintaining local land tenure systems, by failing to prevent local discrimination in the districts against Micronesians from other districts, and by supporting local companies which hold district copra licenses, regardless of how poorly they may have been managed, the Government has effectively discouraged competition among Micronesians both within and between districts.

Given the small populations, the traditional political structure, and the limited number of enterprises in the various districts, competition would be difficult to engender in the Trust Territory under the best circumstances. Unless steps are taken to stimulate competition, the residents of the Territory will continue to be deprived of needed goods by being required to pay high monopoly prices.

Commercial Credit. One of the most serious problems for trading companies in the Trust Territory has been their inability to obtain adequate short term credit. While both the Bank of America and the Bank of Hawaii have facilities in the Trust Territory, banking services available to trading companies are minimal.

At the present time most trading companies obtain credit only on goods "in transit." Sight drafts are presented for payment before goods are actually released to the consignee companies. With a few exceptions, inventories of trading companies in the Trust Territory must be maintained by cash outlays. Further, because of inadequate credit institutions, the large wholesale trading companies are often forced to extend credit to their retailer customers. The result of this situation is that most firms face a chronic problem of inadequate liquidity.

There are two main reasons why Trust Territory firms have difficulty in obtaining and maintaining adequate lines of credit. First, and perhaps most important, most firms in the Trust Territory are not properly managed. Lack of proper accounting procedures, for instance, results in the inability of potential creditors to evaluate the financial soundness of the firms.

Second, because of interpretations of the Trust Territory Code, real estate in the Trust Territory may be held only by Micronesians. This situation, combined with the Trust Territory Government's cautious attitude toward any outside firm which may seek to recover losses by attaching the property of a Trust Territory firm, understandably makes most outside businessmen, including the bankers who maintain banking facilities in the Trust Territory, extremely conservative about extending credit. Bankers generally demand Government guarantees for loans made to Trust Territory firms and businessmen.

The Trust Territory Government has on many occasions assisted outside businessmen, in an informal manner, in collecting monies owed by Trust Territory firms. Indeed, some Guamanian firms have consistently extended credit in the Trust Territory on the assumption that the Trust Territory Government will stand behind the trading companies. Unfortunately, most Trust Territory suppliers are further removed from the Territory than are the Guamanian merchants, and are unwilling to accept such informal guarantees as security.

Managerial and Other Skills. The Trust Territory Government has need for a large number of literate Micronesian employees. Given the great geographic spaces to be administered, the need to

establish what are basically six separate governments, and the increasing commitment to provide social services, this need is not surprising. Further, considering the wage policy of the Trust Territory Government and the prestige associated with government employment, it is not surprising that the Trust Territory Government has tended to employ most of the better educated Micronesians. These factors have resulted in a continuous drain of the more capable and better educated Micronesians from the private sector into government employment. That this drain will continue is indicated by the fact that the Department of Education will provide teaching jobs for most of the people who graduate from high school during the next several years.

The lack of educated and willing managers is reflected by the state of trade in the Territory. Virtually, all private companies are aware of the competition for capable people presented by the Government. Until this problem is satisfactorily solved, the development of trade will be seriously impaired.

Evaluation of the Trade Potential

If the present Trust Territory budget plans are followed, wholesale and retail trade expansion will be greatly accelerated.

Trade expansion will stimulate greater profits which will justify and provide sources of funds for new investments by trading companies. Opportunity will also be provided for expanding at lower cost the volume and the variety of goods available to all Micronesians, particularly to those on the outer islands. The contribution of increased trade to living standards and to various other kinds of economic develcpment can be substantial. The degree of progress achieved will be determined by Government policy in regard to questions of competition within and between districts, Trust Territory Government wage policy, and restrictions on the immigration of foreign capital and labor as discussed elsewhere in this Plan.

Services

The quality of services in the Trust Territory is generally low. This results from inadequate training programs, the low standards of performance frequently accepted by the Trust Territory Government, an absolute shortage of labor, and thin markets for some classes of services.

Individual Services

For the purpose of this discussion individual services are defined as private direct services provided on an individual basis. Such services include, but are not restricted to, household services,

barbering and cosmetic services, and private repair services. Many other activities which might be regarded as individual services have been discussed under other headings in this report. Services sponsored by Government, and those directly associated with industries analyzed in other chapters, are not discussed here.

Household Services. Private households (primarily non-indigenous) provide employment for approximately 500 Micronesians. Most of these people, of whom approximately 450 are women, work as maids and gardeners. While work practices and wages vary from district to district, the normal work day for household employees is 8 hours and wages are approximately the same as the basic Trust Territory Government rate for unskilled labor. Work hours generally coincide with Trust Territory Government work hours.

Except for areas where substantial numbers of Americans have been in residence for prolonged periods, such as Saipan, household employees familiar with western housekeeping tasks are relatively scarce. Trained cooks, capable of preparing and serving western foods, are a rarity.

In the places where the demand for household employees is greatest, such employees are in relatively scarce supply. As

might be supposed, these are the places which also provide the greatest number of other employment opportunities, particularly government employment. The problems of labor supply are aggravated by the immobility of labor between districts.

Professional Services. Limited professional services such as medical and legal services are made available to the general public by the Trust Territory Government, either free or for a token charge. The quality of these services is generally low.

Because of the increasing demand for professional services, there are many employment opportunities in medicine, law, education and other professional fields. Virtually all of these employment opportunities are in government service. At the present time, there are only two lawyers in private practice in the Trust Territory. Both are located in the Marianas District.

As the private sector develops, demands will increase for a broader range and higher quality of professional services. It is doubtful that the Trust Territory Government can or should provide all of these services. As economic activity expands, an effort should be made to facilitate the development of private professional services in the Trust Territory.

Other Individual Services. While a few Micronesians are employed full time in performing services such as barbering and the minor repair of appliances, such employment is generally carried on as a "side line" by government employees. Most repair services in the Trust Territory are performed for the general public on a reimburseable basis by the Trust Territory Public Works Department. Because government work is given high priority, private individuals often hire government maintenance employees during off-duty hours.

In recent years, as the number of American residents has increased and Micronesian incomes have increased, some trading companies have diversified and now offer various services formerly provided by the Government. Because these companies must compete with a high wage, high prestige government employer, and with government services provided on a reimburseable basis, many of the ventures have had very limited success. Mechanics and other skilled workers generally prefer government employment, and consumers of services generally prefer the more dependable and relatively low-cost government services.

Institutional Financial Services

While some foreign financial institutions provide services to Trust Territory residents and businesses from Guam, the United

States, and Japan, such services are necessarily limited because of transportation and communications difficulties. For the most part, the financial services available to most Micronesians are the limited services which are offered locally.

Insurance. With the exception of two firms located on Saipan which act as brokers for large international insurance companies, there are no insurance services in the Trust Territory. All insurance must be obtained from Guam. It is not without significance that Guamanian actuarial statistics are used as a basis for computing premium rates. Guam is in the middle of a typhoon belt, has a relatively large military population, and is characterized by other features which result in extraordinarily high premiums. Because of this situation, insurance is usually purchased by Trust Territory residents and businesses only when it is required as a condition of credit.

Banking. While one facility of either the Bank of America or the Bank of Hawaii is located in each district except Yap, these facilities offer a very limited range of banking services. Facility managers have no authority to grant loans. All loan applications are processed in Guam or Honolulu. As has been noted elsewhere, the banks are extremely reluctant to make nonguaranteed loans in the Trust Territory.

The Bank of America facilities do not even maintain the accounts of local depositors. All checks are cleared through the Bank of America branch in Guam. On the whole, these Trust Territory banks perform few services other than to receive deposits and introduce currency into the local economies.

Credit Unions. The Trust Territory Government has devoted considerable effort to organizing credit unions. At the end of fiscal year 1965, there were 21 credit unions in the Territory. These institutions had total assets amounting to approximately $190,000 and loan balances amounting to approximately $165,000.

A major weakness of the credit union program is the large number of small credit unions which serve extremely specialized groups of members. In Palau, for instance, four different credit unions have been established to serve government employees. Even though efforts are now being made to consolidate some of them, past policies which encouraged credit union proliferation have been difficult to overcome.

It must be pointed out that despite all of the problems besetting credit unions, these institutions have proved to be relatively successful in providing consumer credit to Micronesians. However, to the extent that the credit unions cause savings to be

diverted from institutions offering commercial credit, and encourage consumer spending, as opposed to investment spending, they are less desirable than other types of financial institutions in a developing economy such as the Trust Territory.

RECOMMENDATIONS AND SUGGESTED PROGRAMS

The industries and activities discussed in this chapter account for most of the non-agricultural and non-government employment in the Trust Territory. Further, because the development of a viable private sector will depend to a significant extent on the growth of these industries and activities, they should be the major beneficiaries of many of the policies and programs designed to assist small business; to stimulate industrial development; to provide vocational education and training; and to encourage the importation of needed resources, such as capital, management and labor. The many problems which now beset these industries and activities must be solved before meaningful and equitable economic development will be possible in the Trust Territory.

The problems of manufacturing, construction, trade and services are both general and specific in nature. On the one hand, all are intimately affected by the general environment and the general conditions which determine economic development possibilities

in the Trust Territory. On the other hand, each is affected by specific problems which must be solved if the full potential of the individual industry or activity is to be realized.

In order to stimulate the expansion of manufacturing, construction, trade and services, the Trust Territory Government should implement the policy recommendations presented in Part I of this report, and the program recommendations presented in Parts III and IV. These policies are designed to create a favorable environment for economic development, and these programs are designed to provide the capital, management, labor, and infrastructure development needs of the private sector.

While the general policies and programs apply to virtually all industries of the private sector, each industry and activity has unique problems which must be given separate consideration. Special programs must be established to assist each of the industries to realize as fully as possible its potential for healthy expansion and growth.

Manufacturing

It is important that the few manufacturing activities now conducted in the Territory be given all reasonable assistance, and that constant vigilance be maintained in order to detect and

exploit new manufacturing opportunities as they may arise. Because of the Trust Territory's poor endowment of manufacturing resources, it is not likely that manufacturing will be a very important economic activity in the foreseeable future. Yet there are actions which should be taken to maximize the admittedly small potential.

Subsidies and Pilot Projects. In addition to providing manufacturing industries with technical and managerial assistance, and assistance in obtaining capital, it is recommended that a system of subsidies be considered for infant industries which have obvious potential but which face extraordinary problems of production, sales and marketing during the initial stages of operation. For manufacturing industries which appear to have potential but which face such high risks that private development appears to be infeasible, it is recommended that government-sponsored pilot projects be established to determine the limits of the potential and to carry the projects through the initial stages of development. At such time as the projects are determined to be self-supporting they may be released to the private sector.

Industry Organization. In assisting new manufacturing industries, care must be taken to determine the appropriate form of business organization for the individual firms. While the

cooperative form of organization may be useful in procuring raw materials for and marketing the products of individual handicraft workers, such an organization may be inappropriate for products produced under factory conditions. Manufacturing organizations should be adapted to the type of product produced and the conditions of its production and sale.

Construction

Because the rapid growth of construction demand in the Trust Territory seems assured, immediate steps should be taken to initiate sizeable vocational education and training programs to teach construction skills in all district centers. Technical and financial assistance should be made available to Trust Territory contractors in order to ensure their greatest possible participation in the rapid growth of this industry.

Apprenticeship Programs. While formal vocational education programs can provide basic skills and orientation, these programs cannot produce workers who will possess the high degree of skill and

the industrial discipline which the economic development of the Trust Territory will demand. Formal apprenticeship programs are required to provide vocational school graduates, and others, with intensive and carefully supervised on-the-job training.

A program should be established within the context of the Micronesian civil service program which will provide for regulated job progressions for government construction employees. On-the-job experience, part-time classroom instruction, and rigorous testing and evaluation of performance should be established as the rigid criteria for awarding job titles and promotions.

Methods must be devised to ensure and regulate the progressio of private sector construction workers through the various levels of skills. Because most construction work will be performed under contract with the Trust Territory Government, private contractors should be required to provide proof of the competence of their construction crews. Contracts should be broken down to indicate the various skills of workers. Contract prices should be based on these skills. If a contractor, in preparing his bid, indicates that he will use a given number of skilled carpenters, he should be required to prove that the workers really possess such skills.

As a means of establishing standards, skilled workmen who complete a formal vocational program and/or have a minimum amount of on-the-job training, and who are capable of demonstrating their skills under formal testing conditions, should be certified by the Department of Education. Such certification could be the basis of proof of employee competence submitted by private contractors seeking government contracts, and the basis for establishing pay grades and granting promotions for government employees.

Wholesale/Retail Trade

The domination of trade by the relatively large trading companies in most districts, and the concentration of Micronesian managerial talent in these companies, has created two serious problems. First, the lack of competition in the districts allows the companies to be relatively inefficient and make unjustified monopoly profits. Second, the companies tend to have proprietary feelings about all business activities in their districts. In some cases the companies have diversified to the point where the strain on their managerial abilities has jeopardized their financial structures. To a large degree, both of these problems are the result of government policies designed to restrict opportunities to firms that are indigenous to each district.

Competition. While "cut throat" competition would undoubtedly be detrimental to private sector development in the Trust Territory, it must be recognized that healthy competition is the best teacher of business efficiency and the best inducement for high standards of performance at reasonable prices. Further, while controls are sometimes necessary, the general public will be best served and the standards of living in the society will be highest if controls on competition are held to a minimum.

Interdistrict Competition. Because of the local cultures, the traditional political and social class structures, the limited populations, and the limited number of individuals who possess entreprenueral abilities in each district, it is probable that the number of successful indigenous enterprises organized within any given district will be small. These enterprises will generally be established by the most capable people, who generally will have acquired much of the available capital in the district.

The need for competition should not be interpreted as requiring government discrimination against these successful enterprises in order to compensate for advantages which they may have over other, less successful enterprises. Rather, policy should be directed toward stimulating competition between equally successful, well-financed and well-managed firms. The best policies to accomplish

such a goal are those which will encourage interdistrict competition. The following recommendations indicate the type of policies required:

1. All corporate charters granted by the Trust Territory Government should allow corporations to conduct corporate business in any district of the Territory. Such charters would allow outside competition to develop in the districts as businessmen move from one district to another. Also, the mobility of capital and other resources between districts would be increased. Such mobility would increase the resource potential for all districts which offer business opportunities.

2. All Trust Territory Government contracts should be let on a Territory-wide basis. No attempt should be made to show local preference in any district. Such a policy would allow the most efficient and capable Micronesian businessmen to compete on a Territory-wide basis and would expand the potential markets of growing firms.

3. Copra licenses should allow the licensed companies to trade for copra in all districts of the Territory. All trading vessels are now common carriers. Territory-wide copra licenses would permit buyers representing several companies to make the field trips to the outer islands. Even if no traders from one

district entered another district, the possibility that this could happen would create competitive pressures and tend to prevent exorbitantly high trade goods prices and to stimulate trading companies to offer better quantities and varieties of trade goods to the out-islanders.

Trading Company Specialization. It is recommended that the release of Government businesses to trading companies in the private sector be conditional on the abilities of the companies to provide competent management. The criterion must always be the ability of a company to conduct the business in the best interest of the general public. As time passes, more local firms will develop the necessary capabilities. In cases where local indigenous companies cannot provide adequate service, Micronesian businessmen from another district should be encouraged to serve the public needs that are not being met through local resources. For the next several years, and for the major services which require heavy capital investment and highly technical operations and management decisions, the public interest probably demands the kind of performance which only non-indigenous firms can provide.

Most new private investment opportunities in the Trust Territory have resulted from the growth of activities which the Trust Territory Government has traditionally conducted. As

incomes and population have increased, and as markets have developed, many of these activities have developed commercial potential. Examples of such activities range from providing hotel accommodations to distributing petroleum products. Some of the trading companies, particularly Truk Trading Company, Yap Cooperative Association, and MIECO at Majuro, have diversified to the point where they operate theatres, hotels, garages, and most of the other retail businesses in their respective districts. Many of the financial problems of some trading companies have resulted from management problems associated with such broad diversification.

While it is desirable for the Trust Territory Government to seek private operators for the several business activities which it has been conducting, and while it is equally desirable to attempt to place these businesses in the hands of Micronesians, care must be taken to protect the general public--not just the trading companies. If essential services are turned over to local indigenous companies which are not yet capable of providing the services, whole communities will suffer and economic development potentials will be retarded, perhaps seriously.

Services

The limited private services available in the Trust Territory are the result of several conditions. First, the high prestige and excellent working conditions associated with government employment attract the most able portion of the work force. Second, the dispersion of population results in a small labor force available for wage employment. Third, the small size of most communities, and the traditional orientation of the communities, has provided limited markets for services. Finally, the long-term experience of the Government as the provider of services has developed a way of life in which the development of private services can proceed only very slowly.

Individual Services. The Trust Territory Government should proceed as rapidly as possible to turn over the responsibility for providing services to the private sector. The Trust Territory Government continues to offer many personal services to the public. Repair services, such as appliance repair and, in some cases, private auto repair, are provided by many district public works departments.

Vocational education programs should be designed to assure that competent services can be offered by the private sector. Equally important, however, the policy of denying entry and business licenses to non-Micronesians who could perform such services on the grounds that some Micronesian may eventually be capable

of performing such service should be abolished, and direct efforts should be made to induce experienced service business operators and skilled servicemen to enter and work in the Trust Territory. Micronesian jobs can be created and skills can be taught by aliens who establish small service businesses.

Institutional Services. Given the base already established, private banking and insurance services should be improved. In the area of institutional services, increased participation by outside firms is indispensable. Micronesians should be absorbed into the new enterprises as rapidly as possible without impairing the efficiency of operations. The overall economic benefits provided by these service enterprises, and of the kinds of experience which their Micronesian employees will receive, will be of major importance in the future development of the Trust Territory.

As time passes, and as population and incomes increase, the demand for institutional services will also increase. As Micronesians become more skilled in offering such services, they will be able to establish new firms capable of successfully competing with firms owned by Americans and/or other outsiders.

EXPANSION POTENTIAL AND RESOURCE REQUIREMENTS

The projections and estimates contained in this section are largely based on the anticipated development of the economic sectors discussed in the other chapters of this report. As agriculture, commercial fisheries, tourism, transportation, and general government activities expand, the industries and activities discussed in this chapter will also expand.

Manufacturing

The review of possibilities for expanding manufacturing enterprises has indicated few promising prospects for large investments of capital during the next five years. The capital requirements to finance the fabrication for sale in the Territory of such products as boats, furniture, handicrafts and processed foods are not likely to be more than a few hundred thousand dollars. This is limited mainly by the size of the market and by the relatively high cost of the labor that would be used in fabricating imported raw materials or assembling imported components for local sale. The extraction of oil from copra, if in fact a detailed economic analysis shows it to be economically feasible, would necessitate capital investment of the order of $1 million. The

prospects for canning fish or tropical fruits for export are less promising and hence no capital investment is projected for the next five years.

Construction

The total volume of construction will include both the public and the private sectors. The Government will finance all of the former and a major part of the latter. The proportion of the total volume of construction that will be done by the private construction industry as distinguished from Government force account will be determined by the rate of progress in the capability of the private industry. The aggregate volume of investment in new construction described in other chapters is $60 to $90 million. This chapter adds $11 to $12.5 million for manufacturing, trade, services and the facilities of the construction industry itself. It is difficult, and for present purposes not essential, to split these totals into the part handled directly by the Government and the part handled by the private construction industry. It has been indicated elsewhere that the Government might finance $50 to $75 million in new construction.

An investment of $60 to $90 million in new construction would require 17,500 to 25,000 man-years of construction labor.

An average of 3,500 to 4,500 full-time construction jobs would be created for the five-year period. Between one-quarter and one-half of total expenditures would be for wages and salaries. At least half of the construction jobs can be performed by Micronesians if they are available.

Because almost all supplies, material and equipment will be imported, and because about 50 percent of the labor may be supplied by non-indigenous workers who will probably send large portions of their earnings out of the Territory, the multiplier effects of construction expenditures will be limited. Nevertheless, it is estimated that between $15 and $20 million, or from $3 to $4 million per year in new direct demand for goods and services of possible indigenous origin will be created by the construction industries. Hence, gross incomes of the suppliers of these goods and services will be increased by a similar sum in the first round of expenditures. Those benefiting will in turn make purchases and so on but with a high "leakage" at each stage as a result of expenditures on imported items.

Wholesale/Retail Trade

Because development will not occur simultaneously in all districts, and because some districts will be relatively slower

to develop than others, it is estimated that the volume of wholesale/retail trade may only triple in the Trust Territory as a whole during the next five years. In some districts, however, increases in the volume of trade may be twice as great as the Territory-wide average.

On a conservative estimate, it is projected that retail trade volume will approximate $30 million per year by 1972, as compared with an estimated figure of $10 million currently. Between 5,000 and 8,000 persons will be employed in trade; 75 percent of these jobs could be filled by local people. The other 25 percent of the jobs will require skills and experience which will need to be imported since they will not be available locally in the Trust Territory by 1972.

Because most wholesale/retail businesses currently operate from temporary buildings which were constructed many years ago, investment will be required to construct warehouses, stores and shops. This investment will range between $5 million and $10 million for the Territory as a whole. Construction of trade facilities can provide from 100 to 125 construction jobs for indigenous workers and an equal additional number for skilled workers who will need to be brought in from outside.

Services

Individual Services. The individual service industries can employ between 500 and 750 persons by 1972. Given adequate training programs and financial assistance, most of these service jobs could be performed by Micronesians. However, in order to make available adequate opportunities for the necessary on-the-job training and experience, it will be necessary to allow non-indigenous service firms to establish businesses and bring skilled and managerial people into the Territory. It is assumed that approximately 50 percent of the service jobs will be performed by non-indigenous workers.

Investment required by the expansion of the service industries is estimated to be between $500,000 and $1 million.

Institutional Services. Banks, insurance firms and other service organizations can provide employment for 100 to 150 indigenous persons; from 25 to 50 non-indigenous employees will be required.

In all probability the interests of the Trust Territory would be best served if financial service institutions were branch organizations of outside institutions which have access to large amounts of financial resources. For this reason, no estimates of financial resources required to establish service institutions in

the Trust Territory are presented here. Further attention is given in Part Four to meeting the financial resource needs for Trust Territory economic expansion.

CHAPTER EIGHT

TOURISM AND TRAVEL

In many parts of the world, tourism and travel have provided and are providing the basic money flows essential to the development of economic opportunities and the expansion of local incomes. The Trust Territory has many assets which may be utilized in building a viable tourism and travel industry. Not only does the development of a tourism and travel industry in the Trust Territory appear to be feasible and desirable in its own right, tourist industry development is highly desirable as a means to create an environment in which other kinds of economic development can more rapidly occur.

To state that a tourism and travel industry is feasible and desirable is not to say that the industry will automatically develop. Unless active programs are established to promote the industry, it will develop very slowly, if at all. At the present time, there is practically no tourist industry in the Trust Territory. Given the present institutional and economic limitations, the establishment of a significant tourist industry in the foreseeable future requires a comprehensive and well conceived plan for tourist development.

TRAVEL PATTERNS IN THE TRUST TERRITORY

While tourism, as generally defined, is so insignificant as to be immeasurable in the Trust Territory, travel by government employees, and other official and nonofficial travelers has created some existing demand for tourist-type services. This demand is the nucleus around which a tourist service industry can be developed.

Present travel within the Trust Territory is by means of either ship or airplane. Because of the significant difference between the activities and needs of the people who use one or the other of these transportation media, each of these two classes of travel deserves separate attention.

Ship Passenger Travel

Surface transportation in Trust Territory is provided by three logistic vessels which visit Guam, Japan and each of the district centers, and a number of smaller station vessels which operate out of the district centers to provide transportation between district centers and the outer islands. The great majority of passengers carried both on the logistic vessels and on the station vessels are Micronesians who travel from one

island to another within and between districts. It is estimated that some 6,000 Micronesians travel from one place to another within the Trust Territory by ship each year.

Most Micronesians travel as deck passengers and do not use cabin or dining accommodations on the vessels. When the less "westernized" Micronesians travel, they often take all of their possessions with them. Generally they rely on relatives to provide them with housing and food when they are away from home. Rarely do Micronesians demand tourist-type services or facilities.

Aside from government field trip personnel, and the few government employees who can only reach their duty stations by means of the surface vessels, very few non-Micronesians travel on Trust Territory vessels. While many non-Micronesians from the Trust Territory and Guam would probably be interested in utilizing surface vessel transportation to Japan, and some Japanese would probably be interested in visiting the Trust Territory by surface vessel, present approved ship accommodations limit the number of passengers entering and leaving foreign ports to 12 cabin passengers. International conventions prevent the transportation of deck passengers between foreign ports and Trust Territory.

For all practical purposes then, travelers who utilize surface transportation in the Trust Territory must be regarded as a unique "class" of travelers. They demand few or no tourist

type facilities, and it is extremely doubtful that such travelers will provide any base for the development of hotels, restaurants and other facilities which cater to transients.

Air Travel

Air travelers, because of their economic status and purpose for travel, can and do provide a demand for tourist-type facilities. The following subsections provide a breakdown of air trips and air travelers in the Trust Territory for fiscal year 1965. More recent data are not available.

Official Travelers. The administration of an area such as the Trust Territory demands great mobility on the part of administrators. During fiscal year 1965, 9282 official trips were made by government travelers (including dependents) via the Trust Territory air service. These trips amounted to slightly less than 40 percent of the total number of the air trips recorded.

Because the dependents of Trust Territory personnel are granted two free trips to any point served by the Trust Territory air service during a year of duty, and because they are regarded as official travelers (they travel on Trust Territory Government travel authorizations), at least a portion of official travel

must be considered as tourism. For the most part, however, dependent traffic flowed into Guam, rather than into other parts of the Trust Territory.

Nonofficial Travelers. During 1965, almost 60 percent of the total air trips in the Trust Territory were nonofficial--that is, these trips were taken by individuals who were not traveling in an official capacity for the Trust Territory Government. These nonofficial travelers may be classified as follows:

Missionaries and Students. Because of preferential air rates which the Trust Territory has extended to missionaries and students, and because of the relatively large number of students who attend school in Guam, Hawaii, and other points outside the Trust Territory, approximately 3,000 air trips or 15 percent of the total number of air trips were made by students and missionaries during fiscal year 1965.

Commercial Travelers. Commercial travel in Trust Territory amounted to about 2,500 air trips in fiscal year 1965, or about 10 percent of the total number of air trips. Most commercial travelers represented Micronesian trading companies. A few travelers represented firms outside Trust Territory.

Other Travelers. Travelers other than those listed above took about 9,500 trips, or about 40 percent of the total number of air trips in fiscal year 1965. It is important to note, however, that almost 8,000 of these trips were made on the short flights between points in the Marianas: Guam to Rota, Rota to Saipan, Saipan to Rota, Saipan to Guam, and Rota to Guam. Almost all of these travelers were Micronesians.

Many Micronesians from Saipan and Rota work in Guam, and some people from Rota work in Saipan. As a result, there is a considerable flow of traffic between these points as people return home for short-term visits. Relatively nominal air fares undoubtedly contributed to this flow. The one-way fare from Saipan to Rota was $6.00, and from Saipan to Guam, $12.00.

In addition to Micronesians, a very small number of tourists from Guam and Kwajalein are included in the "other travelers" figures. Teachers, military personnel, and a few other American residents of Guam and Kwajalein visited Trust Territory points in fiscal year 1965. While the exact number of such visitors is unknown, it was necessarily small because of the limited air service and visitor accommodations in the Trust Territory. Most of the visitors from Guam probably visited Saipan.

Even though a large portion of air travel in the Trust Territory is of an official or semi-official nature, most air travelers require transient accommodations. In the past, most accommodations were provided by the Trust Territory Government. Almost all of the hotels and restaurants owned by the Trust Territory Government are now under lease to private (Micronesian) operators.

SURVEY OF ACCOMMODATIONS FOR TRAVELERS IN TRUST TERRITORY

Hotel and restaurant facilities in the various districts of the Trust Territory were originally designed as minimal accommodations for a relatively small number of official travelers. Newer facilities, built within recent years, reflect the earlier patterns of design, construction and services, and offer little more than the most basic necessities. Generally speaking, the standards of maintenance and cleanliness are quite low and quality of service is poor.

The following subsections present a brief review of the accommodations which are available in each district of the Trust Territory. No attempt is made to include all transient rooms or eating facilities. The purpose of this survey is to indicate

the general capability of each district to care for travelers. It must be recognized, of course, that all of the ratings are subjective.

Marianas District

For the most part, the accommodations found in the Marianas District are much superior to those found in other districts. Because Saipan has a relatively large American population and is the location of the Trust Territory Government Headquarters, a considerable number of official travelers visit the Island each year. Aside from the official guest house maintained by the Trust Territory Government, Saipan has one relatively new hotel, consisting of 16 rooms, a small motel and a handful of "sleeping rooms." The hotel is owned by the Trust Territory Government and is operated by a Micronesian leaseholder. The motel is privately owned and operated.

Even though the hotel and motel are both relatively new, most travelers would rate them rather low. Rooms are poorly furnished and standards of cleanliness are poor. Normal hotel services are generally not provided.

In regard to restaurants on Saipan, a snack bar operated by a Micronesian who was trained at the East-West Center at Hawaii is located in the Trust Territory Headquarters housing area.

Service and food are generally good and may be favorably compared to service and food of similar-type establishments in the United States. Other eating facilities on Saipan include the Community Club, also located in the Government housing area, which serves dinner meals twice a week. In Garapan, a small community on Saipan, a retired Navy Chief operates a small but clean restaurant which has a limited menu. All other eating facilities on Saipan are owned and operated by Saipanese. The best of these is a restaurant operated in connection with the hotel. The hotel restaurant has very limited patronization by the American community. The standards of cleanliness and the bill of fare are regarded as substantially below American standards.

At the present time, preparations are underway to construct a new 50-room hotel which will have dining facilities and a swimming pool. The hotel will be built in a prime beach location. It is to be constructed and operated by an American entrepreneur on Guam.

Other facilities in the Marianas include a hotel and restaurant for the occasional travelers who visit Tinian, and a similar establishment on Rota. Both of these establishments probably meet minimum standards for areas which enjoy little transient traffic.

Yap District

The construction of a new 10-room hotel with sleeping accommodations for 20 persons was recently completed on Yap. This hotel is a two-story building which also has eating facilities. The design of the building is utilitarian and the materials which have been incorporated into its construction are of such quality that they do little to enhance the beauty or durability of the building. If the hotel is well managed and maintained, however, it should provide accommodations which would be considered by most Americans as meeting minimum standards.

With the exception of hotel restaurant facilities, Yap has no commercial restaurants which approach minimum tourist standards of cleanliness and food quality.

Palau District

The only hotel in Palau, the Royal Palauan, is situated in a Butler-type building which was erected about ten years ago. The hotel has about fifteen rooms (without private baths) and a restaurant facility. In general, the building has been poorly maintained and the quality of service is poor. While the hotel restaurant serves what is, perhaps, the best fare in the Trust Territory, the standards of cleanliness leave much to be desired.

On the whole, it may be possible to rate the Royal Palauan as meeting minimum standards, but it would be difficult to rank it much higher.

Truk District

The Truk Hotel is similar to the Royal Palauan Hotel. It is a Butler-type building with ten rooms. Private baths are available in some rooms. The building has not been maintained as well as the Royal Palauan Hotel, and the standards of cleanliness are lower. The sanitary and cleanliness standards of the hotel restaurant are extremely low. Even frequent Trust Territory travelers, who have generally become accustomed to minimum standards of facilities and services, rank the hotel and restaurant facilities at Truk quite low. The hotel provides the only sleeping and eating facilities for travelers in Truk.

Ponape District

Ponape has a new ten-room hotel which is similar to the one recently constructed on Yap. On the whole, it is reasonably clean and well-managed. Restaurant facilities in the hotel are adequate. The food is generally good, but the menu offers limited variety. Ponape Hotel and restaurant facilities provide adequate accommodations for the adventurous traveler.

Marshalls District

Tourist facilities and accommodations in Majuro are very inadequate. The long low frame buildings which were previously operated by the Trust Territory Government as a hotel have been leased to private management. The building is old and poorly maintained. There are no locks on the doors, and the management warns the guest not to leave anything of value in his room.

Excellent tourist rooms will be available in the new MIECO building which is nearing completion. This very large concrete building will house the MIECO offices, the MIECO restaurant and the MIECO bar (both of which are already open), about 20 hotel rooms, and, hopefully, a branch bank, all on the second floor. The first floor will provide space for the MIECO retail store, wholesale outlet, a warehouse, and a barber shop. If the plans are carried out as presently visualized, the MIECO hotel rooms will be much finer than any now existing anywhere in the Trust Territory.

Restaurant facilities in Majuro consist of the dining room of the old hotel, which is located separately from the hotel itself in an old frame building, and the new MIECO restaurant. The old hotel restaurant operates family style and serves adequate food. The new MIECO restaurant is excellently furnished and serves good food.

POTENTIAL TRAVEL AND TOURISM IN THE TRUST TERRITORY

It is obvious that as local incomes increase, and cultural values change to give Micronesians a broader perspective, the amount of domestic travel and the domestic demand for tourist-type accommodations will increase. It is also obvious, however, that a population of only 90,000 persons scattered over such a large area as the Trust Territory will not provide the stimulus for the development of a significant internal tourist industry. Indigenous demands for tourist services will be slight in the foreseeable future.

Official and Commercial Travel

The relatively high level of official travel associated with the administration of the Trust Territory, and the almost certain increases in official travel as government programs are formed and expanded will undoubtedly stimulate a significant internal official demand for tourist-type services. A particularly stimulating factor will be the new Peace Corps program which is now being implemented. In satisfying this administrative demand, not only will jobs and money income be created, but also the base for serving foreign tourists will be broadened.

It is probably safe to assume that internal travel in the Trust Territory, both official and commercial, will increase at least in direct proportion to increases in Trust Territory Government expenditures. That is, if we assume that Trust Territory expenditures will double within the next two years, we can probably also assume that the amount of internal travel will at least double.

Unfortunately there are no data to give an accurate picture of the number of transients who now visit the various districts. As a rough estimate, however, a total of 15,000 transient days are spent annually in the various districts. Projecting to 1972, we may well expect internal travel to increase to a level where 30,000 transient days annually will be spent in the various districts by internal travelers who would demand transit accommodations. 1/

1/ More precise projections could be made by checking air service manifests, hotel registrations, and the like if these records were available and accurate. Present administrative procedures for processing these records do not place emphasis on extracting such data from them. It would, therefore, be extremely difficult and costly to refine the estimates. Further, because of the relatively small scale of travel, refinement would probably result in insignificant changes in the estimates. It should be noted, however, that changes in record processing procedures which would make precise travel data available would be extremely helpful in future planning and could be easily implemented.

The assumption that internal travel is directly related to government expenditures, and will increase at least proportionately with increases in the Trust Territory Government budget, is based on the fact that government activities dominate the economy. It is inconceivable that a drastic change in the relative importance of the public sector could occur within the next few years. It is almost certain that future public expenditure increases will be mostly directed toward expanding programs and capital improvements which will demand a higher level of official travel to the various districts.

Tourist Travel

In terms of tourist attractions, there is no doubt that each of the Trust Territory districts has unique beauty and local color. Aside from the prohibitive capital requirements to develop tourist facilities in each of the districts, however, it must be recognized that inconvenient locations and great distances from the main streams of international travel almost assure that most districts will not become large tourist centers any time in the near future. On the other hand, the rates of expansion in transportation, in other technology, in world population, and in incomes and travel trends could result in tourist industries eventually being developed in all of the Trust Territory districts. At the moment, the most likely districts for development appear to be the Marianas District, the Palau District and, perhaps, the Yap District. The following subsections present a summary of the potential for tourist development in each district.

Marianas District. Saipan, in the Marianas District, is the location of the headquarters of the Trust Territory Government. To Americans and Japanese, Saipan and many of the nearby islands have special significance as the locale of some of the bloodiest and most dramatic battles of World War II. The large number of Americans and Japanese who died on Saipan make the island especially

important to the people of these now friendly nations. Many Japanese and Americans would like to visit the islands to commemorate the battles which occurred there, and some would like to revisit the scenes of their wartime experiences.

Ancestor homage is an important part of contemporary Japanese culture. Pilgrimages to places where Japanese have fought and died are common. An example of how this Japanese trait has contributed to the development of a tourist industry is found in Okinawa, where a large tourist industry has been built on the base of such visitations. The large numbers of Japanese who have traveled to Okinawa to visit gravesites and to establish shrines have made it commercially feasible to build large hotels and appurtenant facilities. Today, Okinawa enjoys a major tourist industry and no longer must rely on the attraction of warborn memories. In 1965, more than 100,000 Japanese (some two-thirds of all Japanese who traveled abroad) visited Okinawa.[2/]

In terms of natural beauty, Saipan is one of the most attractive of the Trust Territory islands. It is a high island with mountain peaks. While much of the coast is rugged, Saipan has fairly large lagoon area with sandy beaches protected from the sea by an offshore coral reef.

2/ Source: Japan Travel Bureau

Although most World War II relics have long since been removed by scrap collectors, or have deteriorated to the point of becoming unsightly piles of junk, both Saipan and the nearby island of Tinian have fortifications, historic airfields and other artifacts of war which would be of interest to tourists. The people and the general way of life in the northern Marianas are less distinctive to westerners than the people and customs of other districts. The Marianas Islanders (Chamorros) are by far the most sophisticated of all the Micronesians. As a result of prolonged periods of contact with Spaniards, Germans, Japanese and Americans, most of the original culture has been lost. Nevertheless, the Chamorro people would probably make excellent hosts for Japanese and American tourists.

In addition to natural attractions, Saipan has the advantage of being the most favorably located major island relative to the flow of international travel in the Western Pacific. It is located 120 miles from Guam and only 1300 miles from Tokyo.

Yap District. The Yap District is one of the least developed areas of the Trust Territory. The District possesses a number of characteristics which may be regarded as prime tourist attractions. First, the Yap Islands, while not spectacular, are

beautiful. Second, the Yapese people, while very dignified and rather aloof, are pleasant and generally excellent hosts. Third, and most important, the Yap Islands exhibit almost all of the elements which combine in the minds of most people to form a picture of a typical south seas island, and the name of Yap is familiar to many people because of the famous Yapese stone money. Finally, located between Guam and Palau, the Yap Islands are reasonably accessible to tourists.

Because the Yapese people are extremely conservative, traditional dress and culture have to a large degree been preserved in the District. Colorful grass skirts are worn by the women and brightly colored loin cloths are still worn by many men. Yapese villages possess a movie set quality. Traditional construction, reflecting great skill and pride of workmanship, combines with a cultural penchant for neatness and produces a degree of historical perfection to please the aesthetic sensibilities of almost all visitors to Yap.

Traditional cultural features, such as huge pieces of stone money, traditional ceremonies and an active adherence to "old" ways make Yap District one of the most interesting and unique areas in the Pacific. Yap has the only district center in the Trust Territory where traditional customs, social values and living patterns predominate.

Because of the relatively small land area of the Yap Islands, and the relatively poor physical resources for tourism, it would probably be a mistake to plan for any great influx of tourists. On the other hand, there is no doubt that a sufficient number of tourists could be accommodated to produce a significant local economic impact.

Palau District. While the Palau District has a less favorable climate and geographic location than the Marianas District (Palau is only 5° north of the equator), at certain times of the year the District is most pleasant. Also, while the District is more than 2,000 miles from Japan, and approximately 700 miles from Guam, its central location relative to the Philippines, Indonesia and Australia suggest exciting possible expansions of transportation facilities which would make Palau accessible and convenient for international travelers. The major attractions for tourists who might visit Palau in the near future, however, would probably not be climate or convenient location.

From 1917 to 1945, Koror Island in the Palau District was the administrative center of the Japanese Mandated Islands. Because of Palau's central location, and because of Japanese ambitions in regard to a Pacific empire, a substantial city was constructed on the island of Koror. While the city of Koror

was almost completely destroyed during World War II, the remains of the Japanese occupation provide the area with a unique Oriental flavor. Stone lanterns, shrines and other evidences of Japanese habitation abound. Many of these momentos of a different time could be the basis around which a charming and picturesque community could be reconstructed.

In addition to artifacts, the Palau District is characterized by unique natural phenomena. Scattered throughout the Palau lagoon, but particularly concentrated around Koror, are numerous small islands. While some of these islands have excellent beaches, their most interesting aspect is their appearance. The islands are almost solid rock, peculiarly covered by thick vegetation. Further, they have been subjected to a unique type of erosion which gives the visual impression of giant green mushrooms rising out of the deep blue lagoon. The over-all impression is one of scenic grandeur.

For reasons which need not be discussed here, the Palau District appears to have some potential for commercial development. The development of commercial fishing, boatbuilding and related activities would undoubtedly attract commercial travelers as well as casual tourists.

Although many of the people in the city of Koror are very sophisticated, on the large island of Babelthuap, near Koror, there are many native villages where life goes on in the traditional manner. Without question, the people and the local color of Palau would be of interest to many tourists.

Truk District. Truk is located approximately 500 miles southeast of Guam. The District is characterized by a relatively large population: Because the District has the world's largest lagoon, it was used by the Japanese as an anchorage for their Pacific fleet. The island of Dublon, in Truk lagoon, was once a large Japanese military installation with fine houses, roads and docks. Today, the island of Dublon is primarily jungle and population is concentrated on the island of Moen, a short distance away.

Because the United States occupation forces chose to establish their facilities on the then almost deserted island of Moen, buildings and facilities in the District Center all date to the end of World War II. Moen, which is now the District Headquarters, is a community of temporary buildings. A new dock was built in the early 1960's. For the most part, however, buildings, roads and other facilities are old and in poor repair.

In order for tourism to develop in the Truk District, it will be necessary to spend relatively large sums of money to construct a community which can meet the minimum needs of casual travelers. For instance, the present water supply for the Truk District Center is inadequate to meet local needs.

The people of Truk are friendly and interesting, and the District would undoubtedly appeal to some travelers. It does not seem likely, however, that the necessary facilities can be constructed, nor that adequate transportation will be available to develop Truk as a tourist center in the near future. As in all cases where the development of an industry does not appear feasible at the present time, the tourist development program should be sufficiently flexible to allow exploitation of opportunities in Truk District if and when the necessary conditions to support a tourist industry are met.

Ponape District. In many respects Ponape is the most remote of the Trust Territory districts. It is located approximately halfway between Truk and the eastern boundary of the Trust Territory. Because Ponape does not have airport facilities, all air travel to and from Ponape is by SA-16 amphibious aircraft. Amphibious aircraft have limited passenger accommodations. It is anticipated, however, that an airport will be constructed at Ponape within the next two years.

Within the Ponape District, virtually all travel is by means of boat. There are no roads on the large Ponape Island. Furthermore, because the population of the large island is quite scattered, there are limited public facilities in Kolonia, the District Center and the only sizeable community on Ponape Island. The accommodations which would be required by tourists at Ponape would demand considerable planning and large expenditures.

While the District certainly has its share of pleasant people and natural attractions, such as rich green tropical growth, prehistoric ruins, scattered islands, and sheltered lagoons, climatic conditions of the District during some parts of the year would serve as a deterrent to the development of tourism. Rainfall averages very close to 200 inches each year at some places in Ponape.

As is the case with the Truk District, it is not anticipated that any large tourist development will occur in the Ponape District in the near future. With the completion of the airfield and improvements in both air and sea transportation as recommended in this report, new opportunities for tourist expansion in Ponape may be expected eventually to arise.

Marshalls District. The Marshalls District is the only district in Trust Territory which is comprised entirely of low

islands. These low palm-covered strip islands have beautiful beaches and a unique appearance. While the climate during some parts of the year might be regarded as a little too hot and humid to be conducive to the development of a tourist industry, the major impediment to tourist industry development in the Marshalls is the remoteness of the Islands.

At the present time, a large United States military installation is located on Kwajalein Island in the Marshalls District. Because of the isolated location of this installation, some military people do visit other islands in the Marshalls group for recreational purposes. It may be possible to develop a small tourist industry on the basis of the several thousand Americans located at the installation at Kwajalein. In regard to other tourists, the great cost and inconvenience of reaching the Marshall Islands would appear to preclude the development of any sizeable tourist industry until major changes occur in transportation routes and points of entry into the Trust Territory.

Major Tourist Markets

At the present time, the only contact between points in Trust Territory and external points is provided by (1) the Trust Territory Government which provides air transportation from Trust Territory points to Guam, and (2) two logistic vessels which call

at ports in the Territory, in Guam and in Japan on a monthly schedule. One logistic vessel which does not visit Japan calls at Guam on a biweekly schedule. There is no international transient traffic flow through the Trust Territory.

Guam. In contemplating expanded transportation services in the Trust Territory, expansions are most likely to involve increased service along present routes. However, it is not unlikely that some service, especially airline service, to new points of entry can and will be established. But in all probability, no matter what changes are made in the transportation system, Guam will continue to be the major point of entry into the Trust Territory. 3/

Potential tourists who would enter the Trust Territory from Guam fall into two categories. First, Guam has a resident population of approximately 75,000 persons, including United States military personnel. Given adequate accommodations, recreation facilities and low air fares, it could reasonably be anticipated that some permanent residents of Guam would visit points in the Trust Territory. Because a large portion of the population of

---

3/ A program for the expansion of transportation services in the Trust Territory is presented in another chapter of this report.

Guam consists of relatively low income military personnel and indigenous residents, the number of Guam residents who will visit points in Trust Territory as tourists is limited. Based on the most casual observations, it is estimated that the annual number of Guam residents who might tour in the Trust Territory would not exceed 10,000. Most of these tourists would restrict their visits to the nearby island of Saipan.

Second, in addition to the permanent residents of Guam, it is anticipated that visitors to Guam will also be potential tourists to the Trust Territory. At the present time, Guamanian planners are suggesting that the Island may have 75,000 visitors each year by 1970. These visitors are expected to be conventional tourists (as opposed to visitors who come to the Island only for business reasons). At least two 250-room modern resort hotels are now being planned to meet the needs of these expected tourists.

Given the propensity of tourists to stay in the larger population areas and to remain in the immediate vicinity of ports of entry, it does not seem reasonable to suppose the majority of tourists visiting Guam will also visit the Trust Territory. For purposes of estimation, therefore, an assumption that 25 percent of the tourists who visit Guam may continue on to Trust Territory is generous, but perhaps not unattainable. An overflow of Guam tourists of this size could provide the Trust Territory with

15,000 to 20,000 tourists each year.

The number of tourists entering the Trust Territory from Guam, including Guam residents and casual travelers, will probably not exceed 30,000 per year any time in the near future. It must be kept in mind that this estimated volume of tourists is based on assumptions about the availability and adequacy of transportation and accommodations, and on the accuracy of the Guam tourist projections. The estimate probably represents the maximum potential for tourist expansion based on tourism originating from Guam. 4/

Japan. Many Japanese tourists want to visit the Trust Territory, particularly Saipan. Interviews have been conducted with several of the leading Japanese tourist and travel agencies to assess the potential tourism in the Trust Territory which might be expected to originate from Japan. In particular, Japan Travel Service, Japan Travel Bureau and Fujita Travel Enterprises, the three largest tourist agencies in Japan, were asked to assess

---

4/ Martin Prey, Director of the United States Travel Service in Tokyo, is one of a number of people who are extremely optimistic about Guam's tourist potential. Assuming an over-all reduction in Pacific area air fares, and a United States policy to expand Guam's free port privileges, Mr. Prey visualizes a volume of tourist traffic through Guam which could provide up to 50,000 American tourists annually for the Trust Territory--particularly the northern Mariana Islands.

potential Japanese interest in visiting the Trust Territory. All agreed that Japanese interest in Pacific travel is real and substantial. Japanese tours are already being established to visit Tahiti, Fiji and other South Pacific islands. The close proximity of the Trust Territory to Japan (Saipan is to Tokyo, approximately, as Miami is to New York), the modest requirements in time and money for the Japanese traveler, plus the south sea atmosphere, the warm winter climate and the many other attractions of the Trust Territory, combine to make the Trust Territory, particularly the Marianas, potentially a prime destination for vacationing businessmen and others from Japan.

At the present time, according to travel agent estimates, there are approximately 40,000 Japanese with the desire and the means to visit the Trust Territory for the sole purpose of commemorating the Japanese war dead. All told, the concensus among the contacted travel agents is that 25,000 to 30,000 Japanese tourists would want to visit the Trust Territory each year by 1970 if Trust Territory tourism was promoted in Japan. These agents emphasized that the development of a tourist industry based on Japanese demand would be contingent on inexpensive direct transportation between Japan and the Trust Territory. Given the distances between Trust Territory districts, these

agents generally agreed that as an initial step the development of Saipan, and possibly Palau, because it is known as the former Japanese administrative center, would probably be the most realistic approach to establishing a tourist industry based on Japanese demand. Other districts would probably have little immediate potential because of the greater distances and higher travel costs.

Because there has been no Japanese tourism in Trust Territory in the past, it must be recognized that the impressions of the Japanese travel specialists are based on rough market surveys and an intuitive feel for Japanese tastes and desires. Nevertheless, the expressed willingness of the Japanese travel agents to enter into direct promotional activities would indicate their own faith in their forecasts. Thus, it appears reasonable to project a potential inflow of 30,000 Japanese tourists per year within the next five years.

IMPEDIMENTS TO THE DEVELOPMENT OF A TOURISM AND TRAVEL INDUSTRY

Regardless of the size of the number of potential tourists who may want to visit Trust Territory, unless action is taken to remove basic barriers to tourist industry development, the full

potential of the industry may never be realized. Because any one of the barriers could effectively prevent the realization of tourism and travel development, all of the barriers must be removed simultaneously if significant development is to be achieved. The main barriers to tourist industry development are: (1) restriction on entry, (2) transportation limitations, and (3) inadequate or non-existent accommodations, recreational facilities and services.

Entry Restrictions

In the recent past, all travelers who wished to enter the Trust Territory were required to obtain security clearances from the United States Navy and entry permits from the Trust Territory Government. Even today, all travelers must obtain entry permits, and travelers who are not United States citizens must still obtain clearances from the Navy Department. If large numbers of tourists are to enter the Trust Territory, restrictions on foreign (non-Micronesian) travelers must be relaxed and/or a simple and speedy system will have to be devised for processing and approving entry requests.

Transportation Limitations

Because of the limited capability of the Trust Territory air service and the infrequent schedules of Trust Territory surface vessels, casual travel has been almost impossible in

Trust Territory. The requirements for official (priority) travel simply have not permitted the nonofficial traveler any assurance that he would be able to obtain a plane seat or a ship cabin. The nonofficial traveler has stood a risk of being stranded in a remote district center for weeks at a time.

Accommodations and Recreational Facility Limitations

Throughout the Trust Territory, travel accommodations are limited, and in many places, primitive. Trust Territory hotels are reminiscent of the truckers' "bunk houses" and the "auto courts" found along American highways thirty years ago. Restaurants are few in number and are generally of poor quality. For some travelers these facilities will suffice; for most, they will not. If very much tourist industry development is to occur in the Trust Territory, hotel accommodations and restaurant facilities must be improved.

There are few recreation facilities in the Trust Territory. For instance, there are no motion picture or other theaters of commercial quality. Automobiles are scarce, and generally no boating services are available to the casual traveler. Lack of ground and water transportation is particularly inhibiting because most scenic areas in the Trust Territory are some distance

from the administrative centers. Almost everywhere, areas and facilities for swimming and other water sports need to be developed. Beach sites are often characterized by shallow water, are unpleasant because of animal life and in some instances are hazardous in their undeveloped state.

Given all of the difficulties which potential tourists may encounter, it is unreasonable to assume that tourism will develop as a result of "good publicity" given by the occasional traveler. A tourism and travel industry will only develop if the obstacles to tourism and travel are removed and explicit actions are taken to assure the casual traveler of a pleasant and rewarding visit.

PROBLEMS OF TOURIST INDUSTRY SCALE OF OPERATION

Because of the almost complete lack of hotel and restaurant facilities, infrastructure, and transportation to support a tourism and travel industry, serious questions arise as to the minimum scale of facilities which are required to initiate tourist travel.

Two problems arise in regard to the minimum hotel and restaurant facilities which are required. First, although virtually all hotels and restaurants in the Trust Territory are

currently operated by Micronesians (even government-owned facilities generally have Micronesian managers), the ability of most Micronesian operators to provide satisfactory service to tourists is limited. While small motels and restaurants are sometimes operated by untrained and unskilled people in rural parts of the United States and other developed nations, it must be remembered that such persons have at least had an opportunity to see motels and restaurants which operate under professional management. Unfortunately, such an opportunity is denied to most Micronesians. They do not know what standards to apply or how to apply the standards. Furthermore, efficient management is frequently made difficult by the inability of Micronesian managers to speak English and to maintain adequate records.

For hotels and restaurants to be maintained in accordance with standards which meet minimum tourist requirements, foreign management and, in some cases, foreign labor (waiters, maids, bellboys, etc.) will be required. In order to justify the importation of relatively expensive foreign labor, it will be necessary for hotels and restaurants to be relatively large and to have a relatively high volume of tourist business.

A second problem associated with minimum facilities require arises from the basic economics of hotel and restaurant operations.

It is generally felt by knowledgeable hotel operators that in order to economically offer a full range of hotel services, a hotel must have a minimum of about 60 rooms. Given the limited appurtenant tourist facilities in most districts, hotels in the Trust Territory must be complete tourist service centers.

In addition to the problems related to the actual operation of the hotels and restaurants, there are certain external problems of scale which must be solved. The basic infrastructure is inadequate in most districts. The improvements which will be required to accommodate even a handful of tourists can, at very little extra cost, be designed to accommodate fairly large numbers of tourists. In both Yap and Truk, for instance, at certain times of the year the water supply is so critical that nonofficial travelers are not permitted to enter either district. In order to assure a continuous and safe supply of water, reservoirs are required. Once new storage capacity is added, however, water supplies should be sufficient to allow hundreds of people to visit these districts.

In some instances, the discontinuities of transportation are just as pronounced as the discontinuities in providing accommodations and infrastructure. For example, no Trust Territory ship now meets the safety and other standards which

would permit it to carry more than 12 passengers into a foreign port. The cost of increasing the number of allowable passengers to 15 or 20 would be almost as great as the cost required to increase the number to 100 or more.

By the same token, the high fixed costs associated with the maintenance of a regular and dependable air transportation system make the marginal cost of carrying additional air travelers relatively low. At the present time, for instance, Trust Territory aircraft are operated only a relatively small number of hours during each week. While government accounting procedures tend to obscure depreciation and other fixed costs, commercial cost accounting of the operation would reveal that seat mile costs would decrease significantly with increases in traffic and aircraft utilization.

In summary, the numbers of tourists who must be attracted and cared for during the initial phase of development will probably be greater than would be required in a less remote, more highly developed area. Intermediate size, full facility hotels, rather than small hotels, and substantial infrastructure and transportation improvements will be required to adequately prepare for any tourism development. To make these sizeable facilities economically feasible, sizeable numbers of tourists must be attracted. Previous sections of this Chapter have indicated that the potential demand

is great enough to make this initial expansion possible. The following section of this Chapter presents the recommendations on how to proceed to exploit this potential.

RECOMMENDATIONS AND SUGGESTED PROGRAMS

As indicated elsewhere in this Chapter, all of the major deterrents to tourist development must be attacked simultaneously. Any one of the barriers to tourism in the Trust Territory is sufficient to deny the possibility of industry development.

Entry Restrictions

Two major hurdles must be overcome if access to the Trust Territory is to be sufficiently free to attract substantial numbers of tourists. First, the time and delay in obtaining entry permits must be reduced. Second, procedures must be established whereby Navy clearances for non-United States citizens can be quickly and conveniently obtained by prospective tourists or be done away with entirely.

Entry Permits. All travelers with United States passports should be admitted to the Territory on their passports. A United States citizen without a passport should be issued an entry permit

by a representative of the High Commissioner at ports of entry on presentation of proof of United States citizenship.

An alternative to the procedure of allowing admission on the basis of a United States passport might be the wide dissemination of entry permit forms in the United States. Forms could be made available at United States post offices and other distribution centers. A representative of the High Commissioner, in the Office of Territories, could be delegated the authority to issue permits.

In regard to travelers who are not United States citizens, the easiest procedure would be to recognize a valid United States visa as sufficient to permit entry into the Trust Territory. Also, authority could be delegated to United States Embassies abroad to allow them to issue temporary entry permits (30 days or less) to tourists. The authority to grant long-term or permanent permits could remain with the High Commissioner without impeding tourist industry development.

While the exact procedures for allowing entry of United States and foreign citizens might take any number of forms, it is obvious that the present procedures can be improved to allow freer access to the Trust Territory. It is recommended that immediate steps be taken to liberalize and ease the entry regulations, and to streamline entry procedures.

Military Security Clearances. It is recommended that the question of the security clearance requirement for Trust Territory entry be presented to knowledgeable experts for re-evaluation in terms of the current and projected security requirements of the United States. It is not obvious why military security requirements for the Trust Territory should be more restrictive than the security requirements for Guam or Okinawa.

In regard to military clearance procedures for travelers, other than United States citizens, who may wish to visit the Trust Territory, it is recommended that such persons be directly admitted by the High Commissioner for short periods (30 days or less) unless explicit objections are raised by the clearance agency. No positive action in regard to granting clearances should be required of the clearance agency. For long-term or permanent entry, a formal clearance could be issued.

Transportation

While transportation in the Trust Territory is analyzed in another section of this report, it is absolutely essential to make clear the relationship between tourist development and transportation facilities. Both surface and air transportation between

major tourist markets and Trust Territory destinations must be improved before tourism can become an important industry.

Because transportation services must be expanded before traffic can increase, a certain amount of risk cannot be avoided. This risk will probably have to be underwritten by the Trust Territory Government, regardless of whether ships and planes are operated by private parties or by the Trust Territory Government. In the former case, subsidies or guarantees will probably be required to induce expanded service. In the latter case, increased operating costs will be the penalty for expanded service. The question should not be whether the Government should assume the burden of risk, but rather whether the potential returns make the risk worthwhile when viewed in the light of the over-all objectives of the Trust Territory Government.

Accommodations, Facilities, and Services

New hotels and other facilities must be constructed, and existing hotels and facilities must be upgraded before any significant number of tourists can visit the Trust Territory. Because the amount of current travel in Trust Territory, and the numbers of transients passing through the districts at the present time, does provide a level of demand which justifies the construction

and operation of "tourist quality" hotels and restaurants to serve as a base for tourist development, the following recommendations are submitted.

Government Ownership of Facilities. It will probably be necessary for the Government to provide basic tourist accommodations in several of the districts. The desirability of leaving hotel and restaurant development to the private sector is apparent, and in those cases where private investors and operators are available and willing to assume responsibility for providing such facilities, the Trust Territory Government should give them as much assistance as possible.

Many areas of Trust Territory do not have sufficient immediate potential to attract private capital for the development of a tourist industry--even with active training and lending programs for Micronesians, and an active program for soliciting external (non-Micronesian) managerial and financial resources. Initial development will have to be the direct responsibility of the Trust Territory Government. At such time as it becomes feasible, the facilities can and should be released to the private sector.

Management and Supervision. A qualified general manager-supervisor should be recruited to assume responsibility for the operations of all government-owned hotels and restaurants. The general manager-supervisor should have managerial responsibility for facilities directly operated by the Government and should inspect and enforce the implementation of high standards of operation required by lease arrangements made with private operators of government-owned hotels and restaurants. An important part of the task to be performed by the general manager-supervisor would be to provide technical assistance and guidance to private operators of government-owned facilities and to operators of privately-owned facilities.

High and rigid standards of sanitation and service should be required of all hotel and restaurant operators as a condition of obtaining and maintaining business licenses. Strict enforcement of standards is essential.

Solicitation of External Resources

It is recommended that vigorous efforts be made to solicit foreign capital and foreign skilled labor in order to acquire the basic resources needed to establish a tourist industry. While it is also recommended that the Trust Territory Government encourage

local investment in tourism by making direct and guaranteed loans, and by establishing training programs, it should be recognized that without capital, management and labor from outside, initial development of the industry will be seriously impeded.

Basic facilities for tourists can be provided by the Trust Territory Government and, to some extent, by Micronesians, but the development of the full tourism potential of the Trust Territory will depend on the availability and utilization of external resources. Trust Territory does not possess the indigenous capital, knowledge, skills or labor required for a tourist industry. Even assuming that capital could be supplied by the Trust Territory Government, and that certain of the managerial and other required skills could be passed along to Micronesians by means of well conceived training programs, it is doubtful that the small population of Trust Territory could amass sufficient skilled and other labor to develop a tourist industry to a size which would make the industry economically feasible.

Community Renewal and Land Use and Infrastructure Planning

While the over-all infrastructure requirements of the districts go well beyond the needs of a tourist industry, any community renewal programs which may be implemented by the

Government should reflect recognition of the fact that tourism may well be a major industry of Trust Territory. Programs for district center renewal are needed in all districts. With the exception of schools, most public buildings are temporary structures. Road mileage is inadequate to meet present needs, and most roads are in poor repair. Many basic services, particularly water and power, will need to be expanded. The tourist industry needs should be considered in planning these infrastructure improvements.

Community Planning. Planned public buildings and public services should take explicit account of prospective tourist needs in each district. All public structures should reflect aesthetic as well as utilitarian considerations. Well integrated and attractive communities will be essential to large-scale tourist development.

Recreational and Historical Site Development. Immediate steps should be taken by the Trust Territory Government to retain, and protect from misuse, recreational and historical sites which may eventually serve as attractions for tourists. Land distribution policies must incorporate concepts of "best land use." Many fine beaches and historical sites have already been dissipated, at

great cost to Micronesians of the future, as the result of short-sighted and unplanned homestead and lease programs.

On some islands, particularly in the Mariana and Palau Districts, recreational and historical site development should keep pace with the construction of new hotels and transportation improvements. In some instances there is already an economic justification for clearing and improving sites to accommodate interested visitors. Funds for planning and beginning such developments should be provided as soon as possible.

Tourist Development Program

The tourism and travel industry has the potential to become a major industry in the Trust Territory. To capture this potential, a tourist development division should be established within the Department of Resources and Development. A Director of Tourism should be recruited to promote major tourist markets, to solicit external capital and labor for employment in a Trust Territory tourism and travel industry, and to formulate and coordinate various tourism and travel industry projects throughout Trust Territory.

RESOURCE REQUIREMENTS FOR TOURIST INDUSTRY DEVELOPMENT

Because the Trust Territory has no tourist industry base, projections of the resource requirements for the development of the industry must be made on a large number of assumptions which cannot be tested against historical growth patterns. For this reason, the projections must allow for a wide range of growth possibilities.

From the best data available, it is estimated that between 30,000 and 40,000 tourists (15,000 to 20,000 from or through Guam; 15,000 to 20,000 from Japan) could be attracted to the Trust Territory annually by 1972. It is assumed that the average tourist will spend from 5 to 7 days in the Territory, providing a total of 150,000 to 280,000 tourist days per year. Further, it is assumed that the average tourist will spend from $20 to $25 per day. If these assumptions are correct, and if the necessary programs are undertaken to attract and serve these tourists, direct tourist expenditures in the Trust Territory will amount to between $3 and $7 million annually by 1972.

In addition to tourists, government and other internal travelers may be expected to spend up to 30,000 transit days annually in the various districts of the Trust Territory by 1972. This is approximately double the number of transit days estimated to be

currently spent in the districts by such travelers. It is assumed that these internal travelers will spend at least $20 per day, or approximately $600,000 annually.

The estimated total direct expenditures by tourists and other travelers, of between $3 and $7 million annually by 1972, does not appear unreasonable in view of the indicators presented previously in this Chapter and other places in this report. Further given the multiplier effects resulting from the flow of tourism and travel expenditures throughout the Trust Territory economy, total gross expenditures generated by the industry could range from $5 to $10 million.

Hotels and Restaurants

As indicated in discussions elsewhere in this Chapter, present hotels and restaurants are wholly inadequate to serve the needs of tourist industry development. New hotels will be required to replace the present facilities if the potential of the industry is to be realized, or even allowed to experience any development during the five-year planning period.

All the available evidence indicates that the Marianas and Palau Districts have the greatest immediate potential for tourist expansion. Therefore, the highest priorities should be given to the construction of tourist facilities at Saipan and Koror. First

class hotels of appropriate size should be constructed at these locations in order to attract tourists to the Trust Territory. The next step would be to add facilities on other islands in order to induce visitors to travel to points other than the Marianas and Palau and thus extend their stay in the Trust Territory. Construction of facilities on Yap, Truk, Ponape and the Marshalls should be phased over several years as the tourist business develops. Such phasing would have the further advantage of spreading out the capital expenditures and the labor demands for construction. These secondary facilities should meet internationally acceptable standards, but can be more modest than those of the Marianas and Palau. Improved facilities are needed on these other islands for business and government travelers. This need can be met without building on the scale that will subsequently be needed as the tourist business develops.

It is proposed that during the next five-year period 250 to 350 hotel rooms be built in the Marianas, 150 to 250 in Palau and 200 to 250 in the other islands. At $15,000 to $18,000 per room the capital investment would be approximately $10 to $15 million. Approximately 80 percent of this investment will be for construction.

A travel and tourist industry of the size projected could provide from 700 to 1000 jobs in hotels and restaurants alone. Approximately 25 percent of these jobs will require skills which will not be available in Trust Territory. The remaining 75 percent of the jobs can be performed with unskilled indigenous labor if it is available.

In addition to the jobs created by hotel operations, from 500 to 700 full-time construction jobs will be created by hotel construction for the period, 1967-1972. It is estimated that as many as 50 percent of these jobs may be performed by indigenous workers.

Satellite Facilities

During the early years of development of the industry, it is likely that between 60 and 80 percent of the tourist and travel dollars spent in the Trust Territory will be spent in the hotels, and in the restaurant and entertainment facilities provided directly by the hotels. The remaining 20 to 40 percent will be spent in other parts of the economy. Retail trade and services should be direct recipients of between $1 million and $3 million of tourist and travel expenditures annually by 1972. The respending effect of the dollars brought in and left by tourists will further increase trade expenditures as hotel employees spend their earnings, and as

hotels buy goods and services from local businesses and people.

The total impact of this respending, or "multiplier" effect on local economic activity and incomes is estimated to be between $2 million and $3 million. This is in addition to the estimated direct expenditure by travelers of between $3 million and $7 million. The sum of these figures gives a direct operating impact of between $5 million and $10 million which, of course, excludes the impact of the original and continuing investment spending by the industry itself and the construction, services, supply, and respending effects associated therewith.

The economic effect of the investment expenditures required to provide the needed facilities will be sizeable, but limited by the fact that most of the construction costs will have to be paid to outsiders rather than spent in the local economies. Except for the first year or so of rapid industry expansion, the investment spending effect will be only a very small fraction of the size of the continuing and expanding local economic effect of the operating expenditures. The local economic impact of the direct and respending effects of the investment expenditures is expected to average between $1.5 million and $3 million per year duing the first five-year period.

The construction, trade and services expenditures discussed here are reflected in the projections of construction, trade and services presented in the previous Chapter.

Summary Requirements for Tourist and Travel Industry Development

Tables I and II present summaries of the capital and labor requirements for the tourist and travel industry development over the five-year planning period, from 1967 to 1972. These figures are meant to indicate general magnitudes rather than precise calculations of requirements or cost estimates.

TABLE I

Estimated Net Investment Requirements for Tourism Development
(Includes both Private Investment and Government Investment)

	Millions of Dollars (Five-Year Totals) 1967-1972
Hotel, Restaurant, and Entertainment Facilities	$10 - $15
Specific Infrastructure Extensions, Expansions and Additions	$ 1 - $ 3
Most of the investment requirements for transportation, utilities, and other facilities needed to support the tourist industry expansions are presented in other chapters in Parts II and III of this report. The figure presented here provides a rough estimate of the costs of specific infrastructure additions which will likely be required to support and establish the feasibility of specific hotel and other tourist industry development projects.	
TOTALS	$11 - $18

TABLE II

Estimated Labor Requirements for Tourism Development
(Number of People Required, Including Managerial, Technical, Supervisory, Skilled, Semi-Skilled, and Unskilled)

(Annual Average for Five-Year Period)
(Numbers of Jobs Available)
1967-1972

	Indigenous Labor	Non-Indigenous Labor
Construction of Hotels and Appurtenant Facilities	250 - 300	250 - 300
Operations of Hotels and Appurtenant Facilities	500 - 700	200 - 250
TOTALS	750 -1000	450 - 550

CHAPTER NINE

SEA AND AIR TRANSPORTATION

It is difficult to overstate the importance of an efficient and reliable transportation system in an area such as the Trust Territory. In terms of efficient administration, it is essential to provide the means by which government officials and cargo may move freely and rapidly from one district to another and between the Territory and other areas. In terms of social development, the parochialism of the island societies may only be overcome by constant improvement in the mobility of the members of the societies. In terms of economic development, the demands of commerce for improved transportation are insatiable. Given the limited resource base of the Trust Territory, the efficient exploitation of economic resources can only be accomplished by insuring an adequate flow of commodities and persons into, out of, and within the Territory.

While transportation in the Trust Territory has constantly improved over the years of United States administration, many problems still remain to be solved. This chapter includes

descriptions and analyses of the present Trust Territory sea and air transportation systems, and of the most serious current transportation problems. Also included are recommendations for policies and actions which will solve some of the problems, and which will permit the transportation systems to develop and expand to meet the minimum transportation requirements for administrative efficiency and meaningful economic development.

SEA TRANSPORTATION

Two separate and distinct water transportation systems exist in the Trust Territory. Logistic vessels provide inter-district cargo and passenger services and connect the Trust Territory with foreign ports. Station or "field trip" vessels provide intradistrict service and connect outer islands with the district centers.

Logistic Service

At the present time, three long distance supply vessels provide service between the six districts of Trust Territory and from and to Guam and Japan. Cargo from Japan is delivered directly to all district centers except Yap and Palau by the two vessels which call at ports in Japan: the M/V PACIFIC ISLANDER

(G/T 4,128), and the M/V GUNNERS KNOT (G/T 3,812). Cargo from Japan destined for Yap and Palau is transshipped through Saipan and is delivered by the M/V PALAU ISLANDER (G/T 692), an elongated AKL-type vessel. All Trust Territory cargo from the United States is transshipped through Guam or Japan and is delivered to the various districts by the three logistic vessels.

Currently, the vessels which visit Japan operate on a 57-day roundtrip schedule. Each of the districts served by these vessels is visited by both "inbound" and "outbound" ships approximately every 30 days. The M/V PALAU ISLANDER maintains a 14-day roundtrip schedule between Saipan, Guam, Yap and Palau.

Although the logistic vessels are owned by the Trust Territory Government, they are operated by Micronesian Line, a private corporation chartered by the Trust Territory Government and a wholly owned subsidiary of United Tanker Corporation. Under the terms of the operating contract, Micronesian Line is responsible for maintaining the vessels and providing scheduled service to specified ports within the Territory. The Trust Territory Government receives twenty-five percent of gross shipping revenues in return for providing Micronesian Line with vessels.

Passenger accommodations on the logistic vessels are limited. Two vessels, M/V GUNNERS KNOT and M/V PALAU ISLANDER, have accommodations for 12 cabin passengers each. The third vessel, M/V PACIFIC ISLANDER, can carry 39 cabin passengers. All of the vessels carry deck passengers when they operate in Trust Territory waters. Because of international conventions and U.S. Coast Guard safety regulations, none of the vessels may enter the Port of Guam or other foreign ports with more than 12 cabin class passengers. Although a special ruling allows Trust Territory students to be carried into Guam as deck passengers, no other deck passengers may be carried into Guam or into any other foreign port.

Station Service

While logistic vessels provide cargo and passenger services between the districts and foreign ports, station vessels, working from district centers, provide service between the district centers and the outer islands of the districts. The vessels are relatively small and perform the dual function of carrying copra and trade goods, and providing the means

whereby administrators, medical technicians, teachers and other officials may visit remote communities.

Marianas District. Station vessel service within the Marianas District is provided by the Saipan Shipping Company, a private Micronesian corporation. Weekly service is provided between Saipan and Guam. Monthly visits are made to all of the inhabited islands of the northern Marianas for copra pick-up and sales of trade goods.

Until recently, Saipan Shipping Company owned and operated a wooden hull vessel, the M/V FOUR WINDS (G/T 530). The company currently leases, at $1,000 per month, and operates a Trust Territory vessel, the M/V RAN ANNIM (G/T 540). The RAN ANNIM is an AKL-type vessel formerly used for station vessel services in the Truk District. The M/V FOUR WINDS was recently sold to the Truk Transportation Company.

Both the M/V FOUR WINDS and the M/V RAN ANNIM can accommodate 12 cabin passengers. As is the case with all station vessels, however, the majority of the passengers travel as deck passengers.

Yap District. In the Yap District, station vessel services are provided by the M/V YAP ISLANDER (G/T 220), a new

vessel, delivered in 1965. The M/V YAP ISLANDER has accommodations for 8 cabin class passengers.

At the present time, the M/V YAP ISLANDER is operated by the Yap Cooperative Association, the major import/export organization in the Yap District, in accordance with a contract negotiated with the Trust Territory Government. The Trust Territory Government provides the vessel and pays an operating subsidy of $114 per day to the Cooperative. In return, Yap Cooperative Association operates and maintains the vessel except for drydocking, and remits 50 percent of the gross shipping revenues to the Trust Territory Government. Scheduled monthly visits are made to the outer islands of the District.

Palau District. Because the Palau District has a relatively small number of inhabited outer islands, no station vessel operates regularly in the District. The M/V YAP ISLANDER is chartered by the District Administrator when field trips are scheduled.

Truk District. The M/V TRUK ISLANDER, a sister vessel of the M/V YAP ISLANDER, is operated by the Truk Transportation Company under a contract with Trust Territory Government identical to the operating contract held by Yap Cooperative Association.

The Truk Transportation Company (TRANSCO) is a private Micronesian corporation.

In addition to operating the M/V TRUK ISLANDER, TRANSCO operates a small vessel owned by the Trust Territory Government, the M/V FEIOCH (G/T 20), which only visits islands within the Truk Lagoon. The Trust Territory Government provides an operating subsidy of $32 per day for the operation of this vessel and receives 10 percent of the gross revenues.

As a result of an inter-line agreement concluded between Pacific Far East Lines and TRANSCO, the Company will soon initiate regular scheduled service between Truk and Guam. Cargo moving from U.S. ports to Truk will be transshipped at Guam and carried from Guam to Truk by TRANSCO. TRANSCO has acquired the M/V FOUR WINDS (G/T 530) in order to handle this service. It is also anticipated that TRANSCO will soon initiate regular scheduled service between Truk and Rabaul, New Guinea.

Ponape District. The Trust Territory vessel, M/V KASELEHLIA (G/T 250), is operated by the Ponape Federation of Cooperatives and serves the entire Ponape District. An operating subsidy of $220 per day is provided and the Trust Territory Government receives 50 percent of the gross shipping revenues. The M/V KASELEHLIA has cabin accommodations for 12 passengers.

A second station vessel, the M/V TUNGARU (G/T 220), is owned and operated without subsidies by the Ponape Shipping Company,

a Micronesian corporation. Because of mechanical difficulties, the vessel has not provided any shipping services in the District within the past year.

Marshalls District. Because of the large number of inhabited islands, the quantities of copra produced and the great distances between islands, four station vessels serve the Marshalls District. A Micronesian trading company, KITCO, located on Kwajalein Atoll, operates the Trust Territory vessel M/V MILITOBI (G/T 483). This vessel, like the M/V KASELEHLIA, can accommodate 12 cabin passengers. Under terms of the operating contract, KITCO receives an operating subsidy of $200 per day and the Trust Territory Government receives 50 percent of gross shipping revenues.

Two other vessels, M/V MIECO QUEEN (G/T 500) and M/V RALIK RATAK (G/T 200), are owned and operated by MIECO, a Micronesian trading company located at Majuro. Each of the vessels has cabin accommodations for four passengers. Only the M/V MIECO QUEEN receives a subsidy.

A fourth vessel in the Marshalls, the M/V NAURU (G/T 120), is owned and operated by a small Majuro trading company which does not hold a copra trading license. This vessel has no cabin accommodations for passengers.

Other District Craft. In addition to the logistic and station vessels, the public works department in each district maintains and operates an assortment of small speed boats and

work vessels. All districts operate obsolete World War II LCM's (Landing Craft, Materials), and three districts operate old LCU's (Landing Craft, Utility). Speed boats are utilized by district administrative personnel, teachers and other officials to visit islands and communities near the district center which are not accessible by road. Some small, privately owned boats also are in each district.

As time passes, the numbers of privately owned small power craft will increase. Paddling and sailing canoes, the traditional vehicles of water transportation in the Territory, are already disappearing in some districts. The impact of small power boat transportation in the districts is comparable to the impact of the automobile in rural areas of the United States; markets become more accessible, and the sophistication of rural populations is increased as a result of easier and more frequent contact with the larger communities.

Evaluation of Water Transportation Services

At the present time, the whole Trust Territory is in a state of transition resulting from a gradual change in the concepts of administration and development potential. In the past, under military administration and early civil administration, the main responsibility of the transportation system was

considered to be the logistic support of the Trust Territory Government's programs and activities. Commercial cargo and non-official passengers were insignificant. Because the Government's programs and activities were limited, the total requirement for transportation was limited.

In recent years it has become obvious that the whole concept of what constitutes an adequate transportation system for the Trust Territory must be re-evaluated. The present water transportation system, initiated in 1965, reflects the efforts of the Trust Territory Government to meet the new transportation requirements. If these efforts have not been entirely successful, it is largely due to the fact that transportation requirements have not always been easy to determine.

Trust Territory transportation data are available only in the most abbreviated form. Further, virtually all of the existing data are of questionable accuracy. Adequate records have rarely been maintained, and most published data represent guesses which are based on previous guesses. Errors have been perpetuated and compounded over a long period of time.

Cargo movements shown in the annual reports to the United Nations, the only source of such data, are far from

accurate. Indeed, given the number of vessels carrying cargo in the Trust Territory, their size, and the maximum number of voyages possible in any given year, it would have been virtually impossible to carry the quantities of cargo reported in some years. On the basis of interviews conducted with officials who have been involved with actual cargo handling, it is estimated that actual cargo carried into the Trust Territory from foreign ports and cargo carried within the Trust Territory between district centers may have been as little as one-half of the cargo reported in some of the recent annual reports. This estimate is partially supported by the records of Micronesian Line, the present commercial operator of the logistic vessels.

At the end of August, 1966, Micronesian Line prepared an analysis of cargo carried during the Company's first year of operations, September 1, 1965, to August 30, 1966. During this period, the vessels operated on more frequent and regular schedules than during previous years, and personnel carried over from previous years of operation testify to greater cargo volume than ever before. Nevertheless, the analysis indicates a 50 percent discrepancy between actual cargo moving from Guam to Trust Territory ports during 1966 and cargo officially

reported for 1965. Further, the analysis does not indicate any compensating changes in cargo originating from other foreign ports.

Table I shows Trust Territory cargo reported to have been carried on logistic vessels between fiscal years 1960 and 1965. The figures shown for fiscal year 1966 are rounded figures derived from the Micronesian Line records.

While many of the figures presented in Table I, page 13, do not appear reasonable, the percentage growth indicated for the years between 1960 and 1965 could have easily occurred. The large increases in the Trust Territory budget over these years and the associated increase in Trust Territory construction undoubtedly had a significant impact on Trust Territory shipping. Total annual cargo movements into Trust Territory from foreign ports may well have increased by more than 100 percent, as indicated by the data, between 1960 and 1965.

Particularly interesting in Table I are figures reflecting cargo movements from Japan to the Trust Territory. Japanese cargo appears to have increased more than threefold. The general agreement between reported figures and Micronesian Line records would appear to indicate that this estimation of growth may not

Table I

General Cargo Reported to have been carried on Trust Territory Logistic Vessels*

FY 1960 - 1965
(Revenue Tons)

Itinerary	1960	1961	1962	1963	1964	1965	1966[1]
Guam to Trust Territory Ports[2]	31,710	32,708	36,322	46,756	56,490	51,933	27,000
Trust Territory Ports to Guam[3]	7,743	2,717	6,322	13,784	3,209	8,710	--
Trust Territory Ports to Trust Territory Ports	8,797	9,730	7,527	10,096	10,191	34,051	9,000
Japan to Trust Territory Ports	--	--	--	5,596	11,414	18,273	17,000
Japan to Guam	--	--	--	--	--	--	2,000
Trust Territory Ports to Japan	--	--	--	12,988	18,121	17,402	16,000

Source: 13th-17th Annual Report to the United Nations and Micronesian Line

* Does not include petroleum, oil and lubricants.

1/ Estimates made on basis of Micronesian Line records.

2/ Includes cargo moving from Japan to Trust Territory prior to 1963. Includes cargo moving from Japan to Guam prior to 1966. Also includes cargo carried from Guam to Saipan by Saipan Shipping Company (4,000 tons estimated for 1966).

3/ Includes Trust Territory cargo moving to Japan prior to 1963. Also includes cargo carried from Saipan to Guam by Saipan Shipping Company (500 tons estimated for 1966).

be exaggerated. It could be, then, that 35 to 50 percent of all external cargo flowing into the Trust Territory is currently originating in Japan.

Because of the paucity of accurate shipping data, it is hazardous to attempt to estimate the volume of commercial shipping prior to 1966. Nevertheless, Trust Territory Government transportation personnel generally agree that at least 60 percent of the cargo moving into Trust Territory in 1960 was government cargo. In view of the nature of the economy of the Trust Territory at that time, this estimate appears to be low.

As a part of the overall analysis of the logistic service, Micronesian Line found that government cargo accounted for only 35 percent of total cargo moving from Guam to Trust Territory ports in 1966. The remaining 65 percent of the cargo was commercial. Even more impressive, Micronesian Line reports that 80 percent of the cargo moving from Japan to the Trust Territory is non-government commercial cargo. It appears that government cargo may account for as little as 30 percent of all in-bound cargo at the present time.

Evaluation of Logistic Service. There is little question that commercial operation is desirable for the basic logistic

service in the Trust Territory. Prior to the assumption of operational responsibility for the logistic vessels by Micronesian Line, District Administrators and other Trust Territory officials often utilized the large logistics ships for minor administrative purposes. A vessel would be delayed or diverted from its schedule for the convenience of the Government on the assumption that commercial priorities were always lower than government priorities.

Under the terms of the current contract with Micronesian Line, the company has been given full authority to operate the logistic vessels as common carriers. Because of profit incentives, all decisions are made on the basis of economic considerations. Delays and deviations from schedules occur only if the company feels that such delays and deviations are economically worthwhile. As a result of vessel management motivated by attempts to maximize profits, the Trust Territory probably enjoys the most efficient logistic service it has ever known. Ships generally arrive and depart on time. Merchants may plan inventories with a reasonable sense of certainty that a ship will not be diverted and by-pass their district.

While the unwillingness of the logistic vessel operators to compromise revenues and profits in order to provide strictly

administrative services has proved to be a source of frustration to some administrators, and has possibly been detrimental to important government projects in a few cases, there can be little doubt that introduction of a regular and orderly logistic service has made a major contribution to economic and social progress in the Territory. Any short-run disadvantages of commercially oriented (as opposed to administratively oriented) logistic service are proving to be more than offset by the long-run advantages of such service.

In acknowledging the very important changes in logistic services which have been made in recent years, care must be taken not to imply that the current service is wholly adequate for development purposes. Indeed, while most of the changes have certainly been steps in the right direction, current services must be greatly improved if the logistic service is to produce the impact which is necessary for development. Further, unless some attempt is made to halt the fractionalization of the logistic service caused by the introduction of logistic service by small district shipping companies, such as Saipan Shipping Company and Truk Transportation Company, the erosion of the revenues of the major logistics carrier, Micronesian Line, could result in the disintigration of the present reasonably efficient logistic system.

The major areas in which improvements in current logistic vessel service could be significant are indicated by profits which could be generated by the operation of the three logistic vessels. On a projected gross revenue of approximately $2 million, the Trust Territory Government will receive about $500,000 (25 percent of gross revenues) and the operator, Micronesian Line, will realize net profits in excess of $100,000 in calendar year 1966. Total net profits, allowing a reasonable depreciation on equipment, may well be as high as 30 percent of gross revenues. Although the logistic vessels were acquired without cost to the Trust Territory Government, the total replacement cost of the three vessels probably would not exceed $500,000. It is quite possible that net profits of the logistic service are as high as 100 percent annually on the value of invested capital. These extremely high profits can only be attributed to the exploitation of the monopolistic conditions which characterize the service.

While the 1966 profits of the logistic service were the result of monopoly logistic service, they should not be interpreted as a justification for introducing numerous small carriers to the service for the purpose of stimulating competition. That a monopoly position for the major logistic carrier is desirable is probably beyond question. The limited size of markets, and the limited volumes of cargo moving into Trust Territory, almost assure that two or more

competing carriers within the Territory would be unable to generate sufficient profits to support the basic services required. The major problem, then, is not that the major logistics carrier may be a monopoly, but rather that the carrier may be encouraged to take full advantage of its position to maximize monopoly profits. It matters little that the great bulk of these profits may be paid to the Trust Territory Government. So long as freight rates are established on the basis of providing maximum possible monopoly profits, services essential to the development of the Territory will be severely curtailed. If freight rates were reduced to provide a more modest rate of profit, the quantitites of cargo moving through Trust Territory would increase. In order to carry the additional cargo it would be necessary to expand the logistic services offered. Greater numbers of better designed and faster ships and greater amounts of cargo moving at lower costs could only have beneficial effects on the island economies.

By reducing freight rates and increasing the regularity and dependability of transportation services, undoubtedly many currently infeasible development projects could be undertaken in the Trust Territory. More important perhaps, increased

exposure to material goods and increased frequency of contact with the outside world would help produce the psychological changes among the island peoples which are a prerequisite to internally generated economic growth. Economic development is just as much a product of attitudes and outlook as it is a product of basic material resources.

Evaluation of Station Service. As in the case of the logistic service, the Trust Territory Government has moved to emphasize the commercial aspects of the field service provided by station vessels. Operations of the vessels have been turned over to local commercial companies. Even though these companies have profit incentives, and provisions have been established to remit portions of gross revenues to the Government as lease payments for vessels, operating subsidies are still required. These subsidies currently are paid (conveniently) from the profits realized on the logistic service.

If the commercial potential of station vessel operations was great enough to warrant temporary assistance until such time as the station vessels could operate on a purely commercial

basis, the extra burden placed on the logistic service of supporting field services could possibly be justified. Unlike the logistic service, however, the economics of providing station vessel service to the sparsely populated outlying islands are such that the station service will probably never be self-supporting. The major function of the station vessels will be to provide support for government educational, medical, agricultural, political development, and other programs and services for the out-islanders.

The major cargo of station vessels is copra. At the present time, approximately 13,000 tons are carried at a "postage stamp" rate of $12.50 per ton from any point in a district to the district center, generating only $130,000 in gross annual revenues. Under the circumstances, attempts of the Trust Territory Government to apply commercial principles to the operation of the station vessels have not been very successful.

To illustrate the problems of providing field service, the Marshalls District, the greatest copra producing district in Trust Territory, produces only 6,000 to 8,000 tons of copra each year. Station vessels in the Marshalls deliver trade goods to and pick up copra from the outer islands. Total revenues of these vessels amount to approximately one-third of the operating

costs. Sufficient commercial revenues to support the cost of the transportation service might be earned if only the few closest and most populous atolls in the Marshalls were served. But the marginal costs of serving the distant and less populous atolls is probably greater than the total income received from their copra production. It may well be that if agricultural extension costs and true transportation costs were computed, the total cost of producing copra on all the outer islands would exceed the total income received from the sale of copra.

Fortunately for the copra industry, however, the administrative obligations of the Trust Territory Government are such that field trip visits by the station vessels would be required regardless of the quantities of copra produced. Medical and other services can only be supplied to the outer islands by means of surface transportation. It is only by assigning the cost of subsidizing the station vessels to these administrative services that copra producing activity on many of the outer islands becomes economically feasible.

The arrangement whereby the Trust Territory Government uses high logistics freight rates and monopoly profits of the logistic service to offset the costs of administrative services provided by station vessels may be regarded as a special tax on

commercial and government cargo moving into, out of, and between district centers of the Trust Territory. This type of tax prevents the expansion of service which is needed to support economic development. Furthermore, it is a tax which does not discriminate between imports which are vital to building the economy and those which are luxuries. Finally, it is a regressive tax, the burden of which is placed mainly on receivers of low income who purchase the imported foods, beverages, and other commodities.

Most station vessel services can only be economically justified in terms of the essential administrative functions they perform. Therefore, the cost of these services should be charged against the administrative programs and functions on the outer islands--not against the ultimate consumers of imported goods. Freight rates on the station vessels should be set according to the marginal cost principle of pricing, and revenues received should be applied to partially offset the cost of providing support for administrative programs and services for the outer islands.

Evaluation of Surface Passenger Service. The most neglected aspect of the water transportation system in the Trust Territory is passenger service. As mentioned above, none

of the logistics vessels may carry more than 12 cabin passengers into ports outside the Trust Territory. Furthermore, government field service personnel usually occupy all of the station vessels' limited cabin accommodations. Nonofficial travelers seldom find it possible to obtain cabin space. With the exception of one vessel. M/V PACIFIC ISLANDER, none of the vessels has accommodations for more than 12 cabin passengers.

The great majority of intra-territory passengers travel as deck passengers. They provide their own food and sleep in tents on top of the cargo hatches. Not only does this situation deny the possibility of comfortable surface travel within the Trust Territory, it severely limits the opportunity for egress from and entry into the Territory. The resulting immobility of people threatens to become an increasingly serious impediment to overall economic development.

Basically, there are two reasons for such limited passenger accommodations. First, most vessels operating in the Trust Territory were not designed for the purposes for which they are currently being used. These vessels were generally designed to provide wartime cargo service and were never intended to be comfortable or efficient conveyers of people. The vessels

have been made available to operate in the Trust Territory only because they have been declared surplus, or obsolete, for other service.

Second, administrators have not yet fully recognized and adjusted their plans to take into account the considerable changes which have occurred within the past four or five years in the conditions and attitudes of many of the people in the Trust Territory. At one time, Micronesians did not travel a great deal. When they did travel, they had little money to spend for other than deck passage. But today many Micronesians would travel by cabin if the accommodations were available. The increase in water transportation passenger travel for the years 1960 to 1965 is shown in Table II.

The number of cabin passengers on Trust Territory vessels increased from 1,909 in 1960 to 2,251 in 1965, or approximately 18 percent. Available cabins have generally been fully utilized by high priority official travelers. The substantial increase in deck passengers, from 4,743 to 6,351, or approximately 34 percent, can largely be interpreted as an increase in travel resulting from the increase in Micronesian incomes which has occurred as government expenditures have

Table II

Cabin and Deck Passengers Carried on Trust Territory Vessels

FY 1960 - 1965

Itinerary	1960		1961		1962		1963		1964		1965	
	Cabin	Deck	Cabin	Deck	Cabin	Deck	Cabin	Deck	Cabin	Deck	Cabin	Deck
Guam to Trust Territory Ports*	116	191#	174	167#	245	448#	354	360#	173	57#	249	63#
Trust Territory Ports to Guam+	131	258#	175	234#	414	426#	183	419#	121	101#	233	133#
TT Ports to TT Ports	362	795	203	687	134	473	258	578	423	793	568	1,188
Japan to Trust Territory Ports	--	--	--	--	--	--	8	--	12	--	97	--
Trust Territory Ports to Japan	--	--	--	--	--	--	20	--	27	--	43	--
Palau Field Trips	70	204	18	25	68	136	40	99	29	93	53	60
Yap Field Trips	279	517	141	322	132	340	170	562	199	451	137	827
Truk Field Trips	345	1,171	368	1,035	356	1,447	259	597	295	1,098	253	1,457
Ponape Field Trips	327	967	191	910	219	1,099	300	1,559	173	626	257	1,220
Marshalls Field Trips	279	640	280	772	368	1,185	422	1,209	431	2,065	361	1,403
Marianas Field Trips	N/A	N/A	N/A	N/A	N/A	N/A	48	72	3	21	N/A	N/A
Total	1,909	4,743	1,550	4,152	1,936	5,554	2,062	5,455	1,886	5,305	2,251	6,351

* Includes passengers from Japan prior to 1963.
\# Includes passengers to Japan prior to 1963.
\+ Students.

increased. It is almost certain that more cabin accommodations would have been utilized if they had been available.

If, as this report suggests, tourism is to be one of the most important industries in the Territory, an increase in both quantity and quality of passenger accommodations will be needed on all vessels. In particular, accommodations on logistic vessels, connecting Trust Territory with foreign ports, must be expanded and improved. The ideal solution would be to acquire new vessels designed to meet the specific passenger/cargo needs of the Trust Territory.

Standards of Performance. It is significant that all seamen on Trust Territory-registered vessels are Micronesians. Not only have Micronesians shown a disposition to accept seagoing jobs, but considering the informal training which they have received, they perform with a remarkable degree of competence. Micronesians are gradually replacing foreign (Filipino) officers on the vessels.

Most unfortunate is the fact that most Micronesians have received their training under officers who have demonstrated little concern for their responsibilities other than to move the vessels from one place to another. Most of the American officers, who were on the vessels during an earlier period, and

the present Filipino officers have failed to instill a sense of obligation in maintaining vessels and providing sanitary quarters for passengers. For the most part, American officers were selected on the basis of their willingness to accept sub-standard wages rather than for their abilities to train Micronesians. Many of the Filipinos, on the other hand, have still to learn themselves that good maintenance of equipment and tight operating standards and procedures are essential parts of an efficient shipping operation.

As mentioned earlier in this report, economic development is as much dependent on mental attitudes as on material resources. The Trust Territory vessels are the only contact which many island communities have with the outside world. The standards of competence which they see practiced on the vessels become the standards they attribute to the more complex societies which development will demand them to emulate. For this reason, among others, it is essential that officers, crews, and the vessels themselves, be regarded as the formal representatives of the Trust Territory Government and of the larger, more sophisticated outside world.

While high maintenance standards may be justified on the basis of economical vessel operation, and high sanitary

standards on vessels may be regarded as good public health practice, it is also important that the realization of a prospective tourist industry in the Trust Territory will largely depend on high quality transport service. Standards must be set on the vessels which will not only establish a reasonable level of comfort for passengers, but which will also provide Micronesians with an example of the standards which are essential if the Trust Territory is to develop according to the patterns of the modern world.

AIR TRANSPORTATION

Given the vast expanses of the Trust Territory, a dependable air transport system is absolutely essential. While most air passengers in the past were official travelers, the situation is rapidly changing. Today, only slightly more than 30 percent of the passengers traveling on Trust Territory aircraft are government employees.

Air service in the Trust Territory is provided by two DC-4 aircraft and two SA-16 amphibious aircraft. These aircraft are owned by the Trust Territory Government and operated by Pan American Airways. Under the terms of the operating contract,

Pan American furnishes crews and maintenance. Aircraft utilization, routes and schedules are the responsibility of the Trust Territory Government. The contractor receives payment on the basis of miles flown. A minimum mileage guarantee is included in the contract.

Current Air Service

At the present time, all districts of the Trust Territory except Ponape are served by the DC-4 aircraft. Because Ponape does not have a landing strip, SA-16 aircraft, capable of water landings and take-offs, must be used to serve the District. The load capacity for SA-16-type aircraft is so limited that rarely is it possible to transport more than ten passengers and their baggage.

Basically, the Trust Territory air service system is composed of three routes, all of which terminate at Guam. The routes are as follows:

North: (R/T) Guam/Rota/Saipan

Southwest: (R/T) Guam/Yap/Koror (Palau)

Southeast: (R/T) Guam/Truk/Ponape/Kwajalein/Majuro

Beginning September 1, 1966, new air service schedules were introduced to provide more frequent and/or convenient service

to all of the district center islands. On the northern route, service between Saipan and Guam has been expanded from three to six DC-4 flights each week. Service to Saipan is now provided every day except Sunday. The flight from Saipan to Guam serves Rota on Monday and the flight from Guam to Saipan stops at Rota on Wednesday.

While the number of flights from Guam to points in the Eastern Caroline and Marshall Islands were not increased, a DC-4 flight has been substituted for the bi-weekly SA-16 flight. An SA-16 amphibian has been permanently stationed at Truk and provides service between Truk, Ponape and Kwajalein. The DC-4 connects Guam, Truk, Kwajalein and Majuro. The net effect of these changes is a 100 percent increase in the number of seat miles flown each week on the southeastern route. There is also a significant increase in cargo capacity on southeastern route flights. Plans have already been made to further increase eastern route service as soon as such an increase appears to be warranted.

Service along the southwestern route, which connects Guam, Yap and Palau, has been increased from one to two flights each week. A DC-4 departs from Guam for Yap and Palau on

Thursday. After overnighting at Palau, the flight returns to Guam, via Yap, on Friday. A second DC-4 flight provides round-trip service between Guam, Yap, and Palau on Sunday.

As this description of the air service schedule indicates, the ability to provide service on the southeastern route is impeded by the lack of a landing strip at Ponape. Not only is the schedule complex and costly in terms of passenger inconvenience, but the high seat mile cost of the SA-16 operation makes the service expensive for the Trust Territory Government. For these reasons, plans are underway to construct a coral runway on Takatik Island, a short distance from Kolonia, the district center of Ponape. Construction costs are estimated at $1,200,000. The airfield is expected to be in service within two years.

In fiscal year 1965, the only year for which reasonably complete data have been collected and presented in usable form, the Trust Territory air service carried 24,270 passengers. Passengers carried on each route are shown in Table III.

TABLE III

Air Passengers in the Trust Territory, by Passenger Class and Route

Fiscal Year 1965

Air Service Route	Official Passengers	Revenue Passengers	Students and Missionaries	Total
North	4,728	8,194	1,368	14,291
Southwest	1,452	1,008	864	3,324
Southeast	3,102	2,531	1,022	6,655
Total	9,282	11,733	3,254	24,270

Source: Derived from figures supplied by the Trust Territory Department of Transportation.

Prior to May, 1965, no airfield facilities were located at Koror (Palau). Because the nearest airfield which could be utilized by DC-4 aircraft was on Angaur (a five-hour boat trip from Koror), service on the southwestern route was provided by SA-16 amphibians during most of fiscal year 1965.

It is difficult to analyze the composition of traffic along routes served by SA-16-type aircraft. Government officials travel as priority passengers; given the limited passenger capacity of the amphibians, commercial passengers are often

denied air transportation and there is no way to determine how many commercial passengers would have traveled if more seats had been available.

During fiscal year 1965, the Trust Territory air service carried 285,530 pounds of cargo, of which approximately 60 percent was government cargo. Movement of cargo along, and between, air service routes is shown in Table IV.

Table IV

Trust Territory Air Cargo

Fiscal Year 1965

Air Service Route	Revenue Ton Miles
Northern Route	3,710
Southwestern Route	14,930
Southeastern Route	29,630
North to Southwest	8,395
North to Southeast	7,385
Southeast to North	6,160
Southeast to Southwest	4,020
Southwest to North	3,180
Southwest to Southeast	8,875
Total	86,285

Source: Compiled from figures supplied by the Trust Territory Department of Transportation.

Although passenger and cargo data are not available in a form which will permit a breakdown by class (government/non-government) or route for years before and after fiscal year 1965, the total numbers of passengers and the total amounts of cargo carried in fiscal years 1962, 1963 and 1964 are compared with the total cargo and passengers carried in fiscal year 1965 in Table V. Also shown is mail carried during those years. Mail reported for 1965 was based on calendar year data which are not directly comparable to the fiscal year data given for previous years.

Table V

Total Passengers, Cargo, and Mail Carried
by Trust Territory Air Service

Fiscal Years 1962 - 1965

	1962	1963	1964	1965
Number of Passengers	8,160	17,807	19,205	24,270
Pounds of Cargo	95,397	234,438	290,480	285,530
Pounds of Mail	81,647	155,399	195,115	225,000 (est.)

Source: Trust Territory Department of Transportation.

It is of considerable importance that the number of passengers and the amounts of cargo carried tripled between fiscal years 1962 and 1965. From 1962 to 1964, the volume of air mail more than doubled. The increase in appropriated funds, from $6 million to $15 million between fiscal year 1962 and fiscal year 1963, can probably account for the dramatic increase in air passengers and cargo during those years as official passengers and official cargo were dispatched to inaugurate new government programs. Because appropriations increased by a relatively modest 16.5 percent from 1963 to 1965, it is unlikely that government passengers and cargo were the only contributors to the 35 percent increase in air passenger traffic and the 21 percent increase in air cargo which characterized the three-year period. The higher Micronesian incomes which were derived from government expenditures undoubtedly increased the number of commercial air passengers and the amount of commercial air cargo.

Air Service Economics

The economics of the current Trust Territory air service are difficult to assess for three basic reasons. First, only a portion of the revenues which the service generates has appeared in the air service accounts. Although new accounting procedures are shceduled to be introduced during fiscal 1968

1967, it never was the practice of the Trust Territory Government to bill or ticket official passengers or cargo in the past. Second, operating costs are determined by the mileage rates charged by the operating contractor. These rates reflect operating costs and the profits of the contractor. No detailed breakdown of internal costs, such as the costs of Trust Territory Immigration Service, internal baggage handling, or airplane servicing in the district centers is currently available. Finally, as in the case of sea transportation, air transporation data have never been consistently or systematically collected. Thus, analysis is restricted to operations during fiscal year 1965, the only year for which there are sufficient data to allow any meaningful conclusions to be drawn.

Air Service Revenues. Total air service revenues in fiscal year 1965 amounted to $323,169.72, as indicated by Table VI. These revenues were received from commercial air passengers, commercial air freight, and payments made by the U.S. Post Office for air mail.

Table VI

Trust Territory Air Service Revenues

Fiscal Year 1965

Passenger Revenues	$287,413
Air Freight Revenues	15,756
U.S. Mail Contract	20,000
Total Revenues	$323,169

Source: Trust Territory Department of Budget and Finance.

As mentioned above, no charge was made against official cargo or for official passengers during fiscal year 1965. Missionaries and students were allowed to travel at one-half of the regular fare. All other passengers paid basic fares amounting to ten cents per mile on the northern and southwestern routes. Because of high-cost SA-16 operations on the southeastern route, passenger fares on this route were computed at twelve cents per mile. While special roundtrip and family passenger rates were introduced and cargo tariffs were reduced by 50 percent in May, 1966, the basic rate structure of 1965 is still in effect at the present time. Trust Territory air passenger and cargo rates are among the highest in the world.

During fiscal year 1965, 8,045,758 passenger miles were flown. Over one-half of the total passenger miles, 4,624,450, were flown on the southeastern route. Table VII presents a breakdown of official and non-official passenger miles flown along each route.

Table VII

Official and Non-official Passenger Miles Flown on Trust Territory Airline Routes

Fiscal Year 1965

	Official Passenger Miles	Non-official Passenger Miles	Total
North	466,406	991,114	1,457,520
Southwest	883,704	1,080,084	1,963,788
Southeast	2,127,247	2,497,203	4,624,450
Total	3,477,357	4,568,401	8,045,758

Source: Compiled from data obtained from the Trust Territory Department of Transportation.

If all non-official passengers had been charged full fare, the total passenger revenues in fiscal year 1965 would have amounted to approximately $506,000. It is assumed that the discrepancy between this figure and the actual passenger

revenues realized, $287,413, is due to missionary and student travelers, inaccuracies in air service data, and/or failure to collect or to record fares. It is interesting to note that passenger revenues would have amounted to $893,384 if all passengers, including official passengers, had been billed at commercial rates.

Air freight rates in the Trust Territory were four cents per pound per 100 miles, or fraction thereof, during fiscal year 1965. A few commodities, such as handicrafts, movie films, locally grown produce and emergency food supplies moved at somewhat lower special rates. Official air cargo was not billed. Total air freight revenues amounted to $15,756.26 for the year. If all cargo, both official and non-official, had moved at commercial rates, total cargo revenues would have amounted to $77,156.

Under a long standing contract with the United States Post Office, the Trust Territory Government receives $20,000 per year for carrying U.S. mail. Because of increases in the volume of air mail since the contract with the United States postal service was negotiated several years ago, the Trust Territory Government has sought an upward adjustment in the

contract figure but attempts to renegotiate this contract have been unsuccessful to date. Immediate action should be taken by the Trust Territory Government to prepare a formal presentation for submission to the United States Post Office Department to initiate a contract change, which appears to be justified.

Table VIII

Comparison of Trust Territory Air Service Revenues Realized and Revenues Implied (all Passengers and all Cargo Charged at Commercial Rates)

Fiscal Year 1965

	Realized Revenues	Implied Revenues
Passengers	$287,413.48	$893,384.00
Air Freight	15,756.24	77,156.00
U.S. Mail	20,000.00	20,000.00
Total	$323,169.72	$990,540.00

Air Service Costs. Direct operating costs for the Trust Territory air service are determined by the number of miles flown under the terms of the operating contract with Pan American. Total payments made to the contractor amounted to $806,652.73 in fiscal year 1965. Air service miles flown, by route and type of aircraft, are shown in Table IX.

Table IX

Total Nautical Miles Flown by Type of Aircraft and Air Service Route

Fiscal Year 1965

Air Service Route	Nautical Miles Flown DC-4	SA-16	Total Combined Nautical Miles
North	47,503	242	47,745
Southwest	60,212	16,212	76,424
Southeast	57,996	187,408	245,404
Total	165,711	203,862	369,573

Source: Trust Territory Department of Transportation.

In addition to payments made directly to the operating contractor, other direct payments were made for United States Immigration Service, baggage checks, and other incidental items. These payments amounted to $18,735.08. Total direct operating costs, including the operating contract and incidental costs, amounted to $825,287.81.

All Trust Territory air service revenues were paid into the Trust Territory air service revolving fund. All disbursements were made from this fund. The revolving fund also received an appropriation amounting to approximately $500,000 to compensate

for the deficit ($502,118.09) created by the discrepancy between revenues and direct costs.

Generally, appropriations to the air service revolving fund have been regarded as an air service subsidy. In fact, however, because official passengers and official cargo have not been billed to the component administrative units of the Trust Territory Government, the appropriation has actually been a Trust Territory air transportation fund established in lieu of allocating funds to cover the transportation costs required to support individual departments and programs. In a very important sense, the Trust Territory air service pays most of its own way. As indicated in Table X, if all passengers and cargo had paid commercial rates, and if such hidden costs as depreciation on aircraft, internal immigration and quarantine service, service for aircraft in the district centers, and executive time spent in administering the air service, are ignored, the air service would have shown a substantial profit in fiscal year 1965. Even the hidden costs were not so substantial as to cause the air service to show a significant loss.

Table X

Implied Revenues (all Passengers and Cargo Charged at Commercial Rates), Direct Operating Costs, and Implied Profits of the Trust Territory Air Service

Fiscal Year 1965

Implied Revenues:	
Passengers	$893,384.00
Air Freight	77,156.00
U.S. Mail	20,000.00
Total Implied Revenues	$990,540.00
Direct Operating Costs:	
Pan American Airline (contract)	$806,552.73
Other (baggage checks, Immigration, etc.)	18,735.08
Total	$825,287.81
Implied Profit:	$165,252.19

Evaluation of Trust Territory Air Service

The air transportation service in the Trust Territory has developed to a stage where it serves a much broader function than the original function of providing logistic services for the Trust Territory Government. As shown in the various sets of data presented above, both the numbers of non-official passengers

and the non-official passenger miles flown exceed the number of official passengers and official passenger miles. If the Trust Territory is to achieve the maximum potential rate of social and economic development, it is essential that air service be expanded and air service costs be reduced.

It is quite obvious that the current air service has considerable commercial potential. Even with the present extremely high operating cost, the air service is probably making profits, or at least coming close to the break-even point at the present commercial rates and levels of service. By reducing air fares and cargo rates, by increasing service, by promoting traffic and cargo, and by introducing professional management, the economic performance of the air service could undoubtedly be significantly improved.

The general development objective provides a sufficiently impelling rationale to justify further improvements in air transportation in the Trust Territory. But important additional benefits can be realized from improved air transportation in the form of increased government efficiency and decreased official travel costs. Although the new air service schedules are a great improvement, the following analysis of official

travel during fiscal year 1965 illustrates the type of administrative inefficiencies which result from inadequate air transportation.

Approximately 3,000 air passengers on official travel for the Trust Territory Government departed from Guam for points in the Trust Territory during fiscal year 1965. Because of the limited Trust Territory air service, none of these official travelers could spend less than twelve hours on Guam once they arrived there. In some cases, official travelers were forced to remain on Guam for as long as thirty-six hours en route from one district to another. Assuming that all officials spent the minimum possible time on Guam, per diem payments for time spent on Guam alone would have amounted to approximately $25,000, without regard to the value of services lost.

It is impossible to determine from the existing data the number of official passengers who made roundtrips from one district to another during fiscal year 1965. For this reason, it is hazardous to guess at total per diem costs of forced delays and layovers for such trips. But the airline schedules indicate that such costs were bound to have been high.

In order to make a trip to Palau, a government employee had to leave his duty station on Saipan on Thursday afternoon. He proceeded to Guam where he waited until Friday morning (12 hours) for the plane to Palau. He arrived in Palau Friday afternoon. After spending the weekend in Palau, he was able to begin attending to his business on Monday. He departed from Palau on Friday morning. After spending twelve hours in Guam, he returned to Saipan on Saturday. All told, the employee spent approximately nine days away from Saipan to work four days in Palau. Per diem paid for non-productive time amounted to over $50. The salary which the employee received for non-productive time could have amounted to some multiple of this figure, depending on the employee's status.

Because all districts except the Marianas District received air service only on a weekly or semi-weekly basis, many government employees undoubtedly stretched their work in each district so as to keep busy all week. A more important aspect of this problem is that headquarters supervisory personnel were reluctant to leave their offices on Saipan for the prolonged periods required to visit the districts. To the degree that headquarters personnel lack familiarity with district problems

because of poor transportation, a very real cost in terms of low efficiency and morale must be attributed to the infrequency of the transportation service.

The basic deficiencies of the Trust Territory air service are institutional rather than physical. Current plans do not provide for the utilization of Trust Territory aircraft at the most economical levels. Yet some physical problems do exist. The most important of these problems is the restriction on the operations of DC-4 aircraft caused by the lack of landing facilities in Ponape. This particular problem will be solved when the construction of the Ponape landing strip is completed within the next two years.

In a 1965 report on a recent survey of airports, navigation aids, and communications in the Trust Territory, the Federal Aviation Agency (FAA) highlighted a number of serious physical defects which should be corrected to insure safe air travel and to provide a base for the expansion of air service. In regard to airports, FAA recommended that all landing strips except the one on Saipan be increased in width and length. No construction cost estimates were made on airport rehabilitation. In regard to navigation aids, it was estimated that over $400,000 worth of new equipment is needed.

A more recent survey conducted by the Civil Aeronautics Board (CAB) resulted in a CAB recommendation that landing lights be installed at all airports, particularly at Saipan. Landing lights would allow night flights and would provide a considerable increase in scheduling flexibility. Temporary but adequate lighting could be installed for about $25,000 per airport, or for a total cost of about $150,000 for all six of the district center airports.

RECOMMENDATIONS AND SUGGESTED PROGRAMS

Explicit transportation policy goals should be established by the Trust Territory Government. These policy goals should be designed to meet the present and projected over-all transportation requirements of the Trust Territory.

The transportation system of the past has catered almost exclusively to administrative needs, as sometimes modified by political pressures. No set of transportation policy goals should ignore administrative and political requirements. But neither should social and economic development needs be ignored. Transportation policy should provide for future as well as for current transportation requirements. Maximum social and economic development requires a transportation system which is growing at a sufficient pace to provide increased services as needed. In other words, if transportation does not to some degree lead development, the lack of transportation services will produce bottlenecks and will retard development.

A transportation system capable of meeting the present and future needs probably will not be entirely self-supporting. That is, the fares and freight rates to be paid by governmental and private users for services rendered to them may fall short

of the total cost of investments and operations. Commercial operators, therefore, cannot be expected to provide adequate service without substantial government participation. Some segments of the transport system, such as the logistic maritime service, may require only protection against competition and the concomitant government regulation of performance and rates. Other segments, such as the air service, may need subsidy in addition. Still others, such as the maritime station services, might be performed best by direct government operation, because they primarily serve government purposes.

Where subsidy to private operation is required, it must be regarded as a price paid for those administrative, social and political benefits to the development of the Trust Territory which flow from the availability and use of transportation facilities--over and above the benefits resulting directly from the specific trips and freight movements for which charges are collected. These additional benefits are not readily measurable but are nonetheless real and potentially substantial. With these benefits taken into account, the system should not operate with a "deficit." But evaluations of administrative, social and political returns are subjective at best. For this reason, decisions should be

based on the relationship of direct revenues to cost whenever possible.

It is recommended that the transportation system be regarded as consisting of three component services—logistic vessel service, station vessel service and air service. By evaluating each of these services separately, as has been done in this chapter, greater precision can be achieved in determining cost-benefit ratios, in determining the potential for each service to become self-supporting, and in designing the necessary organizations to enable each component to provide the best suited and most efficient service to meet the specific needs of the Trust Territory.

Logistic Vessel Service

The commercial operations of the logistic service now support the administrative operations of the station service. So long as this practice is continued the water transportation system will not contribute as greatly as it should to the creation of an environment in which economic development can take place. The following sub-sections provide specific recommendations for an improved logistic service.

Logistic Service Operations. As soon as possible, the Trust Territory Government should dispose of its logistic vessels and cease to participate in logistic operations. The logistic service has already been shown to have considerable commercial potential. Under a franchise arrangement, whereby a commercial operator would have exclusive rights to carry all cargo entering Trust Territory and all cargo moving between districts, it will be possible to introduce more suitable vessels, to reduce freight rates and to increase the frequency of logistic service to most Trust Territory ports.

Representatives of Micronesian Line, the current operator of Trust Territory logistic vessels, have indicated that in return for a franchise which did not demand the forfeiture of large portions of logistic service revenues to the Trust Territory Government, the Company would be willing to add fast, modern passenger/cargo vessels to the service. Two such vessels could replace the present obsolete vessels and almost double the frequency of logistic service to district centers. Further, because of the more economical operating costs of modern vessels, significant reductions in rates would be feasible.

Selection of a Logistic Service Operator. In awarding a franchise to a private carrier to operate the Trust Territory

logistic service, it is essential that the primary criterion for awarding the franchise be the ability of the prospective operator to offer high quality, low-cost service. United States operators, as well as Micronesian operators, should be considered as eligible for the franchise. Micronesians should be given the opportunity to compete for the franchise on an equal basis. But under no circumstances should "Micronesian preference" be allowed to modify the "quality of service" criterion. The shipping service is much too vital to all the people to allow the standards to fall and the costs to rise for the sake of trying to create a favored economic position for a very few.

Excessive protection of Micronesians can only result in perpetual inefficiency. If Micronesians do not yet possess the technical skills and capital to compete with foreigners, no single measure will contribute to their acquisition of skills and resources more rapidly or effectively than the introduction of high quality and efficient transportation services in the Trust Territory.

Logistic Vessel Flag Privileges. All privileges enjoyed by United States flag carriers should be extended to the operator of the Trust Territory logistic service. To the extent that

such a status would make the Trust Territory carrier a preferred carrier, by virtue of its exclusive franchise to carry Trust Territory cargo, such a preferred status is justified by the unique economic and political status of the Trust Territory. The scanty resource base of the Trust Territory and the political restrictions which are detrimental to development can only be overcome by imaginative policies which will help ensure financial success and opportunities for growth for Trust Territory oriented enterprises.

Logistic Service Administration and Regulation. Assistance in the regulation and administration of the commercial Trust Territory logistic sea service should be obtained from United States maritime regulatory agencies. Since the Trust Territory Government cannot economically amass all the resources and skilled personnel required for effective marine regulation, the services of competent experts from both the United States Maritime Commission and the United States Coast Guard would be of great value.

If, as recommended above, the logistic service becomes a privately owned and operated commercial service, a formal means of regulating rates, standards of passenger service, routes

and schedules will be a necessity. The economic interests of both the public and the logistic service operator will demand expert attention. The Trust Territory Government cannot afford and does not need to maintain a staff possessing the requisite technical expertise; nor can it afford to discharge its regulatory responsibility without expert assistance.

Even more important than economic regulation is safety regulation. While the current operator of the logistic vessels maintains that the vessels meet international, SOLAS (Safety of Life at Sea) standards, inspections are infrequent and superficial. A Trust Territory Board of Marine Inspectors has been established, but because of the scarcity of trained personnel to serve on the Board, it functions only as a formal agency to issue vessel and personnel licenses--often without inspections or examinations. An arrangement with the United States Coast Guard to perform courtesy inspections at the request of the Trust Territory Government has proved to be much too casual, especially since the seriousness of deficiencies is evaluated by administrators who may or may not have technical maritime competence. If the Trust Territory Government is to exercise its enforcement power to assure vessel safety and officers' competence, the seriousness of this responsibility must be reflected in its

administrative organization and the employment of technical expertise in judging marine operations.

To extend the jurisdiction of United States regulatory agencies to the Trust Territory and to subject all Trust Territory vessels to United States registration would relieve the Trust Territory Government of these responsibilities. But this relief would be costly indeed. Subsidy is required for most maritime operations meeting United States standards. Transfer of jurisdiction to U.S. agencies almost certainly would also require the subsidization of a logistic service in the Trust Territory which would otherwise be self-supporting. Such costs need not be incurred, but reasonable standards of efficiency and safety must be set and enforced. The Trust Territory Government could discharge this responsibility by means of a contractual relationship with appropriate regulatory agencies which can provide continuing technical services on a reimbursable basis. Without some such arrangement, the Trust Territory will face serious difficulties in establishing an adequate logistic service.

Station Vessel Service

Despite certain commercial aspects of station vessel operations, station vessel service is primarily an administrative

service. Further, as outer island populations decline and government programs expand, the administrative aspects of the service will become more pronounced over time. The following sub-sections provide specific recommendations for improved station vessel service.

Station Service Operations. The Trust Territory Government should assume direct operating responsibility for station vessel service which should be administered directly by the Trust Territory Department of Transportation. The Transportation Officer should have complete responsibility for personnel, vessel operations, scheduling and dispatching. Operating expenses should be budgeted and appropriated, and revenues from commercial cargo should be regarded as incidental and remitted to the Trust Territory general fund.

As an alternative recommendation, a corporation, wholly owned by the Trust Territory Government, should be established to operate the station vessel service. In this case, all users of the service, government as well as commercial users, would be billed and all revenues would be treated as commercial revenues. Sliding scale subsidies would be necessary.

The advantage of the first recommendation would be that the station vessel service would be operated in the context of

existing administrative procedures. Operations would be directly oriented toward providing vessel services in somewhat the same manner as a motor pool provides motor vehicle services. Maximum flexibility for providing administrative services would be achieved. The disadvantage of this type of service would be that commercial aspects of station vessel service would be minimized.

While the second recommendation would result in a more complex operation, greater recognition would be given to commercial needs. Further, corporate accounts and management procedures would provide much better cost analysis and operational controls. Depreciation accounts could be maintained, and accounting profits (or deficits) could be used as measures of efficiency.

The implementation of either recommendation would constitute a recognition of the limited economic potential of the station vessel service. Also, the managerial and financial inadequacies of the present Micronesian station vessel operators would be recognized. Failure to recognize these features of the station vessel service will result in an inferior service which cannot adequately provide for the needs of administration or commerce.

Current operations of station service vessels result in a basic conflict between the administrative and commercial functions performed by the vessels. The commercial incentives which are built into the operating contracts tend to work in direct opposition to the performance of administrative services. After spending days or weeks at sea, medical technicians and other administrators are allowed no more time on an island than is required to load copra and unload trade goods. Diversions of vessels for purely administrative reasons can and do aggravate the financial problems of the vessel operators.

The implementation of either alternative recommendation can probably be accomplished by an administrative directive from the High Commissioner. Personnel changes and financial losses to the current operators would be minimal. The additional cost to the Trust Territory Government would be less than the cost of trying to bring the present operations up to minimum acceptable standards.

Station Service Vessels. The Trust Territory Government should supply its station service with vessels suitable to the unique administrative and commercial requirements of this service. Dormitories and food service facilities should be

provided for "deck class" passengers. More cabins should be available for those who desire and can afford more comfortable quarters. Each vessel should have a small, well equipped medical clinic so that medical personnel can give adequate care to the outer island people. A ship's store to handle trade goods, and other specialized facilities should be considered in the vessel design. Vessel speed is also of importance when high salaried government technicians and administrators make prolonged field trips, when medical emergencies arise, when tourists and others want to visit outer islands, and when the marginal commercial benefits of rapid transportation are considered.

The present station vessels were not designed to meet the needs of the station service. For the most part, they were designed to carry copra and trade goods with little or no thought given to passenger or administrative needs. The primary concern in designing them was economy of construction.

Funds should be allocated to acquire the services of a qualified marine architect to carefully study vessel requirements and to design vessels suited to present and future Trust Territory station service needs.

Standards of Station Vessel Performance. Regardless of the organization of station service operations, immediate steps should be taken to increase the standards of station vessel operations. Not only are higher standards necessary for efficient and safe vessel operations, but the vessels themselves should be used to train Micronesian crewmen and officers. Further, because the station vessels represent the more sophisticated outer world, as well as the Trust Territory Government, to the people of the outer islands, vessel operations should serve as an example of modern technology and efficiency.

Station vessel operations have rarely been adequately supervised. Maintenance has been left to the Micronesian operating companies which employ only Micronesian crewmen and Filipino officers. The companies have neither the financial nor technical resources to maintain safe and efficient vessels. A recent drydock inspection of one vessel, for example, revealed that the vessel had no fire sprinkler system, and that none of the fourteen fire extinguishers was in working order. High standards for general operations should be prescribed and enforced by the Trust Territory Department of Transportation with the advice and assistance of technical experts.

Air Service

The commercial potential of air service in the Trust Territory is promising. Both public and private sector development will provide a growing demand for air transportation. Further, a large portion of the base required for expanded air service has already been established. At this point in time, efforts should be devoted to making the base more adequate for expanded air operations, and developing an air transport organization capable of meeting the changing and growing needs of the Trust Territory. The following sub-sections provide specific recommendations for improved air service.

Air Service Operations. As soon as possible, the operating responsibility for Trust Territory air service should be passed to a dependable privately owned and operated air carrier. The Trust Territory Government does not possess the technical resources required to manage and administer a scheduled airline. Also, by inducing private capital to invest in the air service, scarce government resources can be devoted to other activities.

Given the present air service requirements, relative to possible air service revenues, it is not likely that a

commercial airline will be immediately self-supporting. For this reason, it will probably be necessary to offer minimum revenue guarantees, or some other form of subsidy, and an exclusive Trust Territory franchise to any prospective air service operator in order to ensure that adequate air service will be provided. In return for such guarantees, the operator should provide a specified minimum level of service.

Selection of An Air Service Operator. As in the case of logistic sea service, it is essential that the criterion for selecting an air service operator be the ability of the operator to offer safe, dependable and efficient service. Strict adherence to this criterion will probably demand that the air service franchise be offered to an established United States airline company.

Air Service Administration and Regulation. For precisely the same reasons that the regulation and administration of Trust Territory maritime operations should require the assistance of experts from the United States Maritime Commission and the United States Coast Guard, it is recommended that the Trust Territory air service be administered with technical assistance by the Civil Aeronautic Board (CAB) and the Federal Aviation Agency (FAA). The Trust Territory Government has virtually no

experience in providing the type of regulation which a commercial air operations will require.

Specialized expertise is required to collect and analyze air service data; to assess passenger traffic and cargo potential; to determine air routes, schedules, passenger fares and cargo rates; and to regulate general commercial air operations. With a United States operator licensed by the Trust Territory, the CAB would in any event have some control over its operations. With little extra effort, it could advise the Trust Territory Government so as to ensure the necessary quality of economic regulation.

In regard to prescribing technical standards of airports and aircraft, and establishing and enforcing air safety and air traffic regulations, it may well be impossible for the Trust Territory Government ever to meet the competence and the efficiency of FAA. Certainly, it could not do so except at tremendous cost.

It may be feasible to place Trust Territory airport and airway construction and operation under the jurisdiction of FAA and to establish a close working relationship with this agency. At the very least, the possibility of having FAA provide continuing assistance to the Trust Territory Government on a reimburseable basis should be explored.

Assessment of New Air Service Routes. Because Guam is the only entrance to the Trust Territory, feasibility studies should be conducted to determine the practicality of establishing direct air service between the Marshalls District and Hawaii to provide an eastern outlet for the Territory. At such time as a decision is made to promote the very promising Japanese tourist market, consideration should be given to providing direct air service between Saipan and Japan. This recommendation is in accord with the results of a recent survey by a technical group made available by CAB.

Looking to a possible tourist market in the United States, the eastern boundary of the Trust Territory is approximately 1,800 miles east of Guam, and is slightly less than one-half as far from Hawaii as is Guam. An American traveler wishing to go to the Marshalls District must travel 7,200 miles further, roundtrip, than he would have to travel if direct transportation was available. In terms of expense, given present transpacific air fares and Trust Territory air fares, the cost to the traveler would be approximately $700 greater via Guam than via direct air service between the Marshalls District and Hawaii. Even the traveler who wishes to visit both Guam

and the Marshalls District is now required to travel an extra 3,600 miles at an extra cost of $364.

An increased number of air service entrances to, and outlets from the Trust Territory will be essential for the development of tourism and other industries. The development of these industries will, in turn, eventually determine the potential of commercial aviation in the Trust Territory.

RESOURCE REQUIREMENTS FOR TRANSPORTATION DEVELOPMENT

Historical discontinuities in growth patterns, resulting from major changes in Trust Territory Government expenditures and Trust Territory Government policies, make it hazardous to project future levels of economic activity in the Trust Territory over any appreciable period of time. Yet, transportation projections are especially necessary because the industry must lead many phases of development, and efficient government operations require adequate transportation services to facilitate major expansions in administrative programs and activities.

This section presents projections of transportation requirements and resource needs over the next five years. These projections are based on the following three basic assumptions:

1. The Trust Territory Government's annual budgets will range between $35 and $40 million.

2. Economic development in general, and tourism in particular, will be actively promoted by the Trust Territory Government.

3. Many of the present restrictions on movements of people into and out of the Trust Territory will be removed.

It is virtually certain that the doubling of government expenditures which is expected to occur during the next year or two, augmented by the dollar impact of the Peace Crops program, plus the re-spending effect of these large injections of new dollars, almost immediately will more than double the demands for transport services. Private enterprise expansion resulting from the increased dollar flow in the Trust Territory will further increase transportation demands. Equally important, the feasibility of many enterprises will depend on the availability, frequency, standards, and costs of these services.

A projected three-fold increase in transportation service needs, given the assumptions listed above, can be taken as a minimum which is almost certain to occur.

While much of the capital investment required to meet the increased transportation needs can be provided by private

investors, a sizeable part of the cost of facilities and equipment must be borne by the Trust Territory Government in order to fulfill its responsibility for ensuring an adequate transportation infrastructure. The estimated investment requirements presented in the following sub-sections include both Government and private investment and do not distinguish between the two.

Logistic Service Projections

By 1972, the logistic service will require at least two modern passenger/cargo vessels, each of 7,000 to 8,000 gross tons, capable of carrying 100 cabin class passengers, probably capable of speeds of between 15 and 18 knots, and specifically designed to meet the passenger and cargo needs of logistic service to, from, and within the Trust Territory. It is anticipated that cargo will at least triple between 1966 and 1972, and that surface vessel passenger travel will require the recommended increase in cabin accommodations.

Given an estimated total market value of approximately $500,000 for the three logistic vessels currently in service, it is estimated that a net investment of $4.5 to $5 million will be required for the new logistic vessels. The new vessels are anticipated to cost $2.5 million to $3 million each.

Labor requirements for logistic service operations will range between 400 and 500 persons. At least 25 percent of the persons employed will be non-indigenous to Trust Territory, regardless of the amount of unskilled labor available in the Territory. Micronesians do not yet possess many of the skills required to operate an efficient logistic service. By importing the necessary supervisory and technical people, the service can operate efficiently and Micronesians can begin to learn to perform the tasks which require great degrees of skill.

In addition to the above investment and labor requirements for logistic sea service, shoreside facilities such as warehousesand docks must be constructed and maintained. This will require an investment of between $4 and $5 million over the five year period, and 1,000 to 1,200 man years of construction labor, or will provide 200 to 250 full-time construction jobs throughout the five-year period.

Again, regardless of the amount of unskilled labor available locally, many required construction skills will not be found in the domestic labor market. Skilled construction workers must be imported. During this initial five-year period, at least 50 percent of the construction jobs must be filled by non-indigenous workers.

Station Service Projection. It is estimated that [illegible] designed and efficiently operated station vessels can provide adequate field service throughout all six of the districts of the Trust Territory. Each inhabited island can be visited on a monthly schedule.

Four vessels, between 600 and 750 gross tons in size, capable of speeds from 10 to 15 knots and properly equipped to provide needed passenger and cargo services will represent a total investment of $2 to $2.5 million. Given the estimated market value of the present station vessels, about $500,000, a net investment of $1.5 to $2 million will be required.

It is anticipated that the station service alone can provide between 150 and 200 jobs. As in the case of the logistic service, at least 25 percent of station service jobs will require skilled people from outside the Trust Territory.

Air Service Projections. Given the assumptions on which these projections are based, spectacular increases may be anticipated in air passenger and air cargo traffic over the next five years. As a minimum estimate, air passenger traffic will triple and air cargo may increase as much as ten-fold. Daily air service to each district will be a minimum requirement.

No less than two, and perhaps three, modern turbo-prop or pure-jet aircraft will be needed to provide air service. These aircraft, valued at between $2 and $2.5 million each, and their accessory equipment will demand a gross investment of $5 to $8.5 million. The disposal of the present air service equipment will yield an estimated $400,000 to $500,000, thereby resulting in a net investment only slightly less than the estimated gross investment.

Given the high proportion of professional and skilled jobs in the air transport industry, at least 50 percent of the 150 to 200 jobs which the air service system will create must be filled by non-indigenous personnel.

In addition to investment in operating equipment, an estimated $500,000 is required for navigational aids. Also, between $4 and $6 million (including $2 million for the Ponape airfield) is estimated to be required to bring present airfields to standards adequate for commercial operations. This construction will create 250 to 300 full-time construction jobs for the five-year period of development.

Summary of Transportation Development Requirements. Table XI and XII present summaries of estimated capital and

labor requirements for the development of transportation over a five-year planning period. It must be recognized that the figures reflect general magnitudes and should not be regarded as precise cost estimates. Such cost estimates can only be made after intensive architectural and engineering studies have been completed.

Table XI

Estimated Net Investment Requirements for Transportation Development
(Includes both Private Investment and Government Investment)

(million of dollars)
1967 - 1972

Logistic Service:	
Vessels	$ 4.5 - 5.0
Construction (Warehouses and Docks)	4.0 - 5.0
Total	$ 8.5 - 10.0
Station Service:	
Vessels	$ 1.5 - 2.0
Total	$ 1.5 - 2.0
Air Service:	
Aircraft and Accessory Equipment	$ 5.0 - 8.5
Navigational Aids	.5 - .5
Airport Construction and Rehabilitation	4.0 - 6.0
Total	$ 9.5 - 15.0
Total for all Sea and Air Transportation:	$19.5 - 27.0

Table XII

Estimated Labor Requirements for Transportation Development

(Number of people required, including managerial, technical, supervisory, skilled, semi-skilled, and unskilled)

1967 - 1972

	Indigenous Labor	Non-Indigenous Labor
Logistic Service:		
Operations	300 - 325	100 - 175
Construction	100 - 125	100 - 125
Total	400 - 450	200 - 300
Station Service:		
Operations	110 - 150	40 - 50
Total	110 - 150	40 - 50
Air Service:		
Operations	75 - 100	75 - 100
Construction	125 - 150	125 - 150
Total	200 - 250	200 - 250
Total for all Sea and Air Transportation	710 - 850	440 - 600