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DEVELOPMENT

STRATEGY

GUAM

1978



Bureau of Planning
Government of Guam
Agana, Guam

THE FIVE-YEAR ECONOMIC DEVELOPMENT STRATEGY
TERRITORY OF GUAM

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ECONOMIC PLANNING DIVISION
BUREAU OF PLANNING
GOVERNMENT OF GUAM
AUGUST 1978



TERRITORY OF GUAM
OFFICE OF THE GOVERNOR
AGAÑA, GUAM 96910
U.S.A.

RICARDO J. BORDALLO
GOVERNOR



Hafa Adai!

Guam must attain balanced economic growth which will bring increased income and employment opportunity for the present and future generations. To achieve this, Guam must better use its existing resources and realize the full potentials that can be derived from tourism, industry, agriculture and fisheries. This plan seeks to bring the island toward an economic condition that finds us producing more goods and services with less reliance on costly imports.

Our economic resources partially determine the developmental potential of the economy. Having assessed these resources and identified basic objectives, the Bureau of Planning has outlined a strategy for economic development during the next five years. I am pleased to present this plan which will guide Guam towards much-needed economic growth.

Si Yuns Laase,

RICARDO J. BORDALLO

Table of Contents

	<u>Page</u>
List of Tables	ii
List of Figures	iv
Introduction	1
I. Overview of the Economy	3
A. The Area	3
B. Population	4
C. Cost of Living	4
D. Income and Wages	8
E. Private Sector	10
F. Public Financial Resources	18
G. Infrastructure	23
H. Manpower Resources	29
II. Developmental Strategies	35
A. Federal Government	37
B. Visitor Industry	55
C. Industrial Development	77
D. Agriculture	97
E. Fisheries	113
Appendix A: Summary Of Manpower Programs On Guam, 1977	133
Appendix B: List Of Federal Agencies On Guam	139
Appendix C: Government Of Guam Organizational Chart, FY 1979	140
Bibliography	141

List of Tables

<u>Table</u>	<u>Page</u>
I- 1 Estimates Of The Civilian Population Of Guam, By Age, And Citizenship - September 1975	6
I- 2 Civilian Population, By Ethnic Group, 1975	7
I- 3 Guam Consumer Price Index, (September 1972=100)	8
I- 4 Families On Guam By Money Income Level, 1976	9
I- 5 Personal Income On Guam: 1970-1974	10
I- 6 Earnings Of Production Or Non-Supervisory Workers On Private Payrolls On Guam By Industry Division, January 1978	11
I- 7 Summary Of Post-Typhoon Projects	12
I- 8 Commercial Aircraft Landings, Guam International Air Terminal: FY 1970-1977	14
I- 9 Total Surface Revenue Cargo: FY 1970-1977	14
I-10 Consolidated Gross Business Receipts By Sector: FY 1971-1976	16
I-11 Sources Of General Fund Revenue: FY 1973-1977	19
I-12 Summary Of General Fund Operations: FY 1973-1977	20
I-13 Cumulative Gain (Loss) And GovGuam Subsidy To Auto- nomous Agencies Through FY 1977	22
I-14 Classification Of Guam's Highway System By Lanes And Types, 1977	25
I-15 Island Power System, 1970-1977	26
I-16 A Summary Of Subscribers And Revenue Of Guam Telephone System: FY 1970-1977	27
I-17 Water Production And Supply Resources: 1977	28
I-18 Water Consumption: FY 1970-1977	29
I-19 Civilian Labor Force, Percent Of Population, 16 Years And Over, By Sex	30

<u>Table</u>	<u>Page</u>
I-20 Highlights Of The Employment And Unemployment Situation On Guam	31
I-21 Employees On Payrolls On Guam, By Industry, 1971-1977	33
I-22 Projected Labor Supply, 1982	34
II- 1 Federal Outlay On Guam, FY 1972-1977	38
II- 2 Federal Employment On Guam	38
II- 3 Department Of Defense Outlay On Guam: FY 1973-1977	41
II- 4 Number of Graduates, U.S. Naval Apprentice Program: 1967-1977	42
II- 5 Patterns Of Federal Land Ownership, 1976	44
II- 6 Visitor Arrivals And Total Number Of Rooms In Guam's Hotel Industry, 1969-1977	55
II- 7 Distribution Of Visitor Arrivals By Country Of Origin, 1969-1977	56
II- 8 Projected Visitor Arrivals And Expenditures On Guam, 1978-1983	57
II- 9 Visitor Expenditures Per Person Per Trip, By Type Of Expenditures	62
II-10 Manufactured Goods Exported To The United States Under Headnote 3(a)	81
II-11 Production And Importation Of Fruits And Vegetables In Pounds, FY 1970-1975	99
II-12 Local Production, Imports And Total Consumption Of Major Agricultural Products In FY 1974	99
II-13 Poultry And Livestock Population: FY 1971-1977	100
II-14 Crops Recommended For Expanded Cultivation	103
II-15 Estimated Current Annual Retail Value Of Seafood And Fish Products Consumed By Households On Guam	116
II-16 Fish Catch And Value: FY 1971-1976	118
II-17 Mariculture Estimations For Guam	120

List Of Figures

<u>Figure</u>		<u>Page</u>
I- 1	Guam Population Projections	5
I- 2	General Fund Expenditures: FY 1977	21
II- 1	Releasable Area/Land Acquisition, Island of Guam	45
II- 2	Apra Harbor Complex	46

INTRODUCTION

Soon after a security ban was lifted in 1962, Guam experienced a phenomenal rate of growth. Much of the unforeseen and rapid development, though characterized as an economic boom, brought the adverse effect of unplanned growth. In recognition of problems such as increased pollution, incompatible land uses, reduction of wildlife and loss of agricultural lands, a Comprehensive Development Plan for Guam has been prepared. To provide technical support for the island's master plan, this document presents a five-year strategy toward responsible economic development on Guam.

Formulation of the logical directions for growth necessitated a basic assessment of the island's economy. This involved the definition of economic sectors and identification of current problems, as well as the potential for growth within each sector. The five sectors most capable of contributing to economic development are the Federal government, visitor industry, manufacturing, agriculture and fisheries. The Federal government and the visitor industry are the island's major sources of revenue. Manufacturing, agriculture and fisheries are still far from reaching a major level of development, but have significant potential for growth.

An assessment of the resources and constraints within each sector has provided the directions for growth as outlined in the various development programs found within the plan. In the economic role of the Federal government, the focus is toward reducing federal restrictions on both local and international commerce. Increasing the length and frequency of visitor stays is the dominant consideration in planning for growth of the visitor industry. The manufacturing sector

can capitalize on Guam's location and trading advantage with the U.S. mainland. Agriculture and fisheries can significantly reduce Guam's current reliance on imported food products.

A review of the state of the economy is discussed in Chapter I. This section includes other economic activities such as the construction industry, retail and wholesale trades, finance, insurance and real estate, transportation and communications and the service industry. The Economic Resources section of Chapter I outlines the financial, manpower and infrastructural capabilities of the economy to support the different economic activities. Chapter II presents the developmental strategies for the Federal government, the visitor industry, manufacturing, agriculture and fisheries.

I. OVERVIEW OF THE ECONOMY

The formulation of an economic plan for a developing territory requires an analysis of a wide range of relevant information. This chapter presents a background description of Guam's physical environment and its associated economic structure. The resources and constraints presented in this chapter together form the basis for development of specific goals, policies and recommendations.

A. The Area

Location and Size

A basic factor which has contributed to Guam's rapid economic growth is its geographic location. Guam is the southernmost and largest island in the Marianas chain in the Western Pacific, located at 13 degrees 28 minutes north, 144 degrees 45 minutes east, with a size of 32 miles long and 4 to 8½ miles wide. The total land area is 212 square miles.

Geographically, Guam is situated in close proximity to the Philippines, Japan, China, Korea, Commonwealth of the Northern Marianas, Trust Territory of the Pacific, and South-East Asia. Because of its location, Guam will continue to play an increasingly important role as a strategic military outpost.

Physical Environment

Guam's climate is tropical. Temperatures range from 70 to 90 degrees Fahrenheit, with an annual mean temperature of 81 degrees. Rainfall is abundant, averaging 105 inches a year, three-fourths of which fall during the rainy season between July and December. Tropical storms occasionally occur during the rainy season. January through May is the dry season, broken only by

occasional showers. Overall, the humidity averages 81 percent. Prevailing winds provide a pleasant tropical climate, the greatest asset of the tourist industry. The unique physical environment of Guam requires specialized architecture and concrete construction to cope with typhoons and earthquakes.

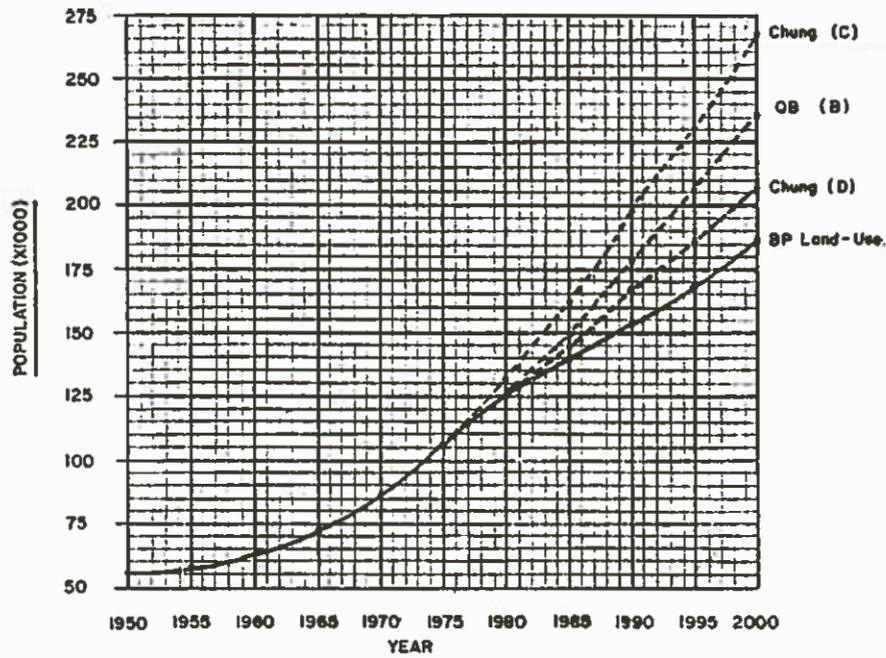
B. Population

In the past 15 years, the population has increased by more than 50 percent. As indicated in Figure I-1, various estimates of the population have been made. The rapid population growth is further complicated by the unpredictable immigration over which the community has no control. Guam faces the dilemma of trying to finance the infrastructure of tomorrow's doubled population with the income of today's population.

The median age of the civilian population is 18.9 years. More than 25 percent of the population is under 10 years old, and less than one-tenth is over 55 years old. The social and economic implications of this distribution are varied, and the community will soon face the unique problem of the rate at which the economy must absorb new workers. Such workers, over the next twenty years, will come from the age group 1-19. Presently, 52.3 percent of Guam's population is in the 1-19 age group. The national population has 35.6 percent in the same age group. Given the relative sizes of these age groups, Guam's economy must absorb new workers at more than 1.5 times the national rate.

C. Cost of Living

The price of consumer goods and services is increasing on Guam. The increases over previous years are 7.1 percent, 1.4 percent, and 5.3 percent in 1975, 1976, and 1977 respectively.



	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
Chung (D)	85,380 (63,380)	105,400 (83,400)	126,000 (104,000)	165,400 (143,400)	206,660 (183,660)
Quinton-Budlong (B)	89,890 (67,890)	106,310 (84,310)	126,956 (104,956)	179,352 (157,352)	236,000 (214,000)
Chung (C)	85,380 (63,380)	107,400 (85,400)	132,200 (110,200)	198,000 (176,000)	268,000 (246,660)
Bureau of Planning Land-Use		106,700 (84,700)			189,500 (167,500)

Note: Parentheses () indicate that the constant 22,000 military population is not included.

Figure I-1

GUAM POPULATION PROJECTIONS

Source: Land-Use Plan, Guam, 1977-2000, Bureau of Planning, Government of Guam.

Table I-1
ESTIMATES OF THE CIVILIAN POPULATION OF
GUAM, BY AGE AND CITIZENSHIP - SEPTEMBER 1975

Age	Total	Citizenship	
		U.S.	Permanent Resident Alien
All Ages	79,800	70,000	9,800
Under 5 yrs.	10,300	10,000	300
5 - 9 yrs.	10,600	9,800	800
10 - 14 yrs.	11,900	10,900	1,000
15 - 19 yrs.	8,900	8,100	800
20 - 24 yrs.	6,800	5,800	1,000
25 - 29 yrs.	6,000	4,700	1,400
30 - 34 yrs.	3,900	3,100	900
35 - 39 yrs.	4,000	3,100	900
40 - 44 yrs.	4,100	3,400	700
45 - 49 yrs.	4,100	3,600	500
50 - 54 yrs.	3,000	2,400	500
55 - 59 yrs.	2,200	1,800	400
60 - 64 yrs.	1,600	1,400	200
65 yrs and over	2,400	2,100	300
Median Age (yrs)	18.9	17.5	25.8

Source: Population Estimates of Guam: September 1975, Bureau of Labor Statistics, Department of Labor, Government of Guam.

Table I-2
CIVILIAN POPULATION, BY ETHNIC GROUP, *1975

Ethnicity	Number	Percent
Chamorro (Guamanian)	44,300	55.5
Filipino	15,400	19.3
Caucasian	7,200	9.0
Chamorro - Filipino	3,300	4.1
Chamorro - Caucasian	2,400	3.0
Chamorro - Other	1,400	1.8
Other Mixture	2,000	2.5
Micronesian	1,000	1.4
Japanese	900	1.1
Chinese and Korean	1,000	1.3
Other	800	1.0
Total	79,800	100.0%

*Excludes non-immigrant aliens and military dependents staying on military bases.

Source: Population Estimates of Guam: September 1975, Bureau of Labor Statistics, Department of Labor, Government of Guam.

Primarily, Guam's inflation is externally generated because most commodities are imported into Guam. The depreciation of the U.S. dollar in the international money market has increased the cost of goods imported from foreign sources. Inflation in the economies of Guam's major trading partners is expected to continue to increase during the next several years (6 percent or higher in the U.S.). Inflation on Guam is expected to be higher than in the United States because of the scheduled increase in construction labor wages. The doubling of construction wages will be felt in the housing market, in higher housing values and rents.

Table I-3
 GUAM CONSUMER PRICE INDEX
 (SEPTEMBER 1972 = 100)

	1974	1975	1976	1977
<u>All Items</u>	<u>130.0</u>	<u>139.2</u>	<u>141.1</u>	<u>148.6</u>
Food	141.3	152.2	157.3	163.8
Housing	126.9	132.4	131.7	141.3
Apparel & Upkeep	107.4	133.2	141.1	152.0
Transportation	131.2	139.6	140.6	148.7
Health & Rec.	121.0	127.7	128.3	132.2

Source: Cost of Living Office, Economic Research Center, Department of Commerce, Government of Guam.

D. Income and Wages

Personal and family incomes on Guam are substantially less than the United States average. In 1976, the mean family income totalled \$14,411 on Guam compared with \$16,870 in the U.S., or 17 percent more than on Guam.

A high proportion (11.3 percent) of families on Guam have an income of under \$3,000. Based on the poverty index for the U.S., developed by the Office of Economic Opportunity, about 25 percent of Guam's families with seven members or less were below the poverty level. The poverty index would exceed 30 percent if families with eight or more members were included.

Table I-4
FAMILIES ON GUAM BY MONEY INCOME LEVEL, 1976

Income Level	Number of Families ^{1/}	Per Cent
Under \$ 3,000	1,700	11.3
\$3,000- \$ 4,999	1,000	6.8
\$5,000- \$ 6,999	1,000	6.6
\$7,000- \$10,999	3,300	21.6
\$11,000-\$14,999	2,100	13.8
\$15,000-\$19,999	2,600	17.0
\$20,000-\$29,999	2,200	14.5
\$30,000-and over	1,300	8.4
Total	15,400	100.0
Median Family income ²	\$11,961	(\$14,958-U.S.)
Mean family income ²	\$14,411	(\$16,870-U.S.)

^{1/} Excludes non-resident alien families, and families living on military bases.

^{2/} Unweighted average.

Source: Bureau of Labor Statistics, Department of Labor, Government of Guam. Statistical Abstract of the U.S., 1977, U.S. Department of Commerce, Bureau of the Census.

Table I-5
PERSONAL INCOME ON GUAM: 1970-1974

Year	Total Personal Income (Millions)	Annual Percent Increase	Per Capita Personal Income	Annual Percent Increase	Total Tax-Related Population	Annual Percent Increase
1970	\$142.15	-	\$2,021	-	70,331	-
1971	166.21	16.9	2,300	13.8	72,261	2.7
1972	209.19	25.9	2,694	17.4	77,639	7.4
1973	273.99	31.0	3,185	18.2	86,025	10.8
1974	298.62	8.9	3,333	4.6	89,605	4.2

Source: Statistical Abstract 1976, Economic Research Center, Department of Commerce, Government of Guam.

As of January 1978, earnings in the private sector are lower than the U.S. by an average of 27.9 percent. In two sectors, construction and service, there is a more pronounced difference in hourly earnings. This can be attributed primarily to the extensive use of alien labor.

E. Private Sector

Construction

Construction has been a leading industry on Guam for years, from government rebuilding following World War II, to rehabilitation following Typhoon Karen, and to a tourist-related construction boom in 1973. The construction industry fell into its deepest recession in 1975. However, the prospects for construction in Guam are improving. In the aftermath of Typhoon Pamela in May 1976, the reconstruction of damaged military, public, and private facilities stimulated the industry. Residential construction was the major activity in this sector,

Table I-6
 EARNINGS OF PRODUCTION OR NONSUPERVISORY WORKERS ON
 PRIVATE PAYROLLS ON GUAM BY INDUSTRY DIVISIONS
 JANUARY 1978: (In Current Dollars)

Industry Division	Gross average hourly earnings	Gross average weekly earnings	Spendable average weekly earnings	
			Workers with three dependents	Workers with no dependent
Total Private	\$3.94	\$144.99	\$136.12	\$112.34
Agriculture	3.41	155.16	143.27	129.96
Total Non-Agriculture	3.95	145.36	136.38	122.62
Construction	3.56	162.34	148.88	135.34
Manufacturing	3.80	147.44	137.81	124.18
Transportation and Public Utilities	6.01	234.39	203.72	187.14
Trade	4.01	127.92	120.18	109.43
Finance, Insurance and Real Estate	3.74	145.49	136.47	122.71
Services	3.60	121.68	114.32	104.63

Source: Bureau of Labor Statistics, Department of Labor, Government of Guam.

comprising 57 percent of the total value of construction in FY 1977. As the consumer demand for construction decreased, the Government of Guam became the second major source of construction activity. The value of Government of Guam construction increased from \$349,000 in FY 1974 to \$17,820,000 in FY 1977.

Table I-7
SUMMARY OF POST-TYPHOON PROJECTS

Type of Project	Amount
Post-Typhoon Projects	
Military	\$122.0 million
Small Business Administration	48.8 million
Individual and Family Grant Program	8.1 million
Guam Public Schools	4.3 million
Guam Power Authority	4.8 million
Upgrading of Public Facilities	15.0 million

Source: Economic Research Center, Guam Department of Commerce.

The shortage of skilled workers on Guam has resulted in a predominance of alien labor in the construction industry. Available data indicates that, as of March 1977, 75.8 percent of the total 3,938 non-immigrant aliens were in the construction industry. These aliens constituted about 74.3 percent of total construction employment.

The high percentage of the non-immigrant aliens in the construction industry has far-reaching consequences. Alien wage rates depress the entire wage structure. The per hour wage rate in the construction industry is about 50 percent lower than in the U.S. mainland. However, it is still 3 to 4 times higher than the wage rates in the developing countries in Asia. The low wage rates have discouraged the entry of local residents into the construction industry and consequently

more non-immigrants enter the island. In FY 1976, an estimated \$60 million in U.S. contracts was spent on Guam. Approximately \$57 million of these construction contracts went to alien contractors. Much needed employment opportunities and income for local residents was lost. Additionally, a large portion of the alien worker's income is remitted to families in their homeland.

Transportation

It is imperative that Guam develop improved off-island transportation links. Most travellers to and from Guam utilize airline services. Pan American Airways inaugurated its first commercial flight between Japan and Guam in 1967. This significantly stimulated Guam's visitor industry. Accompanying the increasing number of the airlines serving Guam, the total number of flight landings at the Guam International Airport increased 154 percent between fiscal years 1967 and 1976. However, commercial aircraft landings decreased from 7,746 in FY 1975 to 5,522 in FY 1977. Discontinuance of Trans-World Airways (TWA) service to Guam accounted for most of this decrease.

A considerable portion of the products consumed on Guam are imported. Air revenue cargo tonnage increased 374 percent from FY 1967 to FY 1977. Sea transportation increased both in traffic and volume. Ship arrivals increased from 635 in FY 1975 to 744 in FY 1977.

In recent years, transshipment has become a significant activity. Total tonnage increased more than five times, from 31.0 thousand revenue tons in FY 1975 to 177.4 thousand revenue tons in FY 1977. Transshipment now accounts for 18.5 percent of the total surface cargo revenue.

Table I-8
 COMMERCIAL AIRCRAFT LANDINGS, GUAM INTERNATIONAL
 AIR TERMINAL: FY 1970-1977

Fiscal Year	Number of Landings
1970	3,651
1973	5,844
1974	7,366
1975	7,746
1976	5,119
1977	5,522

Source: Department of Commerce, Government of Guam, May, 1978.

Ground transportation on Guam has increased to the point where traffic during rush hours and rainy days is a problem. In the last decade, motor vehicles licensed on Guam more than doubled from 22,513 in FY 1967 to 57,779 in FY 1977. There is no public transportation system on Guam, passenger movement being confined to private vehicles, taxis, and tour buses.

Table I-9
 TOTAL SURFACE REVENUE CARGO: FY 1970-1977
 (In Thousands of Tons)

Fiscal Year	Unloaded	Loaded	Transshipped	Total
1970	406.7	70.1	8.7	485.5
1973	668.2	78.7	138.5	885.3
1974	669.8	84.3	104.2	858.3
1975	534.3	115.4	31.0	680.7
1976	441.4	120.9	127.7	690.0
1977	549.3	107.7	177.4	834.4

Source: Department of Commerce and Guam Port Authority, Government of Guam, May, 1978.

Retail and Wholesale Trades

In terms of payroll and gross receipts, the largest industry in the private sector is wholesaling and retailing. This industry accounted for 41 percent of gross receipts in FY 1976, with general merchandise stores contributing \$61 million and automotive dealers and gasoline service stations accounting for \$34.5 million. With the exception of a few modern shopping centers, most retail stores are family-owned businesses.

This industry accounted for one-third of the private sector employment, or 18.3 percent of all employment in January 1978, employing 6,100 people--more than the combined employment of agriculture, manufacturing, transportation, public utilities, finance, insurance, and real estate. This industry supplies the basic needs of the community and is primarily dependent upon household expenditures of the resident population and, to a lesser degree, on tourist expenditure.

Services

The service industry includes hotels, personal services, business, auto repair, amusement and recreation, health, legal, educational, and social services. Such services produce an average of 11 percent of Guam's total annual gross receipts. The gross business income decreased from \$75.5 million in FY 1974 to \$69.2 million in FY 1975, to \$66 million in FY 1976. The decline was caused by decreasing income in the hotel industry, causing a decline in revenue generated by associated business and support service. Over one-third of the gross business income in the service sector came from hotels.

The major percentage of people employed in this sector are employed in support of the tourist industry. Total visitor industry employment increased from 3,900 in June 1975 to 4,600 in January 1978, accounting for 13.8 percent of the total employment in the service industry.

Table I-10
 CONSOLIDATED GROSS BUSINESS RECEIPTS BY SECTOR: FY 1971-1976
 (In Thousands of Dollars)

Fiscal Year	Agriculture ¹	Contracting	Manufacturing	Transportation	Wholesale	Retail	Insurance			Total
							Real Estate	Finance	Service	
1971	-	69,458	39,833	148	40,232	107,885	24,607	41,228	323,391	
1972	-	86,269	41,390	213	46,514	162,375	34,568	51,764	432,093	
1973	207	112,117	44,378	5,735	59,573	168,744	51,381	56,922	499,056	
1974	655	126,237	99,534	14,812	42,633	196,336	65,117	75,485	620,810	
1975	1,043	105,339	117,114	14,182	42,290	188,154	70,362	69,220	607,704	
1976	944	64,036	151,758	12,872	44,636	202,099	60,354	65,749	602,448	

¹Prior to 1973, agriculture was not included in total gross receipts. Agriculture includes horticultural products only.

Source: Statistical Abstract, 1976, Department of Commerce, Government of Guam.

Finance, Insurance, and Real Estate

Most financial institutions on the island have developed rapidly. The increasing number of private business and alien business firms on Guam has attracted several major international banking institutions and other financial outlets. Guam has now become a finance headquarters for both American and alien business firms which operate in the Western Pacific region.

Demand deposits from all financial institutions increased from \$83 million in June 1976 to \$87 million in December 1977. However, during the same time period, total time and savings deposits dropped \$397.1 million, (from \$604.7 million to \$207.6 million in 1977). Until recently, banks on Guam were exempted from regulation "Q", which restricted the amount of interest paid on regular passbook savings and Time Certificate of Deposits (TCD's). The exemption stimulated the deposit of TCD's into Guam's national banks from off-island, especially from Puerto Rico, since interest earned on the deposit was exempt from taxes in Puerto Rico. However, the Tax Reform Act of 1976, effective January 1, 1977, removed this advantage and the total deposits in 1977 dropped from \$687.7 million in June 1976 to \$294.9 million in December 1977. The decrease in Time and Savings Deposits will not affect the economy of Guam, because a large portion of off-shore deposits has been customarily transferred to head offices of national banks.

Outstanding loans totalled \$291.7 million in December 1977, a decrease of \$12.7 million from the previous year. Over the past 4 years, conventional mortgage loans have been increasing in relative importance from 27.4 percent of the total outstanding loans in 1974 to 33.7 percent of the total loans in December 1977. Commercial installments decreased from 43.6 percent in 1974 to 34.9 percent in December 1977, as a result of the failure of the Federal Housing Administration (FHA) to insure residential mortgages since 1974. FHA also stalled in advancing construction-

related mortgage loans to reduce housing oversupply. Employment in the financial sector decreased from 1,300 in 1975 to 1,200 in January 1977.

F. Public Financial Resources

The Government of Guam currently maintains a number of funds, the most important of which is the General Fund. The General Fund is the largest of these funds, and provides for the ordinary operations of the Government of Guam.

Taxation is one of the principal resources of the General Fund. In FY 1977, income taxes constituted 44 percent of total General Fund revenue. Income taxes are assessed under the U.S. Internal Revenue Code. As shown in Table I-16, Guam's income tax collection has eroded in recent years. The decrease was basically the result of changes in the U.S. Income Tax Law, not in decreased income of taxpayers. Between FY 1974-FY 1976, the Government of Guam sustained income tax revenue losses amounting to \$15 million. However, a federal grant, authorized by the Omnibus Territories Act, provided reimbursement for the full amount.

Guam's gross receipts tax is a 4 percent levy on all business transactions involving goods and services on the island. Enacted by the Legislature in lieu of sales taxes, it accounts for roughly 20 percent of the territory's total tax receipts. Gross receipts tax collection has remained relatively stable in recent years, averaging at about \$22 million between FY 1973-FY 1977.

Real Property tax receipts were highest in FY 1974 at \$3 million. They dropped more than 400 percent in FY 1975 to \$.8 million because of changes in local tax laws, wherein the real property tax rate was reduced from 3 percent to $\frac{1}{2}$ percent on land and 1 percent on improvements. The tax rate is based on 35 percent of the real property appraised value. The assessment of real property conducted every three years was completed in FY 1977.

Table I-11
 SOURCES OF GENERAL FUND REVENUES: FY 1973-1977
 (In Thousands of Dollars)

	1973	1974	1975	1976	1977
Taxes					
Income	\$57,923	\$ 66,032	\$ 68,027	\$ 53,157	\$ 51,444
Gross Receipts	19,526	22,953	23,652	20,489	23,072
Real Property	2,820	3,087	763	1,956	2,568
Other Taxes	1,163	1,420	1,476	1,272	2,776
Charges, Fees, Fines, Etc.	4,630	7,463	8,561	7,300	3,839
Local Revenues	86,035	100,955	102,479	84,173	83,701
Federal Grants	10,630	11,508	14,743	21,027	33,758
Total Revenues	\$96,665	\$112,463	\$117,222	\$105,200	\$117,459

Source: Annual Audit Report of GovGuam Financial Statements: FY 1973-FY 1977.

Based on new property values, real property tax collection for FY 1978 was estimated to increase by approximately \$2.5 million. However, the Legislature postponed the imposition of the new taxable values until FY 1979.

Other sources of General Fund revenue include: Licenses and Permits, Fines and Forfeitures, Interest, Rentals, Immigration Fees, and charges for government services. Combined, they represent about 3 percent of total General Fund revenue. Federal grants, which constituted roughly one-third of the General Fund revenues in recent years, have become increasingly important in financing of governmental operations.

Although federal grants have been growing steadily the last few years, grants are subject to change according to the priorities established by the United States government.

General Fund expenditures and encumbrances were kept in alignment with revenues until FY 1975, the start of the recession. Since then, government operations have been severely constrained. The combined effects of worldwide economic recession, Supertyphoon Pamela, a decline in tourism, and the slowdown of military activities, resulted in a significant reduction of General Fund revenues. Despite the government's austerity program, outlays exceeded revenue.

Table I- 12
SUMMARY OF GENERAL FUND OPERATIONS: FY 1973-1977
(In Thousands of Dollars)

	1973	1974	1975	1976	1977
Revenues	96,665	112,463	117,222	105,200	117,459
Expenditures and Encumbrances	80,135	96,563	134,642	116,532	129,695
Surplus (Deficit)	16,530	15,900	(17,420)	(11,332)	(12,236)

Source: Annual Audit Report of GovGuam Financial Statement: FY 1973-FY 1977.

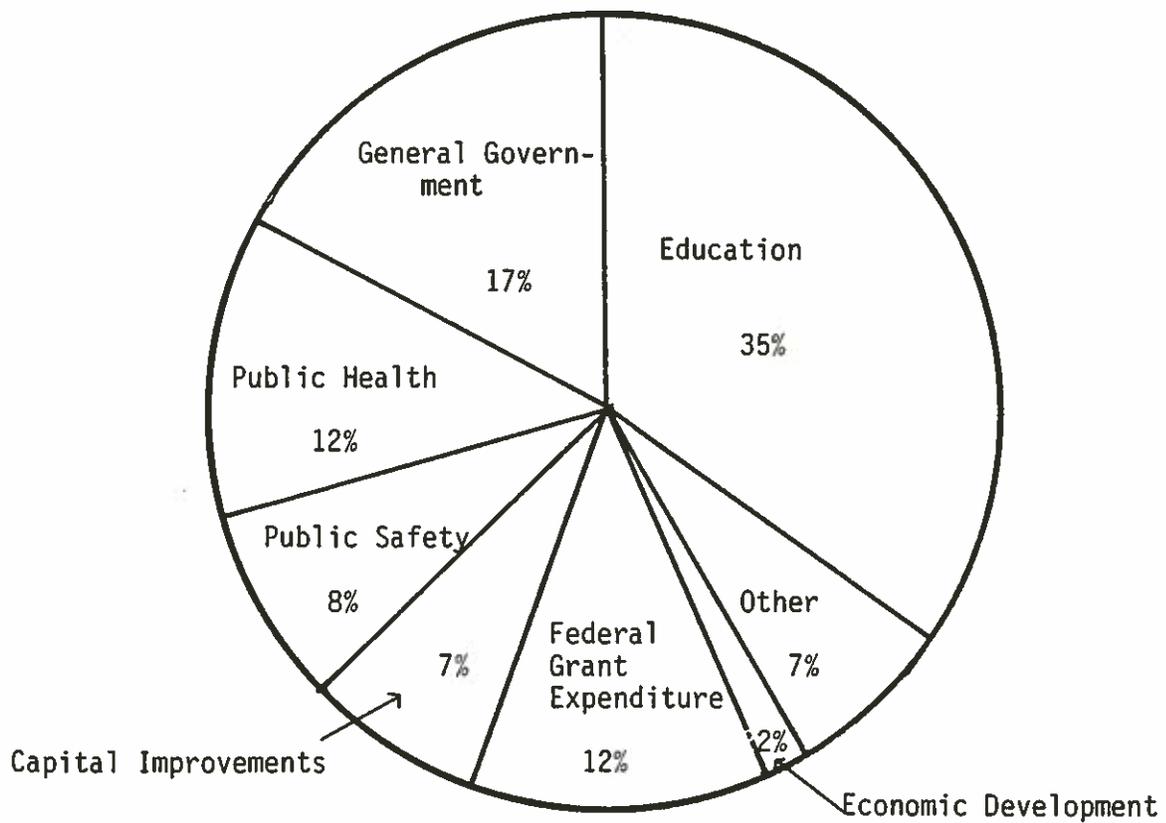


Figure I-2
 GENERAL FUND EXPENDITURES: FY 1977

Source: Financial Statements and Schedule of Government of Guam,
 June 30, 1977.

Table I-13
 CUMULATIVE GAIN (LOSS) AND GOVGUAM
 SUBSIDY TO AUTONOMOUS AGENCIES BY END OF FY 1977
 (In Thousands of Dollars)

Agency or Fund	Cumulative Gain or (Loss)	Cumulative GovGuam Subsidy
Commercial Port	(\$14,035)	\$14,381
Guam Economic Development Authority	(781)	1,094
Guam Housing Corporation	2,263	5,296
Guam Housing and Urban Renewal Authority ^{1/}	(1,542)	5,064
Guam International Air Terminal	4,521	1,334
Guam Rental Corporation	(65)	None
Guam Telephone Authority	(640)	13,206
Public Utility Agency of Guam	(20,978)	31,084
University Auxiliary Services Fund ^{1/}	(18)	24
University Dormitory Revenue Fund ^{1/}	(171)	720
Guam Power Authority ^{2/}	2,264	2,045
Guam Memorial Hospital ^{1/}	(29,672)	34,458
Total	(\$58,854)	\$108,706

^{1/} As of end of FY 1976.

^{2/} As of end of FY 1975.

Source: Annual Audit Report of GovGuam Financial Statement: FY 1977.
 Federal Comptroller's Report to Congress, September 1977.

Autonomous agencies affect the General Fund to the extent of the subsidies they require. Between FY 1970 and FY 1977, losses encountered by these autonomous agencies were estimated at \$50 million. By the end of FY 1977, at least \$100 million in General Fund subsidies have been made to these agencies. Most of these public enterprises were established to be self-sustaining, however, only one (the Guam Airport Authority) out of eleven agencies, has operated without substantial assistance from the General Fund. Subsidies made to these agencies have significantly contributed to the current deficit situation.

G. Infrastructure

Commercial Port

When the Port facilities at Cabras Island were planned in 1967, no one envisioned the tremendous growth which would occur on Guam during the next decade. At its inception, the new facilities were designed and constructed to service one containerized cargo carrier and a small number of breakbulk vessels. Within five years, a dramatic change occurred and the Port was serving three container carriers and the same number of conventional vessels. The Port is now handling 50,000 containers per year. The space problems are so severe that even sophisticated container stacking equipment cannot provide relief and the container carriers have been forced to lease land from the U.S. Navy to overcome the lack of storage and handling space. Presently, the Port's facilities are located on 33 acres of land, and include 2700' of dock space, two warehouses, administration building, two transit sheds, nine-acre container and marshalling yard, one gantry crane on an 1100' track. A new gantry crane should be in operation in October, 1978. These inadequate facilities must be expanded to include a larger container yard covering approximately 20 acres, security fencing, storm drainage, and a lighting system. The expansion must also include construction

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of a control tower, relocation of the present road to the northern coast of Cabras Island and erection of additional warehousing at an estimated cost of \$6 million.

Airport

Guam International Air Terminal (GIAT) has become a major center of air transportation in the Pacific. During the past 10 years, Guam has become one of the principal U.S. gateways to Eastern Asia and a tourist destination point. The original GIAT constructed in 1967, was inadequate to meet the growth demands of the travel industry even on the day of the airport's opening. In 1976 and 1977 improvements at the terminal included an expanded and remodelled arrival building, a new departure transit lounge, an open air weather protected spectator deck, new restrooms, an improved screening security booth, an expanded customs booth, two continuously cycling baggage conveyors, and consolidation of airline cargo operations into a single facility.

Improved traffic flow for better airport operations including the construction of a traffic loop for one-way traffic in the terminal area, relocation of the access road and extension of the existing parking lot areas has been recently accomplished. The Naval Air Station security gate was also relocated. A new air terminal building is planned for construction in the early 1980's.

Highways

Originally built by and for the military, the highway system is now inadequate to serve growing transportation needs. The overtaxed roads are expected to be incapable of handling the forecasted traffic volumes for 1987-1990. In order to address these problems, the Department of Public Works Planning Division in

cooperation with the U.S. Department of Transportation has been working on upgrading existing highways and bridges.

Highway construction and improvements are recommended for agricultural, industrial, and tourism purposes. San Vitores Road, the central route through the Tumon Resort Zone, has been redesigned and construction will soon be initiated. The design of several bridges, such as those crossing the Talofofu, Pago, Umatac, Sasa and Agueda rivers has started. The design plans for the Agfayan and As Linguit River bridges have been completed and should be ready for construction. Roads located in Pagachao and Pigua subdivisions have been completed, while the reconstruction of Route 1 is continuing.

Table I-14
CLASSIFICATION OF GUAM'S HIGHWAY SYSTEM BY LANES AND TYPES, 1977

Lanes	Miles	Type	Miles
2 lanes	229.71	Trunk Highway	38.01
3 lanes	10.62	Major Highway	17.60
4 lanes	15.03	Minor Highway	55.70
Over 4 lanes	0.85	Collector Road	24.05
		Local Street	120.85
Total	256.21	Total	256.21

Source: Highway Division, Department of Public Works, Government of Guam.

Electrical Power

Established in 1969, the Guam Power Authority (GPA) was given the responsibility of distributing Navy generated power to the civilian population. Today, the island's

power system consists of the Cabras and Tanguisson No. 2 plants (owned and operated by GPA) and the Tanguisson No. 1 plant (owned by the U.S. Navy and operated by GPA). On reserve standby capacity is the Piti Plant, the Inductance Power Barge and GPA diesels. Altogether, the power system has the capacity to produce 302 megawatts (MW). In FY 1977, over a billion wattage hours of electricity were produced.

Table I-15
ISLANDWIDE POWER SYSTEM
1970-1977

Calendar Year	Installed Capacity (MW)	Electricity Production (10 ⁶ KWH)
1970	127	805
1973	228	1,005
1974	259	1,008
1975	302	1,046
1976	302	980
1977	302	1,058

Source: Guam Power Authority, Government of Guam.

Damage to power plant facilities by Typhoon Pamela in May 1976 amounted to \$5.98 million. By November of that year, the power system was restored to pre-typhoon condition. The recently completed two 268,000 barrel fuel oil storage tanks, adjacent to the Piti Power Plant, will enable GPA to store an ample fuel oil reserve. The current Power Pole Hardening Project involves the installation of concrete poles serving hospital circuits, waterwells, transmission lines, and subtransmission lines. Cabras Island will be the site for future power production facilities. Assuming present load growth, a new 87 MW plant will be needed in 1990. The existing Government of Guam land on Cabras Island is sufficient for this purpose.

Communications

The quality of telephone service on Guam deteriorated after Typhoon Pamela in May 1976 with almost total destruction of outside telephone facilities. The Guam Telephone Authority (GTA) is engaged in a major reconstruction program designed to provide high quality telephone service by mid-1979.

Table I- 16
A SUMMARY OF SUBSCRIBERS AND REVENUE OF GUAM
TELEPHONE SYSTEM: FY 1970-1977

Fiscal Year	Subscribers	Revenue
1970	6,785	\$ 798,000
1973	9,816	1,341,000
1974	11,795	4,101,000
1975	12,420	4,978,000
1976	11,449	4,895,000
1977	11,815	4,728,000

Source: Guam Telephone Authority, Government of Guam.

Due to inadequate distribution and switching facilities, GTA is presently serving 50 percent of the estimated total telephone market on Guam. When the new facilities are in operation, the number of subscribers should increase to 25,000. Direct dialing to areas throughout the world is possible, due to the implementation of a new system by RCA Global Communications, Inc.

Financing of the reconstruction program has been completed with the U.S. Department of Agriculture, Rural Electrification Administration. Loans totalling \$27,449,000 have been approved at a 5 percent interest rate with repayment over a period of 35 years.

Water

Guam's water supply is secured from both ground and surface water sources, and in 1977 a total of 10.51 billion gallons of water was produced. Surface water

sources, primarily from the Fena Reservoir, serve Navy installations and some civilian residents in Agat and Santa Rita. Groundwater source is provided by the Government of Guam, which currently operates 65 wells located on the northern limestone plateau. The Air Force pumps its water from eight deep wells and from the Tumon Shaft. At the present time, the water system is partially integrated. The dependable maximum yield of islandwide water resources has been estimated at 50 mgd (million gallons per day) for groundwater sources and 17 mgd for surfacewater sources.

Saltwater intrusion and wastewater pollution are major threats to the water system. Close monitoring of land-use activities is necessary to protect the underground lens system. In order to ensure that adequate potable water is available in the future, the Government of Guam must reduce water loss by repairing waterline leakage and eliminating illegal water tapping.

Table I- 17
 WATER PRODUCTION AND SUPPLY RESOURCES: 1977
 (In Billions of Gallons)

Production		Supply Resources	
Government of Guam	5.56	Groundwater	6.73
Air Force	1.26	Springs	0.94
Navy	3.50	Surface	2.85
Private	0.19		
Total	10.51	Total	10.51

Source: Guam Environmental Protection Agency, Government of Guam.

In the south, dams and other water facilities which can tap the supply of surfacewater may be constructed to provide supplemental water for commercial, industrial, and agricultural uses. The long-range surfacewater development program includes the possible construction of four water reservoirs in Southern Guam. The potential of the proposed Ugum River Reservoir is currently being studied by the Army Corps of Engineers.

Table I- 18
 WATER CONSUMPTION: FY 1970-1977
 (In Millions of Gallons)

Fiscal Year	Residential	Commercial and Government	Total
1970	1,371	1,214	2,585
1973	2,279	1,042	3,321
1974	2,481	1,114	3,595
1975	2,571	1,476	4,047
1976	2,726	1,468	4,194
1977	2,696	1,545	4,241

Source: Statistical Abstract, Department of Commerce and Public Utilities Agency of Guam, Government of Guam.

H. Manpower Resources

Guam's continued growth and development requires a strong manpower resources program. Guam often finds itself in the paradoxical position of having increasing unemployment levels and at the same time experiencing shortages in various occupational categories. Manpower supply must balance with manpower needs.

Labor Force

As a consequence of population growth, the size of the civilian labor force has expanded from 22,496 in 1970 to 28,420 in December 1977. Labor force participation among women has been increasing rapidly for many years, particularly in the

25-34 age group. Female labor force participation in this age group increased from 38.5 percent in 1970 to 61.9 percent in 1977. The need to supplement the family's income due to the high cost of living and a high level of educational attainment have increased labor participation among women, an increase projected to continue.

Table I-19
CIVILIAN LABOR FORCE PERCENT OF POPULATION
16 YEARS AND OVER, BY SEX

Sex	May '75	May '76	Mar. '77
Both sexes	63.8	59.0	60.2
Male	78.2	74.8	75.2
Female	49.7	44.1	46.0

Source: Current Labor Force Surveys, Bureau of Labor Statistics, Department of Labor, Government of Guam.

Employment

Employment growth reached a peak in the early 70's and has declined since 1975, due to the world economic recession. However, there has been recent improvement. As of December 1977, total employment was 26,460. Although employment increases were visible among all major age groups, relative gains were greater for teenagers than for adult men and women. Over 14 percent of the employed labor force are immigrant aliens and 85.6 percent are U.S. citizens.

The employment situation on Guam is also illustrated in Table I-21 which depicts employees on payrolls by industry. The labor absorption in various sectors has shifted as a result of changes in Guam's economy. The construction sector which

Table I-20
HIGHLIGHTS OF THE EMPLOYMENT AND UNEMPLOYMENT SITUATION ON GUAM

	9/75	9/76	12/77
Civilian labor force	28,090	26,910	28,420
Total employment	25,390	24,600	26,460
Adult men	15,210	14,410	15,520
Adult women	8,790	8,800	9,340
Teenagers	1,390	1,380	1,590
Full-time workers	*	21,860	24,130
Part-time workers	*	2,750	2,220
U.S. citizens	*	19,390	22,640
Immigrant aliens	*	5,210	3,800
Total unemployment	2,700	2,320	1,960

Percent of Labor Force

Unemployment rates			
All workers	9.6	8.6	6.9
Adult men	4.9	6.0	3.4
Adult women	9.8	8.6	8.2
Teenagers	40.6	28.8	26.6
Household heads	3.2	4.7	6.3
Full-time workers	8.1	7.7	5.7
Part-time workers	22.0	15.0	18.6
U.S. citizens	9.4	8.7	7.2
Immigrant aliens	10.4	8.2	5.4
Veterans	5.2	5.6	2.2
 Average duration of unemployment (weeks)	 6.7	 7.1	 11.5

* Data not available.

Note: Sum of individual items may not equal totals due to rounding. Data on unemployment and labor force does not include non-immigrant aliens.

Source: Bureau of Labor Statistics, Department of Labor, Government of Guam.

was the greatest contributor to total employment declined from 22 percent to 12.7 percent and the number of employed decreased from 8,200 to 3,800 in the period of 1973 - February 1978. During the same period, the growth of the service sector increased from 11 percent to 13.6 percent or an increase in the number employed from 4,100 to 4,600. Rapid growth was evident in the trade sector, where total employment increased from 14 percent to 18.3 percent, and the number of employees increased from 5,500 to 6,200, 32.6 percent of the total employees on private payrolls.

Manpower Development Program

Appendix A provides a summary of occupational training and education available on Guam. These programs are made possible through both federal and local funding. The available manpower programs, descriptions, funding levels and number of participants are listed.

Table I-22 is the labor supply projection by occupation in 1982. The projection is estimated by the Division of Careers and Occupation, Department of Education, based on the 1977 enrollment at Guam Community Career College, public secondary schools, and other manpower programs.

Table I-21
EMPLOYEES ON PAYROLLS ON GUAM, BY INDUSTRY 1971-1977

INDUSTRY DIVISION	NUMBER (In Thousands)						
	71 Sept.	72 Sept.	73 Sept.	74 Sept.	75 Sept.	76 Sept.	77 Sept.
Total	<u>26.8</u>	<u>30.4</u>	<u>38.0</u>	<u>37.0</u>	<u>33.8</u>	<u>29.5</u>	<u>32.6</u>
Total Private	<u>14.3</u>	<u>17.0</u>	<u>22.6</u>	<u>21.1</u>	<u>18.4</u>	<u>15.6</u>	<u>18.0</u>
Agriculture	*	*	0.1	0.1	0.1	0.1	0.1
Construction	5.5	7.1	8.2	7.3	4.2	3.0	3.8
Manufacturing	1.1	1.0	1.6	1.5	1.1	0.8	0.9
Transportation	0.9	0.8	1.7	1.6	1.6	1.5	1.6
Trade	3.5	4.6	5.5	5.2	6.1	5.3	5.8
Finance, Insurance and Real Estate	0.8	0.6	1.4	1.3	1.3	1.2	1.3
Services	2.5	2.8	4.1	4.1	4.1	3.7	4.5
Public Sector	<u>12.5</u>	<u>13.4</u>	<u>15.4</u>	<u>15.9</u>	<u>15.9</u>	<u>13.9</u>	<u>14.6</u>
Federal	5.9	6.1	7.4	7.2	6.2	6.4	6.5
Territorial	6.6	7.3	8.0	8.7	9.2	7.5	8.1

* Less than 100

Source: Bureau of Labor Statistics, Department of Labor, Government of Guam.

Table I-22
PROJECTED LABOR SUPPLY
1982

<u>Occupation</u>	<u>Number of Individuals</u>
Agriculture	30
Food and Other Products Distribution	22
Retail Sales	20
Hotel Services	35
Health Services	40
Police Science	50
Accounting and Computer Services	119
Secretarial Services	130
Construction	86
Civil Engineering and Surveying	24
Drafting and Graphic Arts	33
Electrical Services	150
Plumbing	7
Welding	55
Small Engine Services	10
Machinery Services	9
Carpentry	100
Radio and Television Services	15
Vehicle Repair and Service	120
Appliance Services	51
 Total	 1,106

Source: Five-Year and Annual State Plan for Vocational Education, Division of Careers and Occupation, Department of Education, and Bureau of Planning, Government of Guam, 1977.

II. DEVELOPMENTAL STRATEGIES

This chapter focuses on those sectors which offer the best potential for generating new jobs and greater income for the Territory of Guam. These sectors are: Federal Government, tourism, industry, agriculture and fisheries. The development strategies identify the basic programs, projects and policies that would stimulate the growth of these sectors.

These strategies provide a framework for carrying out more detailed planning and implementation. In most cases, sectoral plans are completed or are nearing completion and implementation can begin. Some program elements however, need to be better defined, which can best be accomplished by those agencies responsible for implementation. Planning is a continuing process and the strategies recommended will need to be constantly updated in light of new information and changing conditions.

A. Federal Government

From 1898 to the present, the U.S. Federal government has played a major role in the administration, planning, and control of the island's economy. Historically, Guam was administered by the U.S. Navy until 1950 when the administration was transferred to a civilian government. This change created an ambiguous situation in which the respective responsibilities of economic planning and development programs within the Department of Interior, U.S. Navy, U.S. Congress, and the Government of Guam were not clarified. A lack of federal comprehensive planning in the Western Pacific has isolated Guam's economy and hindered the development of regional commerce.

Economic Impact

Guam is still highly dependent on the Federal government - the single largest source of revenue coming into the territory. The local economy benefits from the presence of the Federal government in several ways.

In FY 1977, federal outlays on Guam amounted to \$468 million, a two-fold increase over FY 1972. These funds came in the form of federal agency expenditures, loans, and grants to the public and private sectors. Military expenditures claim a major portion of the federal outlay.

From September 1970 to September 1977, the Federal government employed an average of 20.8 percent of Guam's total labor force. Federal employees work for 20 different Federal agencies.

Table II-1
 FEDERAL OUTLAYS ON GUAM: FY 1972-1977
 (In Thousands of Dollars)

Fiscal Year	Department of Defense	Other U.S. Agencies	Total Federal Outlays
1972	126,496	31,722	158,218
1973	228,723	32,927	261,650
1974	201,500	30,498	231,998
1975	225,961	43,069	299,030
1976	295,032	57,152	352,184
1977	369,193	98,553	467,746

Source: Federal Outlays in Territories and Other Areas Administered by the U.S., Office of Economic Opportunity, FY 1972 - FY 1977.

The Federal government rents approximately 40,000 square feet of office space, at an estimated rental fee of over half a million dollars per year, contributing substantially to rental gross receipt income.

Table II-2
 FEDERAL EMPLOYMENT ON GUAM

Date	Total Employment (000)	Total Federal Employment (000)	Percent of Total Workers In Federal Employment	Percent of Public Workers In Federal Employment
1970	25.4	6.7	26.4	54.9
1971	26.8	5.9	22.1	47.3
1972	30.4	6.1	20.0	45.6
1973	38.0	7.4	19.5	40.5
1974	37.0	7.2	19.5	43.0
1975	33.8	6.2	18.3	47.0
1976	29.5	6.4	21.7	47.1
1977	32.6	6.5	19.9	44.8

Source: Economic Adjustment Program for the Territory of Guam, Office of the Economic Adjustment, Washington, D.C., July 1977, p. 3-3, and Bureau of Labor Statistics, Department of Labor, Government of Guam.

The Federal government's involvement with the construction of Guam's infrastructure dates back to post World War II days. The Commander, Naval Forces Marianas requested \$15 million from the U.S. Congress to rebuild Guam from the ruins of World War II. The U.S. Congress granted only \$6 million, which was used to fund construction of 18 projects, including the construction of the Legislature building, Government House, several schools, police headquarters and 40 percent of the streets, sidewalks and other utilities. Vital facilities such as hospital, power, water and telephone facilities were not covered by these funds.

Nearly twenty years after the war, Guam faced the need for substantial rehabilitation because of Typhoon Karen and Typhoon Olive. In response to these reconstruction needs, the U.S. Congress passed the Guam Rehabilitation Act of 1963 which authorized \$45 million to rebuild public works and community facilities. In 1968, another \$30 million was authorized to augment the original rehabilitation fund. These funds were expended for the construction of schools, port facilities, a small air terminal, medical centers, village facilities, a penitentiary, public works, administration buildings, limited sewer and water facilities, and a small power station. Since then, Guam has continued to receive Federal assistance for various capital improvement projects. Major sources of Federal grants for capital improvements are the Department of Housing and Urban Development (HUD), the Department of Health, Education and Welfare (HEW), the Environmental Protection Agency (EPA), the Army Corps of Engineers, the U.S. Department of Interior, the Economic Development Administration (EDA) and the Federal Highway Administration. These Federal agencies are responsible for funding the construction of infrastructure, educational, and recreational facilities.

The Military

The excellent deep draft harbor, airfields within range of Asia, and geographic location as a vital link in global military radio communication give Guam its strategic value. Recognizing this, the U.S. has maintained a strong military presence on the island.

Substantial waterfront and airfield facilities on Guam are capable of supporting 40 home-ported ships and 3 air squadrons. The Naval installations include Naval Magazine, a major weather station, supply station, major storage of bulk fuel, a ship repair facility, and a large communications center. These facilities support the Seventh Fleet. On Guam, there is also a nuclear submarine base, a Naval Air Station, hospital, Seabee camp, and a public works center.

Housing and community support facilities are provided for the military population. Community support facilities such as military base exchanges and commissaries provide a wide selection of goods. These military outlets discourage private sector activity.

Federal expenditures on the island are primarily for defense purposes. An average of 82 percent of total federal outlay is for the Department of Defense (DOD). This budget for the military filters into the economy in various ways. Of the total DOD outlays, approximately 16 percent is allocated for civilian salaries. This accounted for \$60 million in FY 1977.

A more direct contribution to the local economy is in the form of income taxes received by the Government of Guam from military personnel. Section 30 of

Table II-3
 DEPARTMENT OF DEFENSE OUTLAY ON GUAM: FY 1973-1977
 (In Thousands of Dollars)

Outlays By Category	1973	1974	1975	1976	1977
Civilian Pay	\$ 52,001	\$ 50,372	\$ 60,415	\$ 60,568	\$ 60,067
Military Pay					
Active Duty	111,321	54,151	51,435	77,247	76,917
Retired	1,805	2,175	2,753	3,234	3,545
Reserve and National Guard			79	90	84
Military Prime Contracts					
Supply (including petroleum)	36,139	58,931	112,533	121,269	121,862
Service	4,359	3,439	4,735	3,640	21,788
Construction	16,344	28,954	12,726	22,927	79,360
Civil Functions Prime Contracts		78	6,600	657	285
Prime Contracts of Less Than \$10,000	6,754	3,400	4,685	5,330	5,247
Other Outlays				70	38
Total	228,723	201,500	255,961	295,032	369,193

Source: Geographic Distribution of Federal Funds in Territories and Other Areas Administered by the U.S. Compiled for the Executive Office of the President, by the Community Services Administration.

the Organic Act requires that income taxes, withheld from the payroll of military personnel assigned to or stationed on ships of the U.S. Navy berthed on Guam (such as the USS Proteus), be returned to the Treasury of Guam. Section 30 funds amounted to \$18 million in FY 1977.

The military is a major client of the construction industry. Military construction on the island averaged \$16 million from fiscal years 1967 through 1976. In the last ten years, military construction accounted for an average of 23.2 percent of the total gross receipts in the construction sector. The proportion of military construction to total construction receipts increased thirty-fold between fiscal years 1967 and 1976. This proportion is expected to increase further as post-typhoon Pamela reconstruction continues. Approximately \$139 million in Naval military construction will be expended for new facilities and projects associated with rebuilding facilities damaged during Typhoon Pamela.

The military purchases local produce such as eggs, pastries, milk, and utilizes services such as child care, department stores, restaurants, automotive repair, etc. An estimated 700 locally-owned housing units, with monthly rental fees ranging from \$125 to \$350 per month are currently rented by military personnel.

Table II-4
NUMBER OF GRADUATES,
U.S. NAVAL APPRENTICE PROGRAM: 1967-1977

Year	Public Works. Center	Ship Repair Facility	Total
1967	4	6	10
1968	8	14	22
1969	28	29	57
1970	16	21	37
1971	33	104	137
1972	2	5	7
1973	15	61	76
1974	15	48	63
1975	18	34	52
1976	2	0	2
1977	5	2	7

Source: Consolidated Industrial Relations Office (CIRO), U.S. Navy, Guam.

As a matter of policy, the military aids in the development of human resources. The U.S. Navy Ship Repair Facility (SRF) reimplemanted an apprenticeship program in October 1976. This program plays two important roles in the local economy. First, the apprenticeship program opened jobs for the local labor force. There were approximately 800 civilian employees with SRF as of October 1977, over 90 percent of whom were local residents. Secondly, an effective apprenticeship program helps improve the skill of the local labor force in carpentry, welding, electronics, pipe fitting, and other occupational specialties.

Federal Landholdings

The Federal government owns over 44 thousand acres of land on Guam. The DOD controls 95.8 percent of this land. The Air Force is concentrated in the northern region, while Naval installations are located in northern, southern and central Guam. Federal land ownership represents one-third of Guam's land area. This ratio is deemed excessive in view of the island's limited resources. The Department of Defense recently released a military land-use plan. The plan proposes the release of 2,625 acres of land and acquisition of 900 acres in fee simple and 1,285 in restrictive easements. However, implementation of the plan would prove difficult due to the aspirations of private owners of lands sought for acquisition by the military.

There are two major federal land areas that affect the economic development of the island: Apra Harbor, and the Naval Air Station. Apra Harbor consists of Cabras Island, Dry Dock Island and Orote Point. The Navy occupies these areas with the exception of the eastern and western ends of Cabras Island. The trend in commercial activities involves an increasing dependence on the Commercial Port. The

Table II-5
PATTERNS OF FEDERAL LAND OWNERSHIP, 1976

<u>Agency</u>	<u>Acres</u>	<u>Percent</u>	<u>Percentage of Total Land Area</u> ^{1/}
A. Military			
Air Force	20,544.54	46.1	15.1
Navy	22,069.24	49.5	16.3
Coast Guard	71.99	0.2	0.05
Subtotal:	42,685.77	95.8	31.45
B. Non-Military (Federal)			
Federal Aviation Administration	833.18	1.9	0.6
Department of Interior	988.66	2.3	0.7
Subtotal:	1,821.84	4.2	1.3
Grand Total (A&B) ^{2/}	44,507.61	100.0	32.75

Footnote:

^{1/} Assuming total acreage of approximately 212 square miles x 640 acres per square miles.

^{2/} Differences in conversion factors used account for approximately 5 percent error in acre/square meter comparison. Total areas do not include submerged lands adjacent to property owned by the U.S.

Source: A Summary of Major Federal Agency Land Holdings of the Territory of Guam, Bureau of Planning, Government of Guam, January 1977, p. 3.

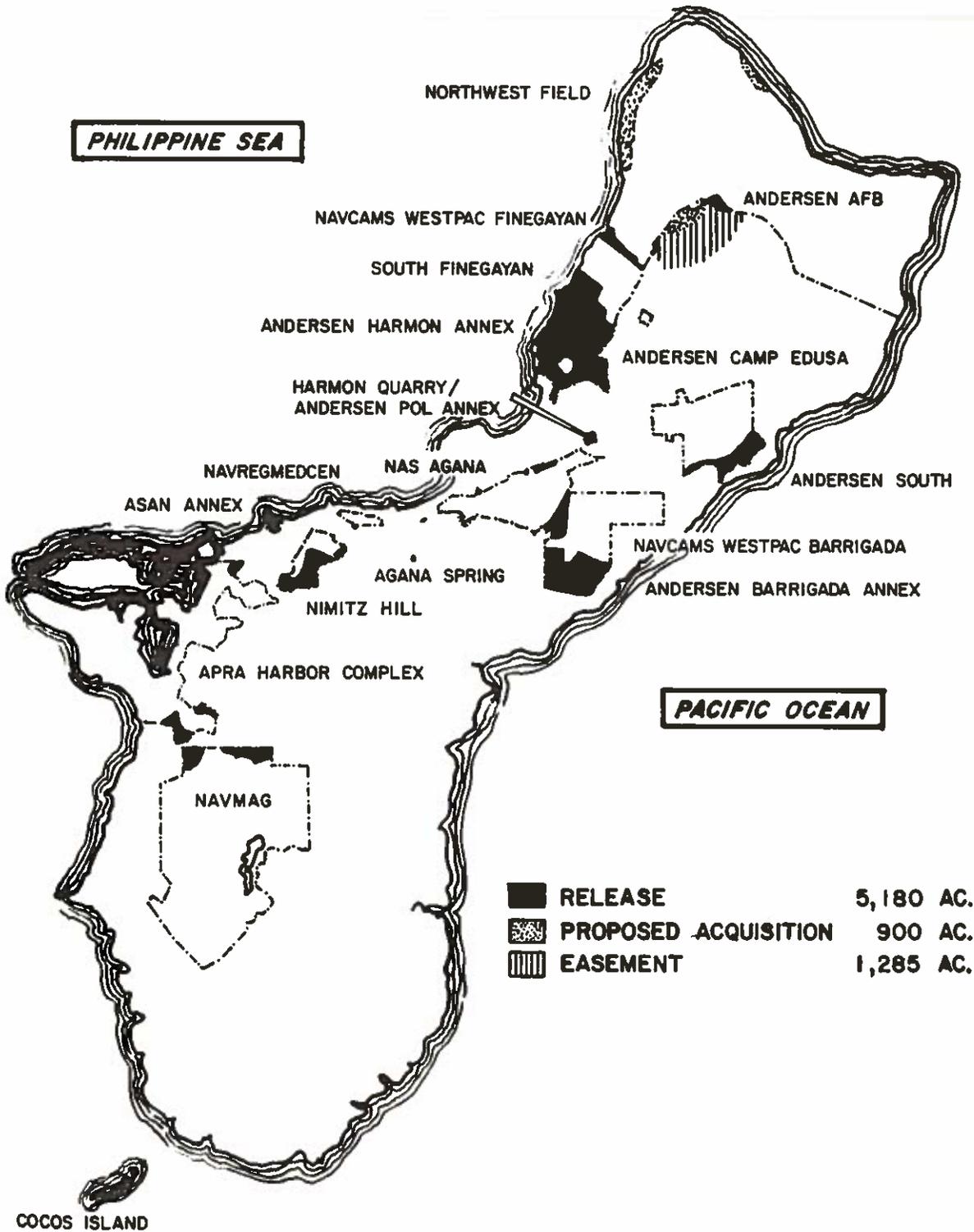


FIGURE II-1
RELEASABLE AREA / LAND ACQUISITION
ISLAND OF GUAM

SOURCE : GUAM LAND USE PLAN, DEPARTMENT OF THE NAVY, PACIFIC DIVISION, SEPT. 1977

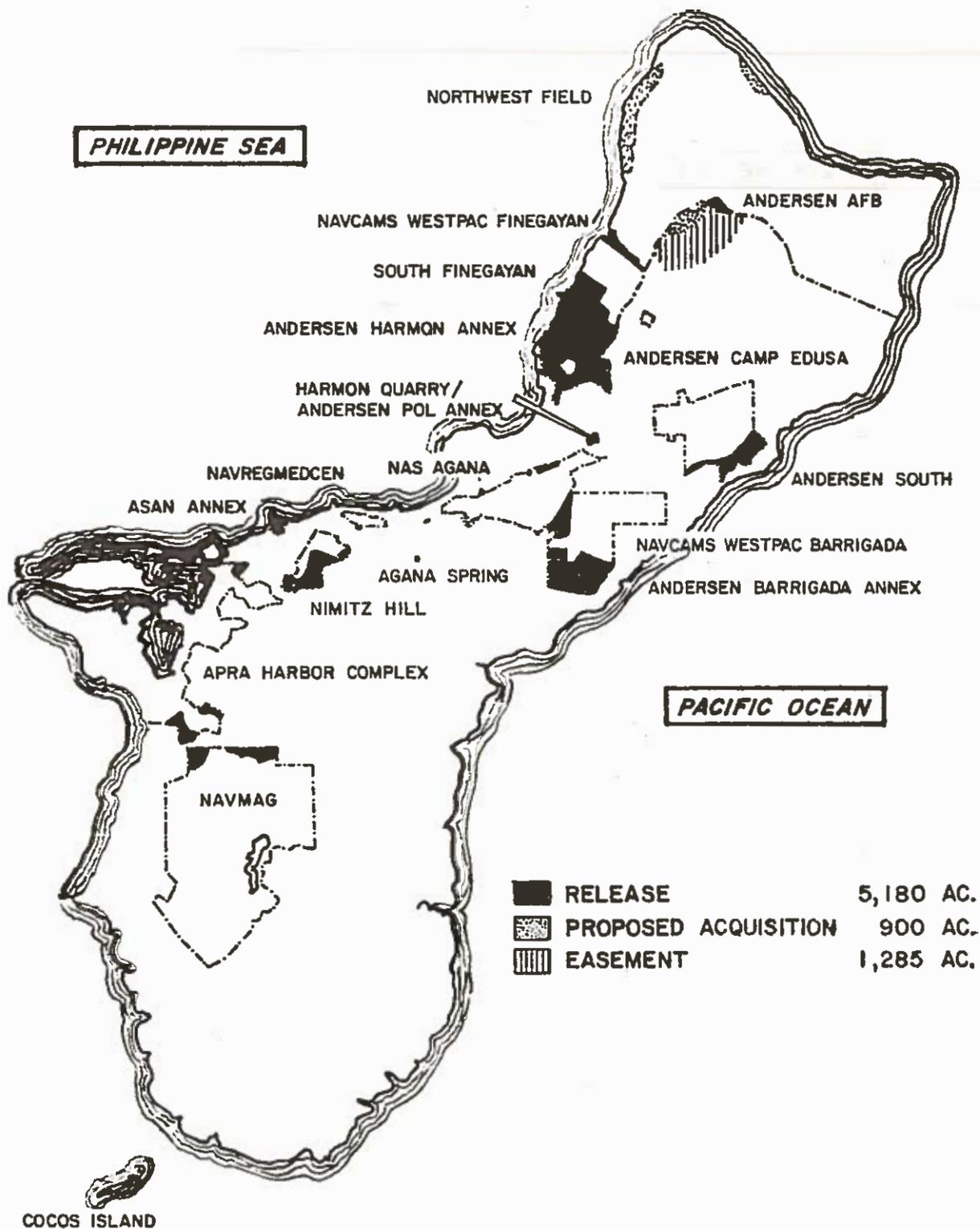
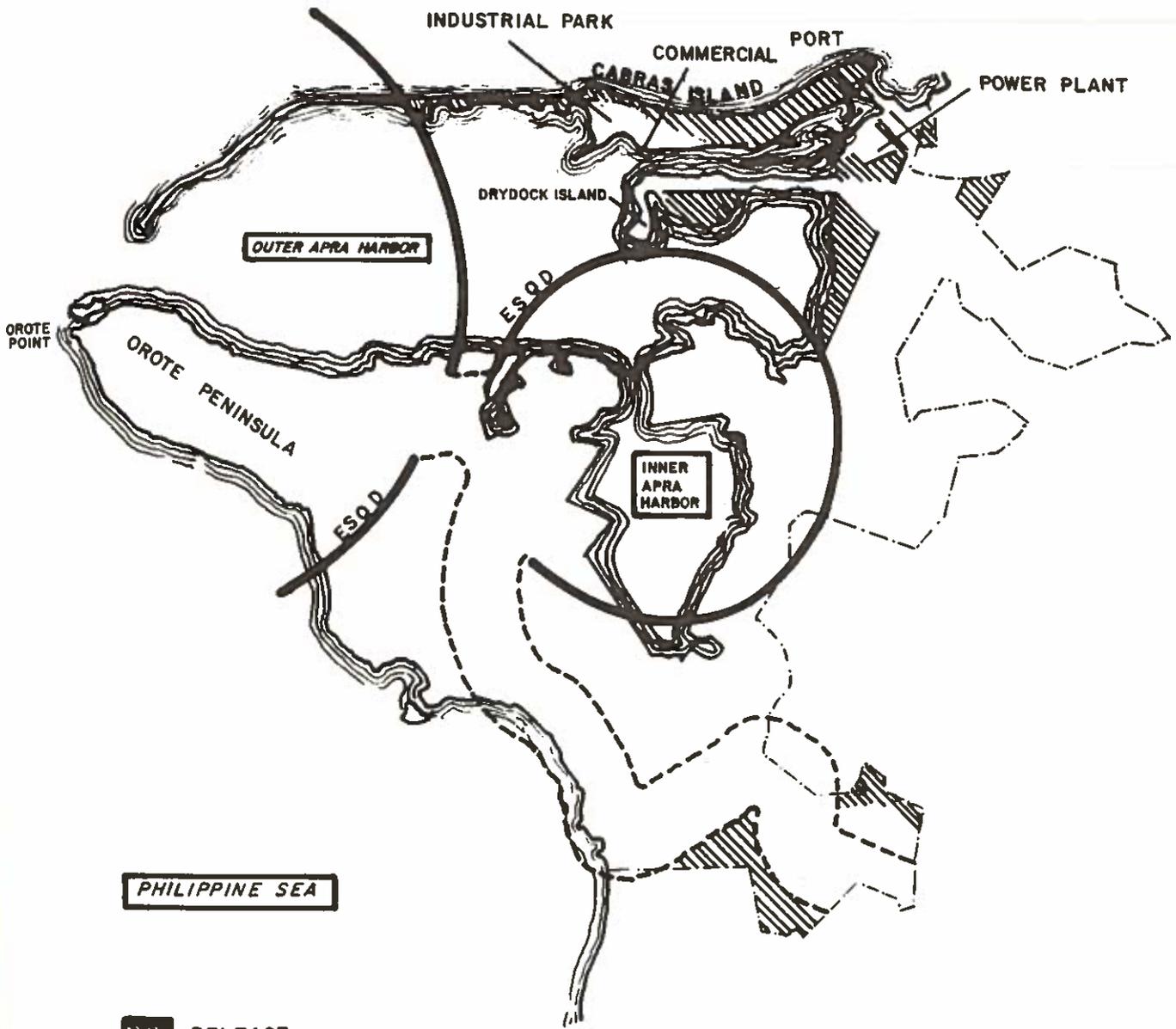


FIGURE II-1
RELEASABLE AREA / LAND ACQUISITION
ISLAND OF GUAM

SOURCE : GUAM LAND USE PLAN, DEPARTMENT OF THE NAVY, PACIFIC DIVISION, SEPT. 1977

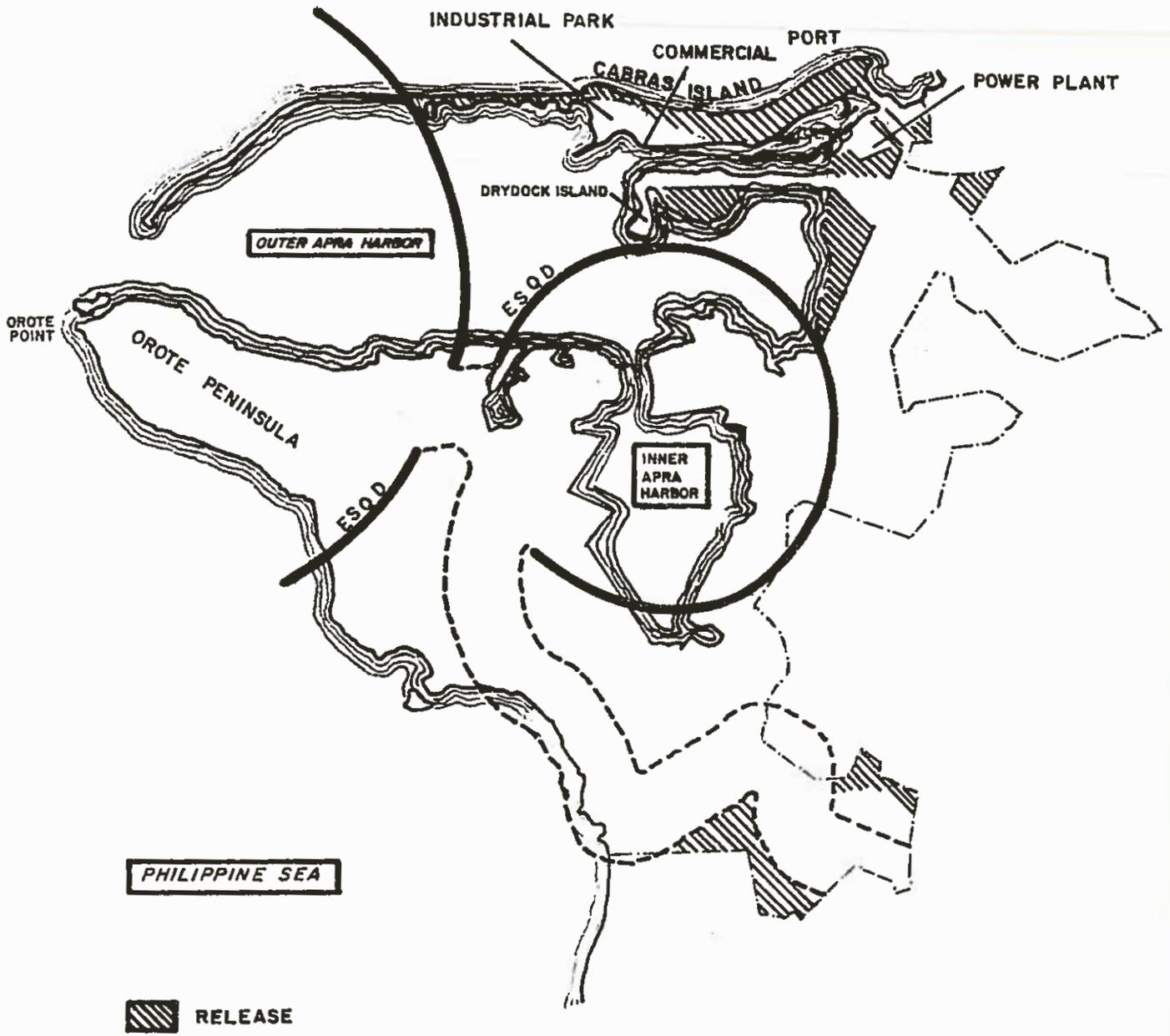


 **RELEASE**

E.S. Q. D. = EXPLOSIVES SAFETY QUANTITY DISTANCES

**FIGURE II-2
APRA HARBOR COMPLEX**

SOURCE : GUAM LAND USE PLAN, DEPARTMENT OF THE NAVY, PACIFIC DIVISION, SEPT. 1977



E.S. Q. D= EXPLOSIVES SAFETY QUANTITY DISTANCES

FIGURE II-2
APRA HARBOR COMPLEX

SOURCE : GUAM LAND USE PLAN, DEPARTMENT OF THE NAVY, PACIFIC DIVISION, SEPT. 1977

existing port facilities are presently overloaded. More civilian-controlled land in the Apra Harbor area is needed for expansion of the Commercial Port, establishment of a fish processing plant, expansion of tuna transshipment facilities and location of other port-related industries.

The much needed expansion and development of the Guam International Airport has continued by transfer of 67 acres of land from the Naval Air Station to the Guam Airport Authority.

Federal Laws

Aside from the limitations arising from the physical occupation of land, the federal government, through some of its laws, has imposed constraints on the economic development of the island.

Guam's fragile economy is controlled and governed by more than 400 federal statutes not all of which are beneficial to the island's businesses. Amendments to exempt Guam from certain federal constraints should be given top priority if the territory's industries are to follow a normal growth pattern.

Jones Act. The Jones Act provides that shipping of freight or passengers between points in the United States and its territories must be done in vessels built, registered, and owned by U.S. citizens. (It should be noted that American vessels pay much higher wages and are generally better maintained than foreign flag vessels, thus they are more expensive to use). This Act applies to Guam but not to American Samoa, the Commonwealth of the Northern Marianas, and the Virgin Islands and affects the economy in several ways. It puts a strain on local consumers by increasing the cost of imports and keeping the cost of living on Guam higher than most states in the mainland. The high cost of shipping discourages the establishment and promotion of light industries,

as it reduces the profit margin and the competitive edge which locally-produced goods might otherwise have. This Act also limits the development of commercial fishing as the act prevents the purchase or use of foreign-made fishing boats over 5 tons.

Defense Base Act. Section 1 of the Defense Base Act (DBA) requires that any contractor working on Federal contracts must provide for his workers' insurance according to standards set by the DBA. This Act is considered ambiguous as local contractors encounter difficulty in determining the extent of insurance needed or required by law. The act has resulted in increased bidding costs and has limited employment and growth in service industries and the construction industry, as it is difficult for these industries to carry DBA insurance when only a portion of their total business deals with military contracts. Many companies, particularly small contractors, find it hard to operate economically on military bases because of DBA requirements.

Air Routes. U.S. statutes provide that the right to fly from point to point within the country be restricted to domestically registered aircraft owned or controlled by American citizens. Because of Guam's strategic location, foreign airlines like Cathay Pacific, Nippon Airways, and Singapore Airlines have requested landing rights to Guam. The Civil Aeronautics Board (CAB) has only granted these airways landing rights limited to refueling purposes with renewal for request due every year. The air route restriction has placed Guam at an economic disadvantage concerning airline landing rights. Air accessibility severely limits the opportunity for Guam to develop as a regional headquarters or cargo distribution center for the Western Pacific. Being serviced by only four international airlines, the island becomes an unfavorable geographic site for large investment.

Quota Constraints. U.S. General Headnote 3(a), U.S. Tariff Schedules provides for free entry of manufactured articles which: 1) do not contain foreign materials of more than 50 percent of the total value, 2) come directly to the U.S. from Guam and 3) are not prohibited by "quota limitations." This is intended to give Guam businesses the advantage of duty-free import of raw materials and favorable custom regulations for export of finished products. However, the variability and ambiguity of quotas discourage most businesses to seriously consider the substantial initial investment needed to develop light manufacturing activity on Guam. In addition, the "substantial transformation" requirement that products do not contain foreign materials of more than 50 percent of their total value remains ambiguous to many manufacturers. It has not been determined whether the total value includes value-added or just costs of materials.

Environmental Protection. The Guam Environmental Protection Agency (GEPA) has granted both Guam Power Authority (GPA) and the Navy power plants a short-term variance to burn high sulfur fuel. Fumes from the high sulfur fuel blow out to sea most of the time, thereby sparing the island from the adverse effects of air pollution.

In the future, however, federal EPA regulations will require Guam power plants to burn costly low-sulfur fuel or install air pollution control devices at a high cost. Another environmental protection measure requires the upgrading of the sewage treatment facilities to full secondary level. On Guam, fulfilling this requirement would cost an estimated \$20 million. Secondary sewage treatment may not be required if effective deepwater outfalls are constructed. Since the ecology of Guam is unique, certain Federal environmental protection regulations should be modified for better applicability to an island environment.

International Loans. Because of Guam's U.S. territorial status, Guam is not able to participate in loans with large developmental financing institution such as the Asian Development Bank, the World Bank and the United Nations Development Program.

Quarantine Laws. Even though Guam is not a port of entry to the U.S., Guam is prohibited from importing cattle. However, plant seedlings, as well as juvenile shrimp, fish and crabs, strictly for Guam's use, are permitted through special exemptions. Requests for exemptions have resulted in costly delays and have hindered Guam's agricultural development.

Power Pool Agreement. To date, the Guam Power Authority (GPA) produces 75-80 percent of the island's electric power. GPA sells 20-25 percent of their total output to the U.S. Navy. Proposed amendments to the Power Pool Agreement will permit the Authority to become a viable utility company.

Immigration Laws. Immigration to Guam is regulated by the U.S. Immigration laws which allow any number of immigrants who qualify under the Immigration and Naturalization Service (INS) criteria. This lack of control over the number of residents in Guam has caused immense infrastructural problems. These problems are reflected in educational, residential, and health care needs, as well as various other public services that are required. A larger population places additional burdens on the existing infrastructure and creates a certain degree of unpredictability in infrastructure planning.

Objectives Related To The Federal Government

While the island economy acknowledges the benefits derived from the presence of the Federal government, improvements in some areas require a concerted effort. The Federal government should cooperate in meeting the following objectives:

1. Improve federal-territorial relations.

All federal actions affecting Guam should be subject to negotiation prior to implementation. Too often, decisions have been made in Washington, D.C. without consultation with the territory. Federal laws and regulations which have a desirable effect in the mainland may have a very negative impact on a small, remote island community. Guam needs more opportunities to provide input into decision making which affects economic development.

2. Ensure that military plans and programs are consistent with the territory's economic development plans.

In most cases, the U.S. Department of Defense plans and implements projects with little regard for the economic implications. The Federal government, mainly the Department of Defense, plays a paramount role in almost all segments of the economy - employment level, government revenue, land use, infrastructure, housing construction and other economic decision making. After due consideration is given to national security, the Federal and local governments must work together for the island's economic development.

3. Utilize more of the productive capacity of the island.

The military has a continuous and immediate demand for large equipment repair, skilled labor, and local sources of materials and supplies, including locally-produced fruits and vegetables. The private sector should be

allowed to better serve this market and the military should encourage development of local production of goods and services currently in demand.

Developmental Program Related To The Federal Government

1. Procurement of Military Supply Contracts.

The Government of Guam should try to purchase more of its supplies from local producers. The military should undertake a similar action. The combination of these two markets would create a market large enough for firms to stimulate increased manufacturing activity on Guam. The Government of Guam can lead the way by identifying goods and services that can be locally produced at a competitive price. The military should list those goods for military purchase.

2. Development of Manpower Resources.

The supply of skilled laborers and technicians has not kept pace with the demands of a growing economy. Numerous skills are not locally available, prompting importation of such skills. The apprenticeship program at the U.S. Navy Ship Repair Facility (SRF) has produced a number of tradesmen. This program has enhanced the local supply of skilled labor and should be continued.

Manpower development can be enhanced by increased recruitment for federal employment. Federal agencies do not have a standing policy for priority notification of local job applicants. The Guam Department of Labor should ensure that local job applicants be given priority for positions in the Federal government.

3. Tighter Controls on Military Exchanges and Commissaries.

The military caters to its needs through its own outlets, some of which are not properly controlled. To the local businessmen, these military outlets represent a major competitor with substantial government subsidy. Guam has an estimated population of 105,000, approximately 20 percent of which are military personnel and dependents who have legitimate access to the military outlets. Including retired personnel, some 50,000 customers patronize the base exchanges and commissaries. It is generally recognized that many authorized exchange customers purchase goods for friends. The unauthorized sales have not only burdened the private sector, but the local and Federal governments as well. The sales made at the military base are not subject to local gross receipts tax. The consistent unauthorized sales have artificially limited the civilian market size and discouraged many stores and other types of business from locating on Guam. To alleviate this problem, the military should implement tighter controls on the flow of base exchange and commissary goods.

The military outlets were originally designed to meet basic needs. It is recommended that these outlets should be limited to providing basic commodities and that the private sector should cover the non-basic commodities. The Chamber of Commerce, as a representative of the private sector, should meet with the military to develop an agreement toward a more equitable market.

4. Improve the Review Process for Federal Legislation.

Because certain Federal laws have seriously hindered economic development, an updated attempt should be made to investigate the applicability of existing Federal laws to Guam. In the interest of the island's

welfare, it is recommended that the Office of the Territorial Affairs, Department of the Interior be upgraded and should:

be responsible for a thorough investigation of pertinent Federal laws, their implication in terms of supportive documentation on revenue loss due to business discouraged by these laws and the higher cost of doing business.

be able to make recommendations regarding each Federal Law, such as the exemption of Guam from the Jones Act, amendment of the Defense Base Act, control of immigrants to Guam, and others.

present recommendations to the U.S. Congress for amendment of existing laws.

5. Release of Federal Land

The need to protect southwestern Guam's unspoiled coral reefs and lagoons, volcanic uplands, and tropical vegetation for recreational, scenic, and scientific use of residents and visitors of Guam has long been recognized. This conservation movement was first started in 1952 and is currently formally proposed as a Guam Territorial Seashore Park. The Seashore Park would be located in Southern Guam, surrounding the communities of Umatac and Merizo. The importance of the federal government to this program stems from its ownership of a portion of land within the boundary of the proposed park. The Department of Parks and Recreation should continue its efforts to obtain legislation for the Guam Territorial Seashore Park.

Port expansion (as discussed in the Industrial section) is required for increased transshipment activity, a tuna cannery, and an ocean thermal energy conversion plant. The local government should actively pursue the acquisition of military land on Cabras Island, Dry Dock Point, and land adjacent to Route 1 up to Polaris Point.

B. Visitor Industry

The visitor industry developed in the sixties after the President of the United States lifted local Navy security clearance requirements. Commercial air service from Tokyo was inaugurated in 1967 followed by a phenomenal growth in tourism. Lack of hotel rooms in the late sixties and early seventies was a problem which was quickly remedied by a rapid growth of the hotel industry.

Table II-6
VISITOR ARRIVALS AND TOTAL NUMBER OF ROOMS IN
GUAM'S HOTEL INDUSTRY, 1969-1977

Year	Visitor Arrivals	Per Cent Change Over Previous Year	Number of Rooms	Per Cent Change Over Previous Year
1969	58,265	-	680	-
1970	73,723	+ 26.5	1,019	+49.8
1971	119,124	+ 61.6	1,235	+21.2
1972	185,399	+ 55.6	2,093	+69.5
1973	241,146	+ 30.1	2,253	+ 7.6
1974	260,568	+ 8.0	2,582	+14.6
1975	239,695	- 8.1	2,555	- 1.1
1976	201,344	- 16.0	2,354	- 7.9
1977	240,467	+ 19.4	2,354	- 0.0

Source: Guam Visitors Bureau.

During 1975 and 1976, the visitor industry suffered its first major setback, resulting from the worldwide oil crises that crippled the Japanese economy. Pan American cancelled its charter flights between Guam and Japan in April 1975. Recovery has been slow, affected by the increased competition of other visitor destination areas and a reduction in airline seats available to Guam.

Table II-7
DISTRIBUTION OF VISITOR ARRIVALS BY COUNTRY OF ORIGIN, 1969-77
(Percent)

Year	Japan	North America	Micronesia	Other
1969	50	32	9	9
1970	60	24	8	8
1971	71	17	6	6
1972	75	16	4	5
1973	70	15	7	8
1974	66	11	8	15
1975	67	9	8	16
1976	69	9	8	14
1977	63	13	8	16

Source: Guam Visitors Bureau.

Potentials

Tourism is an industry which possesses strong growth potential, for the following reasons:

- a. Guam's proximity to Japan, its strategic location in the Pacific between Asia and America as a part of the U.S., makes the island a unique place as a tourist destination and as a business/financial center.
- b. Guam has opportunities for expanding air routes. Potential airlines include Philippine Air Lines, Garuda, Singapore International Airlines, Cathay Pacific Airways, and All Nippon Airways.
- c. Guam's political condition is a favorable factor for foreign investment. Guam has a history of political stability which is necessary to attract long-term investment.

- d. The attitude of the Government of Guam is especially favorable to foreign investors because of the Government's "open arms investment policy" with tax rebates and exemptions.
- e. Guam possesses outstanding natural beauty. The beaches and coral reef, caves and waterfalls, scenic vistas and natural jungles, as well as tropical trees and flowers, are excellent attractions for tourists in general, and Japanese tourists in particular.
- f. Guam is an island attraction with its unique heritage, language, and culture. Its culturally plural society is unique and can lure adventurous tourists who seek a varied educational experience.

The future of Guam's visitor industry looks promising, with visitor arrivals expected to increase steadily. Airline service to the territory will be a critical factor in determining the rate of increase. Visitor arrivals could easily grow at 7 to 10 percent per year, provided that additional airlines enter the market. The growth rate could be 15 to 20 percent if the Japanese government allowed their domestic carrier, All Nippon, to come to Guam.

Table II-8
PROJECTED VISITOR ARRIVALS AND EXPENDITURES
ON GUAM, 1978-83

Year	Number of Visitors	Visitor Expenditures ^{1/}
1978	264,500	\$132,000,000
1979	278,000	139,000,000
1980	300,000	150,000,000
1981	321,000	160,500,000
1982	343,500	171,750,000
1983	367,500	183,750,000

^{1/} in constant 1978 dollars

Source: Guam Visitors Bureau, June 8, 1978.

Constraints

There are several important constraints that must be carefully considered in planning for tourism development. These include:

- a. Protectionism for national air carriers severely hampers governmental approvals for additional commercial air services to Guam.
- b. Tumon Bay lacks a number of basic infrastructural facilities, such as sidewalks, bicycle paths, and better lighting, all needed to provide a safe and attractive hotel zone. Storm drainage outfalls near the hotels currently empty directly into the bay and are causing increasing levels of pollution and algae growth. Water and sewage facilities are inadequate. Tumon beaches require a continuous program of cleaning and maintenance.
- c. Strip development and urban sprawl have created unattractive shorelines. Abandoned cars and roadside litter have degraded the environment and scenic beauty of the island.
- d. There is a lack of tourist facilities and activities to provide visitors with a variety of attractions necessary to attract their interest and to encourage return visits. More recreational and cultural activities are needed, both of a public and a commercial nature.
- e. The lack of an efficient transportation system limits the experiences of the Japanese visitors. A public bus system would allow visitors to explore Guam at their own pace and visit shops and other attractions not patronized by tour services.

- f. The high rate of crime on Guam in general and crimes against tourists have created unfavorable publicity in tourist originating countries.

Air fares in the Pacific area are high, constraining the growth of air traffic in the region. A reduction in Pacific air fares would make Guam and the Asian areas more attractive to North American travellers, who are attracted to Europe by low transatlantic fares.

Japanese Tourist Profile

Although the number of visitors from other countries has been increasing, the Japanese visitors continue to account for more than two-thirds of all visitors to Guam. Some interesting points about the Japanese visitor are:

- . nearly 85% of the Japanese tourists visit Guam only; another 15% visit other destinations e.g. Saipan (BP)
- . about 60% of the Japanese visitors are between the ages 18-29 (NRI)
- . about 45% of the Japanese visitors are married (NRI)
- . about 50% of the Japanese visitors are high school graduates; an additional 39% are college graduates (BP)
- . about 40% of the Japanese visitors are either professionals and technicians or administrators and managers; another 40% are office workers and clerks (BP)
- . slightly over half of the Japanese visitors have personal incomes between \$3,000 and \$10,000 (NRI)
- . about half of the Japanese visitors have family incomes over \$15,000 (NRI)

- . over 95% of the Japanese visitors come to Guam for pleasure (BP)
- . nearly 85% of the Japanese visitors are first-time visitors; for about 50%, it is their first trip overseas (NRI).
- . over 80% of the Japanese visitors come from three regions in Japan: Kanto, Chuba, and Kinki (BP)
- . about 85% of the Japanese visitors come on package tours (NRI)
- . the activities incoming Japanese tourists expect to enjoy most are swimming (85%), the tropics (63%), and shopping (39%) (NRI).

Note: BP = Bureau of Planning; NRI = Nomura Research Institute.

Peak tourist season months on Guam are March and August, which coincide with the school vacation in Japan. The seasonal fluctuations are excessively high with the ratio of highest-to-lowest month for Guam visitors at about 3.5 (the ratio for all Japanese travelers abroad in 1975 was 1.6). To reduce the seasonal fluctuations, different classes of Japanese tourists and non-Japanese tourists must be recruited.

The scheduled events on a typical four-day Japanese package tour include:

First day: Visitors check into their respective hotels and are immediately given a briefing on "do's" and "don'ts" by tour operators. This is followed by a welcome cocktail party with dinner and Pacific island show completing the evening.

Second day: Begins with a half-day central island tour followed by a couple of hours browsing through selected shops. Visitors have free time from mid-afternoon on.

Third day: Basically a free day during which visitors may take optional tours (e.g. one day excursion tour to Cocos Island, golf, and fishing).

Fourth day: Half-day of shopping; balance of the day and evening free.

The above schedule indicates that Japanese visitors have a lot of free time during their stay. Because of a lack of attractions, and also because of the lack of an efficient transit system, Japanese visitors spend a great deal of their free time wandering around hotel premises and shops.

A Bureau of Planning survey asked Japanese visitors what their reactions to Guam were, compared with what they had expected. Two-thirds of those interviewed found Guam "average," 15 percent found Guam better than expected and 15 percent found Guam disappointing. These mediocre reactions probably help explain why Guam has had a low rate of return visitors from Japan compared with Honolulu. More attraction like the Cocos Island tour, are needed to provide tourists with a more interesting experience. The Cocos Island tour is rated by many Japanese tourists as the highlight of their stay in Guam. A cultural center, aquarium, and sound and light shows are examples of attractions that would appeal to tourists as well as local residents.

While Guam has been a vacation spot for young Japanese, the result of a Guam Visitors Bureau sponsored survey in Japan of what upper income, middle aged Japanese think about Guam show a potential for expanding the Japanese market. About 48 percent of this relatively high income and older group were interested in visiting Guam.

Visitor Expenditures and Lengths of Stay

Japanese visitors spend significantly more per person per trip than most other visitors, although their length of stay is generally shorter. A Japanese visitor will spend an average of \$579 in Guam over an average stay of 4.4 days, according to the Bureau of Planning Visitor Survey. U.S. visitors averaged 14.4 days and spent \$486; however, the survey results are strongly influenced by a few U.S. visitors who stayed with their military spouses for a long period of time.

A breakdown of visitor expenditures is given in Table II-9. The estimates are subject to error because many visitors could not recall their expenditures by item, and all reported expenditures which did not specify expenditure types but were assigned to the "other" category.

Estimated total visitor expenditures in 1976 approximate 93 million dollars, or 15.4 percent of Guam's total business receipts which in 1976 amounted to approximately \$602 million. Japanese visitor expenditures account for three-fourths of total visitor expenditures.

About one-third of total expenditures were for food, lodging, and entertainment; one-third for jewelry, perfume, liquor, tobacco, photo supplies, and souvenirs; and one-third were of a miscellaneous nature.

Table II-9
VISITOR EXPENDITURES* PER PERSON PER TRIP, BY TYPE OF EXPENDITURES

Expenditure Type	Japanese Visitors	U.S. Visitors	Other Visitors
Total	\$578.61	\$485.94	\$365.15
Lodging	70.16	108.44	41.65
Meals	101.88	55.24	56.70
Ground Transportation	45.26	36.32	8.60
Entertainment	22.61	25.74	28.03
Jewelry	46.26	6.47	9.58
Photo Equipment and Supplies	10.61	1.06	0.00
Liquor and Tobacco	53.76	3.38	4.35
Perfume	44.62	0.00	2.13
Gifts, Souvenirs and Other	183.45	249.29	214.13

Note: (*) Less round trip airfare.

Source: Guam's Visitor Industry; An Economic Assessment, Economic Planning Division, Bureau of Planning, Government of Guam, July 1977.

Employment Impact

To estimate the employment impact of visitor expenditures in Guam, an input-output table was adopted from the County of Kauai, Hawaii because of its similarity in economic structure to Guam. The results suggest that some 3,000 to 4,000 jobs depend directly on visitor expenditures and another 500 to 1,000 are attributable to the indirect effect of these expenditures.

Objectives for Visitor Industry Development

To guide the development of the visitor industry, the following objectives are recommended:

1. Expand the tourism base.

The base of Guam's visitor industry is narrow, consisting primarily of young Japanese tourists. Expansion of the visitor base can occur within the Japanese market and in other selected countries. Japan will continue to be the major source of tourists and therefore top priority should be to fully develop this market area. Japanese family travel is beginning to boom and should be actively promoted for Guam. Japanese visitors should also be encouraged to travel the FIT (Foreign Independent Travel) way which allows for more varied experiences than the packaged tour. Outside of Japan, Korea and North America offer the best potential for market development.

2. Promote longer stays and return visits of Japanese tourists.

Japanese tourists spend approximately 3 to 4 days on Guam yet spend 7 to 8 days in Hawaii. There are also very few return visits among Japanese tourists. Ways and means of increasing visitor satisfaction must be developed including provision for more and better

tourist attractions, recreational facilities, and promotion of better cross-cultural experiences. An increase in the average visitor stay of one day is roughly equivalent to a 20% increase in visitor arrivals, with a corresponding increase in the economic benefits of tourism.

3. Concentrate hotels and major resort facilities in Tumon Bay.

Tourists can best be served if hotels and major resort facilities are located in the same area. Provision of infrastructure such as sewer, water, and roads is less expensive than if facilities are scattered. Other government services such as fire and police protection are also more effectively provided in centralized areas. These factors contribute toward better service and lower costs to hotels and tourists.

4. Take a regional approach towards tourism.

Marketing of tourism is dependent upon the drawing power of tourist regions as well as individual tourist destinations. Thus, the Caribbean market competes with the Pacific in attracting American tourists, and Micronesia competes with the Asian and North American (including Hawaii) markets in attracting Japanese tourists. A regional approach considers the development of Saipan and other Micronesian areas as major tourist destinations to be essentially complementary with Guam's tourism development. Guam should promote itself as the hub of Micronesia from which trips to the five districts of the Trust Territory and the Commonwealth of the Marianas can be made.

5. Maximize the benefits of tourism to Guam residents.

Guam residents have, for the most part, accepted tourists as guests. There are very few social problems that have arisen despite several hundred thousand visitors to Guam per year. However, the handicraft and other items purchased by tourists are not produced locally, but are imported.

There is a reluctance among Guamanians to work in the tourist industry and a heavy reliance on permanent resident aliens. Through public awareness programs, promotion of the Japanese language in high schools, labor training programs, promotion of tourist-oriented industries and expansion of agriculture and fisheries, Guam will be better able to capture the economic benefits of tourism.

Strategy for Development of the Visitor Industry

1. Development of Tumon Bay as a Resort Area

In order to capitalize on existing tourist facilities in Tumon Bay, development of this area must be given top priority. A development plan for Tumon Bay is recommended as the keystone of the Comprehensive Development Plan for tourism. This should take into account development goals and objectives as well as environmental, social, and economic factors. The program should include:

- . Inventory and analysis of existing facilities, resources, and land uses in Tumon Bay
- . Relocation of inappropriate land uses and support facilities, and determination of priorities for such relocation
- . Analysis of infrastructure needs, including sewer, water, power, sidewalks, bikepaths, safe hiking trails, and an efficient public transportation system
- . Determination of appropriate funding sources including private investors, local government and Federal government.

A number of projects are in the planning stage, and should be considered in the development plan. These include:

- a. Convention Facilities. Since facilities exist, and since Guam has the potential to become a business, transportation, and communication center, these assets should be used to attract conferences, conventions, and cultural affairs through coordinated promotional programs. Better utilization and promotion of existing multipurpose facilities can create and expand contacts with the international business community.

A feasibility study of a convention center and other commercial attractions for Tumon Bay is being conducted by the Department of Commerce. It is envisioned that the facilities should be readily accessible to the Tumon Bay area where a majority of the hotels are presently located. In addition, various factors will be considered in the feasibility study to determine the most appropriate location for convention center facilities in Guam. The center would attract business persons, investors, and professional people.

- b. Amphitheater. Another development under construction in the Tumon Bay area is an amphitheater. This project includes a concrete stage, performers' dressing rooms, toilets, walkways, paths, and parking facilities and will house such activities as performances of theatrical productions, Chamorro plays and concerts. This \$1.35 million amphitheater is being financed by funds from the Economic Development Administration and is expected to be completed by the end of 1978.

- c. Commercial Attractions. The designation of Tumon Bay as a resort zone allows for specific types of commercial development which are complementary to a resort-hotel area. Restaurants, duty-free shops, and compatible recreational and cultural attractions are needed in this area to provide the tourists with a greater variety of things to do. All commercial projects must be well-designed and landscaped to enhance the area.
- d. Infrastructure. Construction of a walkway fringing the ocean side of San Vitores Road is vitally needed for the safety of tourists. The land bordering the walkway and San Vitores' Road should be landscaped to provide visitors with an attractive place to walk and to provide a sense of continuity to Tumon Bay. A proposed bikeway to be built adjacent to the walkway should be given serious consideration as a way to increase visitor mobility and to provide an added recreational activity for tourists.

At the present time, the 2000 hotel rooms in Tumon Bay are served by a 6-inch water line, resulting in low water pressure in the rooms and a hazardous limitation on firefighting capability. The Public Utility Agency of Guam (PUAG) has developed plans and specifications for the construction of 13,000 linear feet of 12" water line, which would provide sufficient water for ultimate development of the hotel/resort zone. Also included in the project is the installation of 5 fire hydrants.

2. Development of Tourist Attractions

To meet the objective of getting tourists to stay longer and encourage return visits to Guam, more developed attractions are needed. Hawaii has numerous attractions (e.g. Polynesian Village, Sea Life Park, the zoo, King's Alley, Ala Moana Shopping Center) which can each occupy a half day of the tourist's time. Guam presently offers three basic tours: the southern or "Cocos" tour, the town (shopping) tour, and the night-life tour.

Many of the attractions are essentially commercial and therefore fall within the domain of the private sector. The government is not in the business of entertaining tourists, but should consider projects where (1) considerable "social" or "merit" wants are involved and (2) the private sector is not willing or able to implement them. Public funds for development of these activities should come from the Tourist Attraction Fund and other sources.

There are many aspects of Guam's history and culture that appeal to tourists. Guam has an intriguing history, from the pre-contact days through the Spanish colonization period, the American colonial period, the World War II period, and up to the present period as a self-governing territory of the United States. The environment and culture are interesting to tourists, because for many it is their first trip to a tropical island. The vegetation, the sandy beaches, Guam's extensive coral reefs and lagoons, the plentiful fish and shells are fascinating to the visitor. Opportunities for scuba diving, snorkeling and fishing should be readily available to the tourists. Development of these facets of Guam will lead to enhanced visitor satisfaction and at the same time provide local residents with a better appreciation of their island.

Guam has made significant progress in the past year in providing more attractions for visitors. The government has completed the construction of the Public Market the new Government House. Both of these projects are accessible to tourists and are contributing to the development of Agaña as a major tourist destination area. The construction of Chamorro villages in Inarajan and Umatac (Lanchan Antigo) have made available additional destination points for tourists. In the private sector, Cocos Island has emerged as a popular tourist destination point and an enterprise offers safari tours into the interior of Southern Guam. Attractions strongly recommended for development include:

- a. Micronesian Cultural Center. The success of Hawaii's Polynesian Cultural Center indicates that a strong potential exists for Guam to develop, along similar lines, a Micronesian Cultural Center. Such a center would be harmonious with the recommended policy of promoting Guam as the hub of Micronesia. Private sector interest has already been shown in such a project.
- b. Expansion of the Museum. The present building in the Plaza de Espana is too small to effectively display all of the collected artifacts. Lack of adequate facilities have also prevented the museum from broadening its collection to include materials and specimens of fauna, flora, art, etc. of Guam. The estimated cost of an expanded museum is \$424,000.
- c. Aquarium. An aquarium was the most preferred attraction of Japanese tourists interviewed in the Bureau of Planning survey. Since the number of visitors does not yet justify a marine park such as found in Hawaii, a more modest version consisting of an aquarium and exhibits could prove economically feasible in the interim. The University of Guam (UOG) Marine Laboratory is investigating the potential for such a project in conjunction with its research activities.

- d. Marina Activities. The development of the Agana Marina has provided a convenient location for charter boating and deep sea sport fishing. Japanese visitors have indicated a strong interest in sport fishing. More private sector activity in this area should be encouraged. Government construction of Phase II of the Agana Marina will encourage this development.
 - e. Recreational Activities. A major park area is needed with well-planned hiking trails into the interior of the island. More aquatic activities, such as sailing, surfing, water skiing, and skin or scuba diving must be developed. Underwater trails should be developed for snorkelers, marking the different varieties of coral and marine life found within the reef habitat.
 - f. Sound and Light Show. This multi-media production can very effectively portray the history and culture of Guam. The show uses the natural environment as a background and the light and sound media to portray events in a way that the viewer relives the events of history.
 - g. Botanical Garden. Being a flower-loving people, Japanese tourists would especially appreciate a well-planned botanical garden. In one recent survey, 11 percent of Japanese visitors indicated that they preferred to see this attraction developed on Guam. The UOG Marine Laboratory is considering development of a botanical garden, and the Dededo Botanical Garden should be reactivated.
3. Development of the Paseo de Susana as a Tourist Destination Area.

The Paseo is an open-space and recreation area of 30 acres extending into Agana Bay across from downtown Agana. There is a quiet park area, baseball fields and other sports facilities at the Paseo, in addition to Guam's

Statue of Liberty, and the Statue of Chief Quipuha. The Paseo is also the site of the Public Market and the Agana Marina.

Development of the Paseo as a recreational and cultural area for the enjoyment of tourists and residents alike is highly recommended. The preparation of an area development plan for the Paseo is needed. Other attractions to be considered in the plan are:

- . sound and light show
- . deep sea fishing activities
- . seafood restaurants
- . improvement of the Paseo Park

4. Education and Labor Training Programs.

The tourism education and labor training programs should include an orientation in all aspects of the industry, consisting of a description of the tourist industry, an explanation of the types of businesses related to tourism, and the job opportunities available. Such an orientation should be provided within the educational system of the island. Beginning in the lower educational level, young people should be provided with some idea of the benefits of tourism and how they can help tourism help Guam.

The higher educational level should provide background and technical training so that the primary source of labor in the tourism industry would be the local population. It should also be the responsibility of private firms to provide on-the-job training and apprenticeship programs and to coordinate with the educational system to provide a complete program for local training. Greater local participation should be developed through public educational programs on the benefits of tourism. The Guam Community College should establish labor training programs which

would involve food and beverage preparation. At the high school level, students should be encouraged to take Japanese as a foreign language.

5. Initiate Public Awareness Programs.

The Guam Visitors Bureau should continue to inform the residents of Guam on the benefits of tourism to the economy, and also how they can help tourism help Guam. The objective of these programs is to better integrate tourism into the local economy.

Already several organizations and communities are involved in special projects to create improvements to our visitor industry including development of the performing arts, design of local handicraft and souvenirs, and the formulation of people-to-people programs to bring the tourists closer to the island's residents. Two people-to-people programs have already been inaugurated: the STEP - Special Tourism Education Program and the WAVE - Welcome All Visitors Enthusiastically. Another program inaugurated by the GVB in cooperation with the UOG is the port receptionist program, whose duties include greeting arriving visitors to the island. The 1977 "Home Visit" experiment in December 1977 was very successful with 80 Guamanian homes hosting some 600 Japanese girls.

6. Island Beautification.

Landscaping and maintaining the island's parks and recreational areas must be a continuing program and all of Guam must contribute in order to enhance the island's natural beauty. The Department of Parks and Recreation is involved in design, beautification and maintenance of island parks and recreational areas. Whenever possible scenic overlooks and recreational facilities should be provided.

The island's businesses should be involved in landscaping their area with varieties of flowers and trees that grow well on Guam. Island residents and government facilities should also be encouraged to participate in extensive flower and tree planting. Such a program is even more beneficial to residents than to our temporary visitors.

An anti-litter educational campaign by the GVB is underway. In addition to the educational program, an islandwide campaign should be initiated to clean-up the litter that presently degrades the physical environment. The GVB should continue to provide public awareness programs - that it is everyone's responsibility to do their part in enhancing the island's natural beauty in order to make Guam a better place to live and visit.

A clean-up of the beaches in Tumon Bay is needed. Storm drainage outfalls around the hotels are causing increased pollution and algae growth. Efforts must be made to divert outfalls to treatment facilities to eliminate the major cause of pollution in the Bay. Because of their short-lived effects clean-ups must be performed on a regular basis.

7. Public Safety.

Tumon Bay has had crime problems. Because of the presence of tourists and a locally popular beach, it has been the site of rape, robbery, and murder. Crimes against tourists are widely reported in the Japanese press and, if allowed to go unchecked, can destroy the tourist industry. The Guam Department of Public Safety (DPS) has established a motorcycle patrol of the beach, and this program has met with pronounced success. It appears that the establishment of a regular police presence on the Tumon Bay beach,

instead of occasional patrolling by automobile along San Vitores Road and through the hotel properties, has proven a very effective deterrent to crime. Since the police patrol has had excellent success, establishment of a regular police substation with direct responsibility for the Tumon Bay area is clearly warranted, in conjunction with provided security to the elderly housing project at Serena Beach.

The staff of such a substation would have several responsibilities. Foremost among these is to maintain the motorcycle police patrol of the beach. These officers would also be charged with monitoring hotel security procedures. Patrol activities along San Vitores Road would be scheduled to coincide with the tourist traffic to and from the night spots and shows. They would provide a central location to report crimes, and to procure immediate police assistance.

Prosecution of tourist-related crimes is difficult since tourists generally leave the island before trial. The current policy of returning victims at public expense to testify against alleged offenders should be continued.

8. Expansion of International Air Routes.

As the visitor industry has developed, Guam has become increasingly aware of its inability to influence one of the industry's key components - air transportation. Guam should have more competitive air service to the island. In total, 17 air lines are seeking routes and/or changes in service to Guam. All Nippon is seeking permission to provide charter service between Japan and Guam but the Japanese Government has opposed their application in the past. Air Nauru is interested in serving Guam from Kagoshima in Southern Japan. Such airline activities would definitely help spark Guam's economy. The U.S. Civil Aeronautics Board's approval is required in addition to approval of the countries involved.

Guam should support current efforts to partially deregulate the airline industry to allow easier entry of airlines into Guam. Guam's aircraft service needs, as they relate to non-American carriers, should be decided by Guam authorities. Until this happens, Guam must actively support the airlines seeking new or additional routes, in their requests to the governments involved.

Air rates in the Pacific are unreasonably high. The recent lowering of transatlantic air fares has increased airline profitability because of a growth in passengers traffic. Pacific fares must be lowered to allow an expansion of transpacific travel.

9. Expand Airport and Related Facilities.

Because of its strategic location, Guam is the hub of the Western Pacific. As a result, the Guam International Air Terminal has become a major center of air transportation. Expansion of airport facilities must keep pace with the growing visitor industry and island needs.

The Guam Airport Authority intends to construct a \$26 million passenger terminal by the end of 1980. The proposal for the new terminal provides for a three story building that will house a third floor restaurant and cocktail lounge, a "hafa adai" garden, snack bars, an elevated greeters lobby, VIP lounges, modern loading and unloading bridges, and large departure and arrival lounges.

10. Improve Public Transit for Tourists.

The island should consider ways to improve visitor mobility. This is especially important to Guam's Japanese visitors who, by and large, cannot drive automobiles and hence cannot use rental cars. Relatively great distances, even between hotels, and the absence of sidewalks in Tumon Bay, often isolate visitors in their hotels. Action has been taken to begin

operation of motorized bicycles (mopeds) as a form of transportation for the tourist. But the island needs more to improve its visitor mobility. Alternative modes of public transit are needed. As a minimum, a regular bus service between the hotels and to Agana should be established. Such a service is the responsibility of the private sector until an islandwide mass transit system is established. Government subsidy may be needed to stimulate private development of the system. Government should also protect the interests of the potential transit enterprises, who have in the past been vandalized by competing interest groups.

C. Industrial Development

The manufacturing base on Guam is limited to the categories of food processing, printing, oil refining and assembly operations. In the sixties, manufactured goods consisted of bakery products, dairy goods, ice products, soft drinks, watch assembly, printing and local handicraft. The manufacturing base broadened in the seventies, with the emergence of an oil refinery, a brewery, a feed mill, several garment and textile firms and rock crushing firms which grew and flourished with the construction industry. Most of the products being manufactured on Guam today are primarily destined for local rather than export markets. The garment and watch industries are notable exceptions.

In the very early 1970's, there were approximately 1,000 employees on the payroll of manufacturing firms. This peaked in late 1973 with 1,800 employees in manufacturing. A decline in employees started in 1974 and reached its lowest point in the second half of 1976, at 800 employees. Concurrent with the upturn in the economy, there has been an increase in manufacturing, with about 1,000 persons currently employed in this sector.

Potentials

The location of U.S. military bases on Guam brings in substantial revenue and expands the local market through military procurement needs, expenditures of military personnel and dependents, and wages and salaries paid to civilians working for the military. Significant federal funds, other than defense spending, are available to Guam.

As the largest and most developed island in Micronesia, Guam is a logical business and commercial center for the Trust Territory. The projected development within the islands of the Northern Marianas and the Trust Territory will encourage further trade among the islands.

Guam lies close to Asia, and with its stable political status, has attracted considerable investment from this area. The Japanese have made investments in the tourist industry, catering to the large number of Japanese tourists. Guam is also conveniently located for Chinese who want their investments close to home. Developing U.S. trade with the People's Republic of China could establish Guam as a transshipment point in both directions, performing activities such as assembly, bagging, and packaging.

Other factors favorable to industrial development on Guam include:

- . the free port status of Guam
- . generous tax and financial incentives available to potential investors
- . under certain conditions, Guam products which do not contain dutiable foreign materials exceeding 50 percent of the total value, can be shipped to the U.S. duty free
- . no balance of payments constraints because of association with the U.S. and
- . the large number of commercial banks on Guam with access to world money markets.

Constraints

There are a number of factors which constrain the volume of manufacturing and transshipment on Guam. The main factors are:

- . a small internal market preventing large-scale manufacturing
- . a lack of industrially-developable natural resources which leads to an excessive dependence on imports
- . Guam's remoteness from supply sources which results in high transportation and communication costs and high working capital requirements
- . a lack of skilled labor and middle management which in the past have been met through employment of alien contract workers and company transfers
- . inadequate commercial port facilities, including insufficient wharfage, and lack of land for container storage and
- . uncertainties in the setting of federal quota restrictions and administration of the "substantial transformation" requirement by U.S. Custom authorities.

Manufacturing for the Local Market

The population of Guam is slightly over 100,000 and even if we include all of Micronesia, the population constituting the regional market is less than 250,000. Per capita income is low in the region, such that the total aggregate demand is substantially less than a U.S. mainland community of comparable size. Factories producing for this small market must be of modest size, foregoing the economies of scale that can be captured by larger firms.

There is potential for a moderate increase in local manufacturing and assembly and modest diversification of the industrial base. Guam's remoteness from the major industrial centers and the high cost of transportation create opportunities for a number of light manufacturing and assembly operations, such as furniture assembly and garment manufacturing. Guam trade statistics reveal that: the

export volume is about 10 percent of the import volume; and the large volume of imports (\$268 million in 1976) suggests many new opportunities for local manufacturing.

It is true that Guam lacks most of the resources used by heavy industry, like oil and metals. But for purposes of light industry, there are a number of resources that can be exploited, including clay, and limestone. Two growth sectors, construction and tourism, have not been adequately exploited by local resource-based firms. Some of the products that could be produced are bricks, cement, particle board, paints, jewelry, and variety of handicraft items. Nearly all handicraft presently sold to tourists is imported.

Manufacturing for the Export Market

Generally speaking, under provisions of Section 301 Headnote 3(a) of the U.S. tariff law, Guam's products can enter the U.S. duty-free if they do not contain taxable foreign materials exceeding 50 percent of their total value (70% in respect to watches). The products which may give Guam a competitive advantage in the U.S. market will be those products with high U.S. duty and in which the cost of foreign components is substantially less than that of U.S. suppliers. This means that a product should generally be ineligible for duty-free treatment under the U.S. Generalized System of Preferences (GSP), as extended to certain Beneficiary Developing Countries (BDC's). Even though Guam may also qualify for duty free treatment under the GSP, it is unlikely that Guam can compete with such industrial countries as Singapore, Taiwan, and Korea who are also BDC's. These countries offer a more extensive and less costly labor supply and already have a broad industrial base and high export volume. Products that meet the above conditions, which are currently produced on Guam, include garments and watches.

Table II-10
MANUFACTURED GOODS EXPORTED TO THE UNITED STATES UNDER HEADNOTE 3(a)

Calendar Year	Watches & Bands		Garments		Total	
	Number of Firms	Value of Exports (\$000)	Number of Firms	Value of Exports (\$000)	Number of Firms	Value of Exports (\$000)
1972	6	1,569	0	0	6	1,569
1973	7	4,561	0	0	7	4,561
1974	7	4,892	4	3,553	11	8,445
1975	4	4,333	3	2,782	7	7,115
1976	5	1,270	5	1,340	10	2,610
1977	2	1,591	3	215	5	1,806

Source: Department of Commerce, Government of Guam.

By law, the President cannot designate an article eligible under the GSP if the article is within the following "import-sensitive" categories:

- . textile and apparel articles which are subject to textile agreements
- . watches
- . import-sensitive electronic articles
- . import-sensitive steel articles
- . certain footwear articles
- . import-sensitive semi-manufactured and manufactured glass products and
- . any other articles which the President determines to be import-sensitive.

These areas are eligible under Headnote 3(a) thereby giving Guam an advantage over the lower cost Asian countries.

Opportunities exist for industries to export Guam products under the Generalized System of Preferences to those countries awarding Guam special treatment. The

U.S., Australia, New Zealand, and the European Common Market include Guam under GSP provisions. Eligibility requirement for articles imported under GSP vary from country to country. Perhaps the most promising industries for Guam are those that can export both to the U.S. under Headnote 3(a) and to other countries under GSP provisions.

The restriction that caused a sharp reduction in the garment industry on Guam was the "substantial transformation" requirement. This requirement specifies that a new and different article of commerce must result from the operations performed in an insular possession and the interpretation of this clause by U.S. Customs agents caused a number of firms to cease operations. However, there is still potential for garment export from Guam, providing firms carefully follow U.S. Treasury guidelines.

The products are inspected at U.S. ports of entry, other than Guam, so that there is uncertainty for Guam manufacturers as to whether products will be accepted under Headnote 3(a). Problems will not arise if local manufacturers follow the administrative guidelines, being especially careful in shipments of new or different articles. More policing by local customs officials would also be helpful in avoiding costly errors.

Watches were once a significant export of Guam but the local industry declined due to the popularity of digital watches. Now that this popularity appears to be waning, the local watch industry could re-emerge.

American Samoa and the Virgin Islands also are included in the Headnote 3(a) program. American Samoa exports canned tuna, fish products, cat food, watches, and jewelry. The Virgin Islands exports watches, textiles, petroleum products

and chemicals, dyes and rum. Having a population of about the same size as Guam's, the Virgin Islands exported six times more watches and textiles than Guam in 1974 and 1975.

Guam does not qualify for preferential treatment in Japan and therefore is extremely limited in the number of items that can be exported to Japan. The best opportunity lies in attracting Japanese firms to locate on Guam, to take advantage of the unique location of the island. A fish cannery or transshipment operation may be such a possibility due to Guam's proximity to the source of supply. The imposition of 200-mile economic and fishery zones by much of the world has caused a 30 percent reduction in Japan's fish catch.

Transshipment and Warehousing

Transshipment and warehousing are becoming significant economic activities and there is potential for expansion. During FY 1975, 31,000 tons of goods were transshipped through Guam. This increased four-fold in FY 1976, to 128,000. The FY 1976 tonnage was exceeded during the first half of FY 1977 alone, when 144,000 tons were transshipped through the Commercial Port. Transshipment now accounts for 25 percent of the port's traffic.

The Guam Oil Refining Company (GORCO) imports and refines crude oil, and exports petroleum products to many points in the Western Pacific. The major petroleum companies transship refined petroleum products to nearby islands. Also, the U.S. military uses Guam as a storage and distribution center of petroleum products for the Western Pacific.

Transshipment activities capitalize on Guam's strategic location, as well as its well developed harbor facilities. Greater use of ships that now return near-empty to the mainland could distribute shipping costs between imports and exports, thereby lowering the cost of imported goods.

Apra Harbor is one of Guam's most valuable natural resources, and is an important asset in promoting the transshipment industry. It is one of the largest harbors in the Pacific and can handle many types of cargo ships. Presently the Commercial Port occupies only a small part of the Harbor and has serious space problems. Expansion of the Commercial Port area and greater efficiency in port operations must occur to eliminate the bottlenecks threatening the transshipment industry.

Fish from Palau are transshipped through Guam to the U.S. mainland. Last year, tuna transshipment provided \$250,000 in revenues for the Port. This figure would have been higher but for occasional turning-away of tuna boats because of an insufficient stock of refrigerated containers to off-load the tuna. Arrangements have been made to transship pineapples from the Philippines to the U.S. mainland via Guam using ships that have previously been returning from Guam to the U.S. empty.

Expanded warehousing facilities are necessary to support transshipment activities. Cargo shipped to Guam would be stored in these warehouses for shipment to other destinations around the Western Pacific as the goods are needed.

Objectives for Industrial Development

To guide the development of manufacturing and transshipment activities, the following objectives are recommended:

1. Promotion of clean, non-polluting light industries.

The preservation and enhancement of Guam's fragile environment is considered most essential to the continued development of Guam's tourism, an industry that appears to have the best potential for long-term growth. The selection and encouragement of light industries must complement the tourist industry.

2. Encourage the hiring and training of local labor.

Much of the benefit of light industry lies in the employment it creates. As long as substantial unemployment exists on Guam, the government should encourage firms to train local people to perform jobs now filled through off-island recruitment. Training of both skilled labor and middle-level management must be encouraged.

3. Provide infrastructure facilities that cannot be met by the private sector.

One of the most powerful inducements a territory can offer is adequate infrastructure. In industrial activities, basic infrastructural needs include power, sewage disposal, water, transportation and communication facilities, and planned commercial and industrial parks. The government, in cooperation with the private sector, must continue to improve infrastructural facilities.

Strategy for Industrial Development

1. Industry Studies

A project of identifying feasible new industries for Guam should be initiated. The purpose of the project would be to identify a number of industries which the government should actively recruit. The results of the studies would be made available to local entrepreneurs who would be given first opportunity to act on the recommendations. For those industries which appear feasible, but in which local investors show no interest, a recruitment campaign would be initiated to attract off-island investors. The project involves two stages: market surveys and feasibility studies.

- a. Market Surveys. Surveys must be taken to determine specific products that are consumed in sizable quantities on Guam. Three surveys are recommended.
- . A survey of military and civilian household expenditures
 - . A survey of military procurement and business and government supply needs
 - . A survey of tourists and visitor industry personnel to identify tourist purchasing preferences.
- b. Feasibility Studies. The usefulness of feasibility studies in stimulating new investment is becoming widely recognized. Full-scale feasibility studies are expensive and are usually done by or in conjunction with an interested firm. It is recommended that a series of "prefeasibility studies" be initiated by the government. This program should be continuous, studying several promising enterprises every year.

An analysis must be done of the major supply and demand variables affecting a firm's willingness to locate on Guam to ensure economic viability. In particular, the analysis must include, but not limited to, the following factors:

- . transportation facilities; whether materials and/or products require prompt and/or low cost movement
- . availability of tax incentive measures advantageous to industrial location in Guam
- . availability of appropriate labor skills required by the production process

- . availability of resource materials for production (production input)
- . marketing potential, both domestic and foreign
- . availability of land areas that are compatible with adjacent uses
- . effect of industry development upon environmental resources

2. Promotion and Recruitment of New Industries

Guam is a relatively unknown island and not usually thought of as a candidate for a manufacturing plant. The lack of knowledge of the advantages of locating on Guam points to the first task of a promotional campaign: presenting the right information to potential investors.

In addition to maintaining up-to-date promotional literature, there are three specific activities that should be undertaken:

- . development of a community profile with periodic updates
- . identification of potential industrial sites and development of site profile sheets
- . formulation of a well-defined promotional program which includes mailings, public relations and industrial relations in and off the island of Guam.

A direct solicitation approach to specific firms appears more effective than a general solicitation. However, in order to solicit directly, careful study and selection of industries is required. A major advantage of the direct approach is the immediate feedback that will allow Guam to continually reassess the incentives it offers and to discover problems that must be corrected if industries are to be attracted to the island.

Garment manufacturing and watch assembly are viable on Guam, with five firms currently manufacturing for both the export and local markets. An active program should be implemented to recruit firms in these industries to Guam.

3. Tax and Financial Incentives

Guam is a capital-poor region relying heavily on off-island investment. Investment in developing regions normally yields high rates of return. However, due to Guam's small population size, an economy heavily dependent on unstable military expenditures and a widely fluctuating flow of Japanese tourists, the risk factor is substantially higher than in developed regions. Incentive programs must be formulated to reduce risk elements, for example, through "risk sharing," of government and private enterprise.

Tax incentives should be short-term rather than long-term. Long-term incentives are inefficient for two reasons: one, the incentives allocate resources and commit the government beyond a period that any reasonable forecasts can be made; two, the tax rebates and abatements given toward the end of a long-term commitment have little influence on the businessman's decision to invest for the above-stated reason.

Lacking is an effective system of prioritization of investment proposals. Depending on the rank in the priority list, prospective proposals should be given deliberate preferential treatment to achieve a given set of objectives. In all likelihood, the priority list will change as the development process is initiated.

At present, an incentive program does not exist for encouraging expansion of existing firms. Such a program should be instituted, with a distinction made between normal expansion, which need not be encouraged by incentives, and major expansion, for which incentives should be offered.

Efforts must be made to apply tax incentives in an equitable fashion and with a minimum of administrative delay. Once a system of prioritization of investment proposals has been established, it may prove desirable to make a formal statement of incentive policies, detailing which incentives will be allowed for certain types of industries. The advantage of this system is that potential investors have a much greater certainty as to the incentives they qualify for and are therefore in a better position to appraise the economic viability of their proposed enterprises. The system would provide equitable treatment to like enterprises. Administration of the incentives approval process is simplified and approval can be quickly decided.

Under the Guam Development Fund Act of 1968, \$5 million was appropriated by the Federal government, upon approval of the Secretary of the Interior, to promote the economic development of Guam. Guam Economic Development Authority (GEDA) was designated as the implementing agency. The fund is to be used in direct loans as well as loan guarantees. As of June 30, 1977, \$4.0 million had been received by GEDA and nearly \$2.9 million had been approved in direct loans. Another \$1.2 million still remains to be committed and a further \$1.0 million is yet to be received from the Federal government.

The Omnibus Territories Act of 1977, has authorized another \$5 million in funds to be used by GEDA. Therefore, GEDA has a potential \$7.2 million to be used in loans and loan guarantees, not including additional funds generated through loan repayment, interest charges, and interest earned on Time Certificates of Deposit.

4. Government Supply Contracts

The government purchases a number of items off-island that could be produced on island at a competitive price if long-term contracts were offered for supply of these items. The contracts need to be long-term because in most cases a one-year contract would be insufficient to induce firms to establish manufacturing operations. Often, it is in the second or third year before a firm realizes its profit expectations. For example, multi-color printing is done off-island. If a firm could win a contract to do the government printing for several years, the firm may be able to set up the required operation.

The first step would involve either the Department of Administration or the Bureau of Budget and Management Research in formulating a list of related goods or services purchased off-island. Working with the agencies that purchase the related items, the coordinating agency would prepare bid specifications, involving quality, quantity and price conditions. Pre-bid conferences would be called to determine if the conditions could be met or if they need to be altered. Bids would then be solicited if it appears that local production is feasible.

The list of related goods and services should also be made available to the business community. Unsolicited proposals could then lead to a contract or a pre-bid conference.

The military, with its large procurement needs, should also be encouraged to establish similar procedures. A successful attempt by the Government of Guam could set a precedent.

5. Industrial Park Development

Areas designated and designed for centralized manufacturing activities are needed as Guam's economy develops. Such areas promote the efficiency and growth of the manufacturing industry and minimize government provision of infrastructural facilities.

The Guam Economic Development Authority has sponsored the development of three industrial/commercial parks. The Cabras Island Industrial Park, near the Commercial Port, consists of 33 acres. The park is fully occupied, as is the 16-acre Harmon Industrial Park. The Tamuning Industrial Park with 26 acres is not fully occupied. It is projected that there will be increased industrial development in the Harmon and Mongmong-Toto-Maite areas and in the Apra Harbor area when the Navy releases this land for civilian use.

There are additional lands on Cabras Island and on Dry Dock Island that could be developed into industrial parks. The development of industrial sites in Cabras Island and Dry Dock Island are dependent upon the relocation of the ammunition wharf. Prior to this relocation, surveying and additional planning will be needed. Construction of the parks could not begin until 1981 or later, when the Navy ammunition wharf has been shifted to Orote Point.

The Harmon area is advantageous for industrial use because of its close proximity to the large and growing population centers of Tamuning, Dededo and Yigo and the airport. Much of the land is an abandoned airfield and is highly suitable for light manufacturing plants. The problems in developing the area lie in the disarray of land ownership and lack of adequate easements or rights-of-way for roads and utilities.

Though the Harmon Industrial Park is naturally centralized, its unplanned development has resulted in poor traffic circulation. Throughways are not marked or maintained and often cross privately-owned properties. Many roads cannot be relocated due to existing development. However, in areas of potential expansion, new routes are planned and, where possible, existing traffic flow is modified. A detailed plan for the rational use of the Harmon area needs to be prepared.

6. Expansion of the Commercial Port

There is a need to expand the Commercial Port so that the transshipment and warehousing activities can be efficiently performed. Bottlenecks inhibiting development are common throughout the world in areas where port development does not keep pace with economic growth. Guam must insure that such port-related problems do not occur in the future.

Presently, the Commercial Port container yard is overcrowded, with containers stacked three and four high. This is a result of an increase from 8,000 containers per year to 50,000 containers over the past 10 years. It now takes 30 minutes to deliver a container to a truck. The cost of this delay as well as the cost of sophisticated container stacking equipment has been high.

The Guam Port Authority needs an additional 24 acres to accomplish the expansion of the container yard. The project involves relocating the existing highway to the north along the coast of Cabras Island, leveling the land, and installing proper fencing and lighting. Estimated project cost is \$5 million.

Over the longer term, additional wharf space will be needed. The Army Corps of Engineers is planning to dredge Piti Channel for future wharf expansion for the port. The Government of Guam should work with the Corps and try to schedule this dredging to correspond with the completion of the ammunition wharf at Orote Point.

7. Increasing Research and Development Activity

Opportunities for research and development exist, particularly in the fields of energy, marine sciences, and agriculture. Guam can attract research activities by emphasizing the island's unique characteristics and by capitalizing on existing institutions and facilities.

The Guam Power Authority and Guam Energy Office are examining the feasibility of an Ocean Thermal Energy Conversion (OTEC) plant to meet additional power needs. Guam has one of the best sites in the nation for such a plant, with deepwater thermal gradients lying close to the existing power complex at Cabras Island. A research and development proposal should be submitted to the Federal Department of Energy (DOE).

The high solar radiation on Guam makes the island a candidate for solar research. A federal DOE official in Honolulu has expressed interest in receiving a proposal from Guam. Guam should submit a strong bid for inclusion in DOE's second 5-year program of solar research.

The U.S. Navy and the U.S. Air Force carry out major research in climatology and meteorology on Guam. In conjunction with existing activities, participation in worldwide air quality and meteorological research is recommended.

In the area of marine science, there are possibilities for research and development of aquacultural species, fisheries research, and development and expansion of research in general marine sciences. The Marine Laboratory at the University of Guam is a major asset in attracting research and development (R&D) funds and the Aquatic and Wildlife Resources Division of the Department of Agriculture is increasing its capabilities in fisheries research and management.

The Federal government is stepping up its funding of research in tropical agriculture, with the prime beneficiary being the University of Hawaii's School of Agriculture. Guam should try to attract some of the R&D activity, especially in the study of tropical pests and diseases. Examples of potential projects are Melon Fly and Oriental Fruit Fly Control, Flame Tree Disease Control, Banana Disease Control, and Giant African Snail Control.

Implementation of the program for increasing R&D activities will be accomplished through the establishment of a Guam Research Institute, associated with the University of Guam. Core support for the Institute should be provided by the Government of Guam and expansion should be based on ability to attract outside R&D support. The Institute would be guided by a Board of Directors.

8. Program for Increasing U.S. Corporate Activity on Guam

Guam is in an excellent position to serve U.S. corporations with operations in the Pacific. It has good air transportation links to major Asian cities and with the completion of the telephone system reconstruction program will have first class internal and external communication facilities.

The cost of maintaining expatriate American personnel in Asian cities has been rapidly increasing in recent years. U.S. corporations typically give numerous allowances to their overseas employees in addition to a base salary. These allowances must be treated as taxable income under new tax reform laws. Most of these allowances are not necessary for personnel assigned to Guam since living conditions are similar to those on the U.S. mainland. Office space is less expensive on Guam than in some major cities of Asia.

All U.S. corporations with operations in the Western Pacific would be candidates to locate part of their activities on Guam. These activities include:

- . regional administrative headquarters
- . regional sales offices
- . accounting or data processing centers
- . distribution centers
- . logistic support or service centers for remote or special projects.

Firms with major construction and development projects in remote areas should be contacted. This would include petroleum firms involved in offshore drilling activity around Korea, the Philippines, and Indonesia with future possibilities in New Guinea. There are copper projects in New Guinea and Indonesia

and ocean-floor mining will become an important regional industry in the future. Some companies already have cycle programs where an employee spends a month or so at the production site and a month or so at his home base. Guam could be a home base for companies offering such programs.

A promotional program is needed to inform U.S. corporations of the advantages and cost savings that could be realized by locating some of their activities in Guam. The program should concentrate on business leaders at their mainland corporate headquarters, since these executives decide the location of their overseas operations.

Initially, a mailing program should be initiated to provide, through an attractive brochure, information on the advantages of Guam. If the response is highly favorable, the next step would be to send a trade mission to the corporate headquarters in the mainland. Detailed information on the availability and cost of labor, office space, utilities, communications, facilities and other information must be known to follow-up inquiries and for use in possible trade missions. Government and private sector leaders planning travel overseas should be used to promote the concept of Guam as a regional corporate center.

D. Agriculture

The base of Guam's economy consists primarily of trade and commerce, tourism, and the military sector. While there has been substantial growth in these areas, agriculture, as an important facet of the economy, has been neglected. As a result, Guam imports most of its food products. In view of continued inflation and a projected worldwide food shortage, the island's economic base must be expanded to include a viable agricultural industry.

Agriculture and fishing have been major sources of livelihood for Guamanians for centuries. Prior to World War II, the island of Guam was largely an agrarian society. The production of food was on a family-level subsistence basis. Following the war, however, the role of agriculture and fishing declined as a majority of the population was attracted to several newly emerging economic sectors including the government, the military, trade and commerce. Consequently, farm lands were neglected and the island quickly changed from an agricultural to a service-based economy.

A factor that restrained earlier efforts towards redevelopment of farming was the impact of two major typhoons (Karen and Olive), occurring in 1962 and 1963. These typhoons destroyed 80 percent of the island's physical assets, and practically eliminated agricultural activity. In 1975, a Green Revolution Program was initiated to promote increased agricultural development. Although Typhoon Pamela caused extensive damage to agricultural crops and support facilities on the island, through hard work and extensive efforts by farmers, many fields were again under production several months after the typhoon.

As shown on Table II-11, the importation of fruits and vegetables comprised 67.9 percent of the population's total consumption of these products in FY 1975. With the notable exception of eggs, imported foodstuffs constituted between 74 percent (fruits and vegetables) and 92 percent (poultry) of consumption. For import replacement, there is a large market for locally produced food.

In terms of employment, agriculture is now the smallest industry in the private sector. In March, 1977 agricultural employment totalled 147, only 53 of which were island residents.

In terms of income, agriculture contributed only \$1 million of the total \$607 million gross business receipts in FY 1976. Total production of agricultural products was estimated at \$3.6 million in 1975 with total imports of \$12.5 million.

Since attractive job opportunities exist within the other sectors of the economic community, local residents are not attracted to agriculture. Commercial farms, such as two of the islands largest poultry and swine producers, must import farm workers from the Philippines, Japan, and Korea. Consequently, expansion of existing agricultural enterprises is limited by the time consuming process of bringing in alien workers, or may be substantially reduced if such farm workers are prohibited entry by U.S. Immigration action.

Youth may be attracted to agricultural endeavors by introducing related subjects into elementary schools, emphasizing the basic sciences in high school, promoting the Community Career College, and further developing the undergraduate and graduate programs of the University towards the research and skills required by the industry. Specific job and skill training programs for adults and unemployed teenagers now interested in agriculture must be developed and implemented.

Table II-11
 PRODUCTION AND IMPORTATION
 OF FRUITS AND VEGETABLES IN POUNDS, FY 1970-1975
 (Parentheses Show Percentages)

Fiscal Year	Production	Imports	Total
1970	2,410,562 (27.5)	6,352,885 (72.5)	8,763,447
1971	1,819,924 (20.0)	7,279,700*(80.0)	9,099,600*
1972	2,504,308 (25.6)	7,261,974 (74.4)	9,766,282
1973	3,129,453 (28.0)	8,047,160*(72.0)	11,176,000*
1974	3,485,122 (30.0)	8,131,950*(70.0)	11,617,070*
1975	3,750,400 (32.1)	7,939,600 (67.9)	11,690,000

*Estimated figures.

Source: Guam Public Market Feasibility Study, Economic Research Center, Department of Commerce, Government of Guam, July 1977.

Table II-12
 LOCAL PRODUCTION, IMPORTS AND TOTAL CONSUMPTION
 OF MAJOR AGRICULTURAL PRODUCTS IN FY 1974

Commodity	Local Production		Imports		Total Consumption	
	Dollars (\$000)	%	Dollars (\$000)	%	Dollars (\$000)	%
Eggs	1,983	86	328	14	2,311	100
Fruits and Vegetables	798	26	2,304	74	3,103	100
Pork	563	22	1,963	78	2,526	100
Poultry	104	8	1,157	92	1,261	100
Fresh Fish	131	11	1,104	89	1,235	100
Beef	94	2	3,741	98	3,835	100
	<u>\$3,673</u>	<u>26</u>	<u>\$10,597</u>	<u>74</u>	<u>\$14,271</u>	<u>100</u>

Note: Import data by commodities is not available after FY 1974

Source: Growth Policy for Guam, Bureau of Planning, Government of Guam, May 1977, p. 28

Recognition of the various alternatives which can be applied to problems in agricultural development requires specific technical knowledge. In many cases, technology which has proven successful elsewhere is not applicable to Guam's unique setting. Research programs on better crop varieties, utilization of fertilizers, and insect and disease control, must be given higher priority. Research activities of the Agricultural Experiment Station and the Cooperative Extension Service of the University of Guam's College of Agriculture and Business are now directed toward these objectives.

Supporting a viable agricultural industry on Guam will require varying levels of capital depending on the nature of the project; the location of sites, size of operation, and applicable technology. Various projects, such as access roads, irrigation systems, an expanded central market, refrigeration facilities, and a cannery will support the island's agricultural development. Thorough cost/benefit studies are recommended preliminary to the funding of such projects.

Table II-13
POULTRY AND LIVESTOCK POPULATION: FY 1971-1977

Fiscal Year	Poultry (1,000 - dozens)	Eggs	Carabao	Cattle	Goats	Hogs	Horses
1971	107,150	1,859	322	4,450	982	6,699	136
1972	120,776	2,065	316	4,112	897	8,325	141
1973	133,235	2,265	298	3,986	785	8,619	132
1974	139,110	2,436	256	2,771	537	10,463	118
1975	142,537	2,499	259	2,502	492	11,726	126
1976	91,360	2,008	247	1,829	504	8,442	120
1977	95,928	2,108	235	1,647	455	10,130	123

Source: Statistical Abstract, No. 107, Vol. 7, 1976, Department of Commerce, Government of Guam.

General Resource Constraints

Much of Guam's land area is unsuitable for extensive agricultural development. Over the northern limestone plateau, the thin soil layer retains moisture poorly and dries quickly. Because of the underground aquifer in this area, the use of fertilizers and pesticides must be closely monitored. In the southern part of the island, sloping terrain, wetlands, and coastal areas further restrict agricultural production. Land areas of relatively fertile topsoil and level terrain are mostly found within the southern interior. The soils in this area can support certain crops with proper farming techniques.

Since rainfall is inconsistent throughout the year and the flow of southern rivers is undependable, farmers must utilize the island's water system for irrigation. Though one-third the commercial rate for water, the charge for irrigation water of 31.67 cents per thousand gallons (for the first 15,000 gallons) is a major expense for most farmers. For a successful large-scale agricultural industry, an extensive irrigation system and alternative water sources must be developed.

Land ownership on Guam is characterized by small land holdings, generally less than five acres. Large-scale farming will succeed only by consolidating small land holdings.

Fruit and Vegetable Production

Production of fruits and vegetables in greater quantities can be accomplished through expanded acreage and intensified use of land presently under cultivation. The communities of Yona, Talofofu, Inarajan, Merizo, and Umatac have an estimated 10,600 acres of arable land, of which over 5,000 acres are suitable for such production.

Crops recommended for expansion and their market requirements are listed in Table II-14. Cucumbers, watermelons, pole beans, and eggplant are not included because these items have demonstrated their suitability for cultivation.

Guam's climate is suitable for planting all year and production output can be increased by planting more often. A plan for staggering production would increase productivity without creating marketing surplus problems. Tree crops which take from one to twelve years to mature, such as bananas, papayas, tangerines and mangos should be increased through long-term planning.

To improve the distribution and marketing of fruits and vegetables, a processing plant and fumigation station have been proposed to the federal Economic Development Administration. There is a good possibility that funding for the construction of these support facilities will be approved.

Hydroponic Farming

Hydroponics has been successful on Guam in growing certain types of vegetables and ornamental plants. Before Typhoon Pamela, there were six hydroponic farms in operation on the island, estimated to be producing over 200,000 pounds of vegetables per year. Hydroponics utilizes the technique of growing plants with their roots immersed in a nutrient-laden water solution, under controlled temperature, humidity, and light. Planting is more easily staggered and harvesting can be spread out to accommodate part-time labor. Hydroponic operations include automatic watering and fertilizing which give it special applicability on Guam where labor is relatively expensive and soils are generally poor. Since these facilities suffered considerable damage due to the typhoon, hydroponic greenhouses should be constructed to withstand typhoon conditions.

Table II-14
CROPS RECOMMENDED FOR EXPANDED CULTIVATION

Districts And Crops	1974 Production		1974 Market Requirements		1983 Market Requirements	
	Acres	Pounds	Pounds	Acres	Acres	Pounds
A. NORTH						
Beans, K.W.	20.4	83,572	248,000	67.0		340,000
Radish	21.1	36,589	82,000	29.8		112,300
Sweet Potatoes	33.2	92,951	360,000	59.0		493,000
Tomatoes	112.2	278,397	936,000	223.7		1,281,000
B. SOUTH						
Bittermelon	48.4	146,566	280,000	65.3		383,500
Cantaloupes	67.9	169,239	722,000	108.7		986,000
Papayas	1,087+	118,524	366,000	3,825+		501,000
Pineapples	0.5	272	24,234	3.3		33,000
Zucchini						
Squash	N/A	N/A	56,000	37.0		68,500
C. NORTH & SOUTH						
Avocados	928+	89,137	358,000	2,900+		490,300
Bananas, eating	68.0	301,383	702,000	115.0		960,000
Cabbage, Chinese	79.0	200,559	442,000	107.7		602,500
Cabbage, Head	10.8	27,984	1,411,000	97.3		1,931,000
Corn	29.1	66,940	481,000	117.4		660,000
Onions, Green	31.7	62,865	376,000	122.0		515,000
Bell Peppers	39.6	86,435	211,000	76.2		288,000
Taro, Hawaiian and Wetland	32.6	89,745	347,500	205.2		469,800

*Based on 1974 DOA survey of food outlets on Guam.

+Trees

Source: Agricultural Development Plan, Bureau of Planning, Government of Guam, March 1978, p. 26

A hydroponic system costs between \$1.3 million and \$1.7 million per acre. The factors that most affect economic feasibility are:

- . cost of electrical energy
- . cost of capital and allowable amortization
- . availability and selling prices of premium grade salad vegetables
- . cost of transport of competitor products

Livestock Production

In 1975, Guam imported 66 percent of its pork, 90 percent of its chicken and 97 percent of its beef.

Pork has the greatest potential for increased production. Guam farmers raise swine mainly for use as roasting pigs for fiestas and other social occasions. The high price of pork in the market, and ability to use a variety of food scraps and locally-grown foodstuffs as feed are basic reasons why increased pork production is desirable. Greater production will lead to greater use of imported feed. Investigation is needed to determine whether root crops can be economically grown for use as ingredients in stock feed.

The production of beef has steadily decreased, from 290,000 pounds in 1969 to 116,000 pounds in 1975. Cattle grazing requires large tracts of land, which are generally unavailable or inaccessible. Thus, the beef industry does not appear capable of significant growth in the near future.

Guam's poultry industry is highly developed in the area of egg production. Self-sufficiency in eggs has already been achieved and eggs are even exported to neighboring islands. However, poultry meat is mainly imported. There is little potential for a commercial broiler industry at present. With a feed conversion

ratio of 3 to 1 (3 pounds of feed to produce 1 pound of meat) it is cheaper to import the meat rather than import the feed.

Duck raising has been a growing part of the island's agricultural production. Its increasing popularity is attributed to the growing number of Vietnamese and Filipinos on Guam. It is estimated that 83,300 dozen duck eggs are produced each year in the form of balut and salted eggs.

Goat production should be encouraged for a number of reasons. There is an estimated consumption need of 700,000 pounds per year. Compared with other livestock, goats can be raised with a minimum of care since they have a natural resistance to disease and thrive on submarginal land. Goats are easily bred, making them a favorable type of livestock from the standpoint of production quantity.

Strategy for Agricultural Development

1. Improve Agricultural Support Activities

- a. Farm Cooperative Study. A comprehensive analysis of the three existing farm cooperatives and their potential is necessary as a preliminary step toward encouraging the formation of similar organizations in the future. The present cooperatives need to be strengthened and their functions thoroughly examined, including membership structure, the range of existing services that they could provide, and the adequacy of their existing facilities.
- b. Agricultural Credit and Federal Assistance. The Farmers Small Loan Revolving Fund has a starting fund of \$250,000. Each farmer or fisherman is allowed a maximum loan of \$10,000 at 2 percent interest. The original capitalization of the revolving fund is insufficient and the Department of Agriculture should seek additional funding.

Only a few farmers currently utilize GEDA's Crop Insurance Program.

A reassessment of this program should be conducted to improve the situation. Guam should also investigate the benefits of having the following federal agencies and financial institutions extend services to the Territory:

1. Production Credit Associations
2. Farmers Cooperative Banks
3. Commodity Credit Associations
4. Federal Land Banks
5. Federal Crop Insurance
6. Farmer's Home Administration (programs available now are for rural housing and emergency typhoon rehabilitation loans).

In addition to the above, Guam has been made ineligible for funding assistance in a number of the agricultural laws.

- c. Comprehensive Soil Testing Program. To develop field farming, a comprehensive soil testing program has been initiated to determine the potential for growing certain crops in specific agricultural areas with different soil properties. Soil tests can yield information on fertilizer requirements and promote better management techniques to prevent soil erosion. A detailed mapping program must be initiated to identify potential and existing farm lands, and major crops that could be grown on such lands according to the results of the soil survey.
- d. Land-Use Reform. Most of the land for the Agricultural Land Lease Program is located over the northern aquifer. The underground water supply requires an open space area for protection from pollution.

There is a danger that fertilizers, pesticides and other pollutants may penetrate the limestone plateau and contaminate the major source of the island's fresh water. In view of the value of this natural resource, conservation of the water supply should take precedence over the land lease program. The program should only be encouraged in other areas on identified agricultural lands which have a greater potential for production than lands within the water conservation zone. In the south, the government's short-term Agricultural Land Lease Program should be discouraged in favor of the long-term lease program (P.L. 9-117) which guarantees sufficient time to make a substantial return on investment. With identification of prime agricultural lands in the Land-Use Plan, long-term leases can now be planned within agricultural districts.

The Guam Land Conservation Act should be amended to include a tax incentive program that will encourage the development of prime agricultural lands. Current real property taxes are low on Guam and do not encourage efficient utilization of land. Landowners can afford to leave their lands idle. A tax rebate should be given to landowners who keep their agricultural land in production. Higher taxes should be imposed on idle agricultural lands.

2. Program for Increased Production of Fruits and Vegetables

- a. Equipment Services. The Department of Agriculture should transfer the farm equipment services program to the private sector, such as non-profit cooperative associations now performing such service.

- b. Access Roads. There are large tracts of prime agricultural land lying idle because of insufficient access to the property. Much of the land is located within the interior, which offers protection from typhoons and is close to major rivers that provide needed irrigation water. Carefully planned roads in the interior from Route 4 and Route 17 would provide the needed access. The Government of Guam should construct the major access roads. Construction of minor access roads serving individual landowners should be the responsibility of the landowners with governmental review to ensure environmental protection.
- c. Irrigation Systems. The Army Corps of Engineers is studying the potential of an Ugum River reservoir which would provide irrigation water for an estimated 2,000 acres, in addition to supplying drinking water for Southern Guam. The project should be encouraged after review of feasibility studies and the provision of substantial funding from the Army Corps of Engineers.
- d. Agricultural Improvement Districts. Guam does not have the financial resources to simultaneously develop all of its agricultural land. Consideration should be given to creating Agricultural Improvement Districts within areas suitable for agriculture. These districts would consist of adjoining lands where owners are committed to increased production. Once an area has been designated as an Agricultural Improvement District, the land would be surveyed to provide a basis for planning required infrastructure, such as access roads and irrigation systems. Soils would be tested to determine crop suitability and fertilizer requirements. Funding for the plan would be identified and

obtained. Farmer's within the Improvement District would also be given priority in obtaining GEDA loans and tax incentives.

- e. Quarantine Protection. The success of field farming depends heavily on how well crops are protected against pest and disease infestation. The Oriental fruit fly has only recently been eliminated, and the melon fly is still present. The banana industry is combating the bunchy top disease. Federal assistance from the USDA's Animal and Plant Health Inspection Division (APHIS) must be secured to eradicate or control the melon fly and bunchy top disease.
- f. Recruitment of Hydroponic Operations. Considering the past success of hydroponic farming on Guam, such operations should be encouraged. Since some level of expertise has already been locally achieved, future hydroponic operations should largely be local enterprises. However, it may be necessary to recruit off-island investment due to the capital-intensive nature of this type of farming. The Guam Economic Development Authority should actively recruit more hydroponic farming firms. A feasibility study of all aspects of hydroponic operations should identify:
- . type of structure needed to withstand typhoons
 - . crops which can be more economically produced through hydroponic farming rather than conventional field farming
 - . minimum and maximum size of hydroponic operation that can be economically feasible
 - . potential export markets
 - . lands most suitable for hydroponic operations, including proximity to required infrastructure such as power, water and wastewater disposal systems.

3. Program for Expanded Production of Livestock

- a. Production of Local Feeds. Expanded production of the livestock industry depends on the ability to reduce feed costs. Large-scale commercial operations are dependent on costly imported feed. More research and trial production of local feed crops are needed. It is possible that at least the carbohydrate and/or protein components of the feed can be locally produced with importation of vitamin supplements. In the South Pacific the use of root crops has proven successful. Crops such as cassava are efficient converters of solar energy into carbohydrates and require little cultivation. Root crops also have a major advantage over surface crops in being less susceptible to typhoon damage.

Other minor feed components could also be locally produced. For example, powdered coral can be added to feed. If a tuna cannery is established, the by-product fish meal could be utilized as an important protein ingredient in animal feeds. Another possible protein source is tangantangan.

- b. Provision of a Slaughterhouse. Since Guam does not have a slaughterhouse, local meats cannot be legally sold on the market. A slaughterhouse can not exist without government subsidy, at least in the initial years, while farmers concentrate on increasing their production. The study should also determine the extent of the required subsidy and whether the benefits of increased production justify such expenditure.

3. Program for Improved Marketing and Distribution of Agricultural Products

a. Public Market. The new public market at the Paseo, although intended to be temporary, is of sufficient size to handle current production. There is a need to increase the quantity and quality of agricultural products sold at the market. These improvements can be met by:

- . a promotional program to publicize the market and attract more customers
- . an aggressive program to recruit more farmers to sell their produce through the market
- . improvements in product packaging, standards and merchandising methods
- . encouraging market prices which are competitive with those in commercial food outlets.

b. Crop Forecast Information System. There is a serious lack of statistics on the supply and demand for agricultural products. Currently, information on agricultural purchases and local production are mostly on an annual basis. The University of Guam's Agricultural Extension Service should establish a Crop Forecasting and Market Reporting Program. The information on the demand side should contain types of fruits and vegetables desired, volume of purchase, and estimated price.

The information on supply should contain the types of agricultural produce that can be expected in the market in forecasts of two weeks, a month, or other time intervals, depending on the crop. The estimated volume and prices will provide farmers with an indication of when oversupply situations can be expected so that a more even production of crops will result.

- c. Grading and Packaging. Standards for grade and packaging should be established by the Cooperative Extension Service and the Department of Agriculture for selected major commodities. Correspondingly, an educational program on size and quality grades should be initiated.

- d. Marketing Contracts. Greater use of market contracts should be encouraged, regardless of farmer membership in cooperatives. Assistance should be given in establishing marketing arrangements with the various outlets.

E. Fisheries

Guam depends heavily on imports to satisfy the island's demand for fish. In 1974, Guam consumed an estimated \$1,235,010 worth of fish, of which 89 percent were imported. Disregarding the fish consumed in the tourism sector, the current annual demand for fresh and frozen fish on Guam is approximately 2.2 million pounds. By 1980, it is expected that Guam will need approximately 5 million pounds of fish and fishery products to satisfy the needs of the resident population and visitors.

Traditionally, fish has been a staple food of the Filipino, Japanese, and Guamanian populations. The available fishery resources in Guam's waters are of high quality, and there has been an increased public interest in the nutritional content of fish products, resulting in a steadily increasing demand. Commercial fishing, if properly developed at competitive prices, can become a means of broadening the island's economic base. Presently, research, management, and development of fishery resources are in the pioneer stages. In recent years, there has been an upsurge of interest, investigation, and investment in mariculture and fishing activities on Guam. Several aquaculture, as well as offshore fishing enterprises, have been proposed. Others are well past the planning stage.

There are three operations that have great potential for the development of a viable fishing industry - production of cultured stock, harvesting of wildstock, and canning operations. The successful development of aquaculture depends on reasonable production costs, technological expertise, and availability of a suitable environment (especially of large quantities of unpolluted water).

Although the harvesting of wildstock has shown great potential, its success relies primarily on the availability of the resource in commercial quantity and the technology to economically harvest the resource. Development of large-scale commercial fish operations will require adequate transshipment, cold storage and related port facilities.

Fisheries development requires considerable technical knowledge. The capital investment for commercial fishing and aquaculture is comparable to hydroponic farming. In view of the capital requirements, complex technology, and risk in fisheries development projects, only experienced individuals or corporations who have had previous experience and success in fisheries will be interested in investing in this type of enterprise on Guam.

Guam's comparative advantage over the other islands lies in its convenient location together with its access to transportation and communication services. There are regularly scheduled shipping services to the mainland, as well as to other Pacific areas. Guam has daily flights to Japan and Honolulu and there are opportunities for expanding air routes. Air transportation is an important factor, especially in aquaculture operations which require importation of live larval stock and exportation of fresh produce.

Guam's political stability is a contributing factor to the viability of fisheries development. As a United States' territory, Guam is sufficiently stable to attract long-term investment. Additionally, the government's open investment policy, with tax rebates and exemptions, creates a favorable business environment for foreign investors. Guam's proximity to Japan places the island's fishing industry at an advantage, because the Japanese population consumes a great quantity of fish and fish products.

Demand for Seafood on Guam

In 1977, a study analyzed the factors influencing local consumption, or demand, for fish and fish products, and found:

- a. A significant portion of the surveyed households (34.4 percent) would like to make fish a more frequent part of their diet.
- b. The average current household consumption rate for fish and seafood products is 1.56 times per week; however, this rate varies extensively among households and between ethnic groups.
- c. The average current household expenditures on fish and seafood products is \$11.26 per week; however, this rate varies widely among households and between ethnic groups.
- d. A minimum estimate of annual household retail spending for all fish and seafood products on Guam is \$6.9 million, apportioned approximately 31 percent for canned, 26 percent for frozen, 36 percent for fresh, and 7 percent for dried and smoked fish products.
- e. The most frequently purchased canned fish product is tuna and the most frequently purchased frozen and fresh fish products are mackerel (atulai) and milkfish (bangus), respectively.
- f. Regarding frequency of consumption and total weekly spending on fish and seafood products, the Filipino population ranks first, followed by the Japanese and Guamanian populations, respectively.
- g. Both income and household size have a statistically significant and positive effect upon the total dollar value of household consumption of seafood.

Based upon the above findings, a current retail market exists for fresh and frozen fish in excess of \$7 million annually. Households would consume more fish if they

were conveniently available. The major constraint to retail market growth includes the inconsistent supply and high price of imported fish, rather than an insufficient demand.

An estimated \$7 million annual demand for fresh and frozen fish is considerably higher than previous estimates, however, based upon these local market sales, one must consider: the \$7 million is a current market estimate at retail prices and includes all middleman markups which are in excess of 100 percent; fish product sales are highly fragmented through many small enterprises; and the market for fish is highly segmented with respect to desired species. It appears that certain consumers favor one species of fish above others and this favoritism may not be easily overcome. Locally, the most profitable fish to catch is often the fish which is most abundant and therefore easiest to catch. However, a portion of Guam's fish market may always be captured by imports simply because some favored species such as milkfish are unavailable in Guam waters.

Table II-15
ESTIMATED CURRENT ANNUAL RETAIL VALUE OF
SEAFOOD AND FISH PRODUCTS CONSUMED BY
HOUSEHOLDS ON GUAM
(In Thousands of Dollars)

Fish Products	Estimated Retail Value*
Canned	\$2,614
Frozen	2,189
Fresh	3,023
Dried and Smoked	258
All Fish and Seafood Products	8,385

*Assuming 16,000 households, 89.5 percent of whom consume fish and seafood products.

Source: Some Factors Affecting Household Consumption of Seafood and Fish Products on Guam, Bureau of Planning, Government of Guam, March, 1978.

Harvesting of Wildstock

Surrounded by an ocean, Guam is a natural place for a major fishing industry. Historically, the Chamorros used the sea as a major source of food. As the island was colonized, fishing lost its importance as a way of life. With a continued Westernization process, consumer preferences changed as increased incomes made possible a greater abundance of imported items. High paying opportunities have attracted residents from traditional activities and fishing has become a part-time and recreational activity.

Fish production has been insignificant in recent years with periodic declines. Output peaked at 343,500 pounds in 1968, decreased to 144,000 pounds in 1972 and increased to 272,000 pounds in 1977.

The reef surrounding Guam contains a variety of fish which can be easily caught. Most fishermen use nets or fish traps inside the reef, but illegal poisons and explosives are occasionally used. Consequently, the reef is sometimes badly abused. Reef fishing is not expected to substantially increase.

The harvesting of wildstock outside the reef can be increased by two very different types of operation: a local-market oriented industry utilizing Guam fishermen and small fishing vessels, and a large-scale export-oriented tuna industry. A small local industry exists, composed of part-time and recreational fishermen. A capital-intensive industry, utilizing off-island labor and larger fishing vessels would fish the Western Pacific and use Guam as a transshipment center, or establish a tuna cannery.

The Fishery Conservation and Management Act created a fishery conservation zone for the waters within 200 miles of the United States and its territories. Tuna catches within the 200-mile zone are still allowed for foreign vessels. Other

types of fishing by foreign interests require permits under the provisions of the Act. A wide variety of fish exist within this zone, including tuna, wahoo, mackerel, dolphin (mahimahi), grouper, snappers, and marlin.

Table II-16
FISH CATCH AND VALUE: FY 1971-1976

Fiscal Year	Volume (Thousand lbs.)	Value (Thousand dollars)
1971	170	111
1972	144	93
1973	183	119
1974	201	131
1975	289	260
1976	208	187

Source: Statistical Abstract, No. 108, Vol. 7, 1976, Department of Commerce, Government of Guam.

Skipjack is the most abundant species of tuna in Guam waters and, due to technological problems, has been underutilized in the Western Pacific. Japan has been harvesting an average of 300 million pounds of skipjack per year from the Western Pacific. The Japanese employ the live-bait pole and line method of fishing, which requires large amount of live baitfish, presently not available on Guam.

Recent advancements in purse seining technology are certain to lead to greater harvesting of skipjack in the Western Pacific. Guam can benefit from this increased production by becoming a base for the large seiners, and processing and/or transshipping the skipjack to the United States. Skipjack is a migratory species and is available near Guam for approximately 6 months of the year. The availability of skipjack in Guam waters is not sufficient to support large seiners, although the seiners would certainly fish the waters in transit from Guam to more productive fishing areas, such as found near Palau and New Guinea.

Trolling is the technique currently used by Guam fisherman and is the most feasible type of tuna fishery specifically for Guam's waters. Trolling is economical on a small scale and several fishermen are currently making a living this way. With an upgraded fleet of small trolling boats, the commercial catch could be substantially increased.

Deep-bottom fish harvested in Guam waters include snappers, jacks, and groupers. This type of fishing utilizes a vertical drop line; fishing just off the bottom at depths of 180-900 feet. An estimated 10 fishing boats of less than 5 net tons could be supported by bottom fishing with an annual harvest of 400,000 pounds (Ikehara, 1975).

Juvenile mackerel are usually available in the shallow bays of Guam during July through November and are caught by using gill nets and hook and line. The schools of mackerel seasonally seek refuge in harbors, channels and bays. Adult mackerel can be caught at night all year in near-shore deep water. Mackerel fishing is capable of supporting 10 fishing boats under 5 net tons, producing an estimated 170,000 pounds per year (Ikehara, 1975).

Aquaculture

Aquaculture is the cultivation of seafood by the creation of an artificial environment for growth. Guam has an ideal climate for such activity with year-round warm temperatures that allow maximum growth. In addition to a local market, an export market to Japan and Hawaii, can be developed because some species, such as eels, command relatively high prices.

Limited land and water resources on Guam do not allow for broad diversification of cultured species. Guam should concentrate on a few species that have proven to be most profitable to culture.

The major land resources for aquaculture are located in the South. Pond culture requires land capable of retaining water, preferably with a minimum of 25 percent clay. The pond land should have access to water, and be accessible by vehicle throughout the year. At least 600 acres of land suitable for aquaculture has been identified. Other lands could be made available with sufficient water supply. Marine aquaculture should be limited to areas afforded protection from surf and storm damage, such as Apra Harbor and the Cocos lagoon.

Aquaculture operations are intensive users of water. The average daily quantity of water that needs to be added to a pond to maintain the water level totals 1.3

Table II-17
MARICULTURE ESTIMATIONS FOR GUAM

Organism	No. Acres	Estimated Productivity (Lbs. per acre)	Total Production (lbs.)	Price (per lb.)	Total Value
Shrimps	120	4,000	480,000	\$3.00	\$1,440,000
Catfish	120	8,000	960,000	1.00	960,000
Carps	120	8,000	960,000	.80	768,000
Tilapia	120	8,000	960,000	.80	768,000
Eels	30	25,000	750,000	2.50	1,500,000
Oysters	10	40,000	400,000	1.00	400,000
Mullet	10	3,000	30,000	1.00	30,000
Milkfish	20	3,000	60,000	1.00	60,000
Tuna Bait	50	10,000	500,000	2.00	1,000,000
			5,100,000		\$6,926,000

Source: The Mariculture Potential for Guam, and The Socio-Economic Impact of Modern Technology Upon a Developing Insular Region: Guam, Volume II, 1975, p. III. 94.

percent of the total volume. This water replaces that lost by evaporation and seepage. Large-scale development of pondage will necessitate the construction of reservoirs to assure an adequate water flow during the dry season. Without reservoirs, pond development must be based on the minimum flow during the year.

Earthen ponds are the oldest and most widespread means of containing cultured species. The present general trend is toward pond sizes of smaller than one hectare, which permits close management. The ponds are constructed by excavating the soil from the pond area to form dikes. The pond should be capable of complete drainage to facilitate the eradication of undesired species, control of diseases and mineralization of the bottom soil. Water entering the pond is splashed or sprayed to increase oxygen content.

The Floating Cage method of culture could be utilized on Guam. Cage culture uses an existing body of water (lake, river, ocean), where intense stocking in a confined area can be tolerated. Capital and operational expenses are less than those of earthen ponds; although life expectancy is less than that of a pond. Areas in Guam where cage culture could be practiced include Fena Lake, Apra Harbor, and Cocos Lagoon, although civilian access to the Navy-controlled Fena and Apra Harbor areas must be obtained.

Freshwater prawns were the first species to be grown on Guam and today they are commercially produced. Guam imports an estimated 500,000 pounds of shrimp per year, and this will increase with the growth of population and tourism.

Freshwater eels are commercially cultured on Guam. There are four concrete walled ponds in Inarajan and up to 12 additional ponds are planned. It is estimated that the farm will eventually produce 100 tons of eels per year. Juvenile eels are imported from Taiwan as stock. In January 1978, the first two tons of eels raised on Guam were shipped to Japan, which has an estimated demand of 40 tons per week.

Another pond operator is engaged in turtle culture. Export to Hawaii has begun and potential markets on the West Coast are being investigated.

Other freshwater species with applicability to Guam include catfish, carp, tilapia, and baitfish (for skipjack tuna). Species that could be cultured in brackish water and saltwater include milkfish, mullet, mangrove crab, oysters, mollusk, shrimp, rabbitfish, grouper, sea bass and snappers.

A constraint to aquaculture development results from high initial capital and technical knowledge required to derive maximum production of species. Like agricultural projects on Guam, a large amount of capital for the project and supporting infrastructure is necessary. There are numerous environmental and biological problems, requiring a high degree of technical expertise. Special training must be provided to educate those interested fish farmers who lack the essential technical knowledge.

Strategy for Fisheries Development

1. Program for Developing a Local Fishing Industry

The development of a local fishing industry can reverse the trend toward an increasing dependence on imported fish. Such a development will also prove beneficial to the tourist industry. A better supply of fresh fish for hotels and restaurants, and opportunities for sport fishing as a tourist activity will improve visitor satisfaction.

The organization of a Fishermen's Cooperative has been an important step in developing a local industry. The government should support the cooperative in developing and implementing plans for upgrading the fishing industry.

a. Regional Research. The National Marine Fisheries Service (NMFS) within the U.S. Department of Commerce, is involved in the Western Pacific through such activities as bait fish projects, training programs, economic studies, and fish location and attraction methods. The NMFS is utilizing an oceanographic vessel for preliminary study of marine resources within the Marianas region. The study will identify those marine resources within the 200-mile limit that merit further investigation. Results of the research will be evaluated by the Western Pacific Regional Council (WPRC), a group established in 1975 to oversee the ocean areas of the Western Pacific. The WPRC has identified three fishery resources - billfish, precious coral, and mineral resources - and will be developing a management plan for each of these resource groups.

The Food and Agriculture Organization (FAO) of the United Nations and South Pacific Commission (SPC) are also involved in regional fisheries research. The activities of the above organizations should be closely followed for use in managing Guam's resources.

b. Facilities. The two most important fishing centers are located within the Agana Boat Basin and Merizo. Fishing industry-related port facilities for these two areas must be developed, including a fuel pier at the Agana Boat Basin to eliminate the hazardous and time consuming process of hand fueling. Presently, fuel is brought into the harbor in 50 gallon drums by individual boaters. The tax revenues collected on boat fuel at the fuel pier should be reserved for maintenance of existing facilities, as well as for development of additional facilities for fishing boats.

Ice machines for crushed ice are needed at dockside. Immediate chilling of fish is extremely important. Boat lift facilities at marinas are needed to repair large boats and to allow fishermen to remove their boats during typhoon conditions.

- c. Improve Marketing. Guam needs a central facility for fishermen to market their catch, process orders, and meet buyers. The facility must contain cold storage and freezer facilities. Brine chilling systems can hold fish in a fresh condition for several days. There is a large cold storage facility on Cabras Island that is mostly unused. Use of this facility should be encouraged in periods of unusually large catches, with the frozen fish sold during periods of slack activity.

Efficient distribution of seafood products to potential buyers is essential for development of Guam's fishing industry. Currently, individual fisherman must search for buyers in order to market their catches. Market facilities at the Agana Boat Basin and Merizo piers would enable both the public and wholesale buyers to purchase catches at fair and consistent prices. A large demand for fish exists in the hotels, restaurants, food stores, schools, and hospitals.

2. Development of a Tuna Processing/Transshipment Industry

Several U.S. tuna firms have expressed interest in using Guam as a transshipment point or for location of a processing plant. Research of the resource supply indicates that a potential for expansion of skipjack tuna harvesting exists within the region. Presently, this species is substantially under-harvested. It is estimated that 100,000 tons of tuna are caught annually in the Western, Central and Southern Pacific region, mostly by foreign operators. The full potential for tuna harvesting is estimated at 800,000 to a million tons annually. As most of commercially exploitable

skipjack lie at considerable distances from Guam, this large-scale industry must depend on large, long-range boats.

Off-island investment and manpower will be needed to establish a large-scale commercial fishing venture. Guam does not have sufficient capital or the technical knowledge required for autonomous establishment of the industry. A joint venture with one or more U.S. canneries is recommended. Many of Guam's residents might not become commercial fishermen, as commercial tuna boats remain at sea for two to three month periods. However, should interest be shown by residents, a training program should be instituted.

Studies must be initiated to determine whether a transshipment operation or a fish processing and canning operation are feasible and desirable. A cannery offers the advantage of employing up to 300 people and stimulating the development of a number of secondary industries. The by-product, fish meal, can be used as an important ingredient in animal feeds or can be exported. However, a cannery can produce undesirable odors and consumes a large amount of fresh water, from 120,000 to 150,000 gallons per day. A medium-sized tuna cannery would require 10 to 12 acres of shoreline property and at least 800 feet of docking space. Such an operation could process 75 to 100 tons of tuna per day. This production level would necessitate cold storage facilities for 3,000 tons of fish. A 2-acre net repair yard would also be needed. Other support facilities would include an administration building and crew comfort facilities.

Past studies have indicated that Dry Dock Island is a potential location for a cannery and would not require extensive dredging or land filling. There is sufficient space in Dry Dock Island for the above facilities and for location of secondary industries that could be established to

service the cannery. Possible secondary industries include a can manufacturing plant, cold storage plant, warehousing, suppliers for the fishing boats, a net yard, and expansion of the ship repair industry. Further study is needed to assess the suitability of Dry Dock Island and investigate alternative locations.

Dry Dock Island is currently owned by the Navy and a transfer of this land to the Government of Guam would be necessary. It is unlikely that the Navy will release this land until the ammunition wharf is relocated, as it lies within the 2-mile hazard zone.

a. Support the Research of the Pacific Tuna Development Foundation (PTDF).

This foundation is engaged in tuna harvesting research in the Pacific with the objective of increasing fishing activities benefitting the United States and its territories. Research is focused on modifying purse seining techniques for use in the Western Pacific. The PTDF has been testing longer and faster sinking nets with success. In October 1977, one of PTDF boats using this technique off-loaded 730 tons caught in 2½ months.

Guam must be concerned with the resource potential of waters beyond the 200-mile limit, as well as within the territorial 3-mile limit. Commercial tuna boats can cover vast areas of the Pacific. For transshipment or processing of tuna, Guam can become a regional center, serving much of the Western Pacific. The continued active participation by the Government of Guam in the PTDF is desirable.

- b. Seek Exemption from Jones Act. According to provisions of the Jones Act, the purchase or use of foreign-made fishing boats, larger than 5 net tons is prohibited. These provisions limit the development of commercial fishing, since Guam does not build large fishing vessels, and the cost of U.S. made fishing boats is higher than that of foreign vessels. Current federal law prohibits Japanese, Korean or other foreign fleets to off-load tuna in U.S. ports. However, American Samoa, where Van Camp and Star Kist both have tuna operations, is exempt from this requirement. Guam should share this exemption.
- c. Recruit Off-Island Investment. Contact with the major tuna canners in the U.S. must be made. The plans of these firms must be known in order to optimally develop a cannery operation. The Guam Economic Development Authority and Department of Commerce should develop and maintain dialogues with interested canners. Where serious interest is shown, an agreement should be negotiated, detailing the type of investment envisioned and target dates for implementing the program. The possibility of a joint venture should be actively investigated as a means of increasing the economic benefits to the island.

3. Program for Development of the Aquaculture Industry

- a. Development Support and Extension Services. The Government of Guam, Division of Aquatic and Wildlife Resources monitors aquaculture projects on Guam. The initial phase of this program involved the investigation of feasible species for culture on Guam with experimental demonstration ponds located on the Talofofu River. The current phase consists of assisting in the establishment of commercial ponds with an extension service provided to the entrepreneurs. Studies on marketing

and distributional aspects of the industry should be completed in cooperation with the Department of Commerce.

Small farmers generally lack required expertise in various aspects of aquaculture, including such diverse elements as pond site selection, commercial feeding, and biological control. The extension service would provide this expertise.

- b. Supply of Initial Stock. Pond operators are faced with the scarcity of shrimp larvae and milkfish fry. The one source for shrimp is in Hawaii, where the State Fish and Game Department can only supply enough larvae to stock 12 acres of ponds per year. The Department of Agriculture's rearing tank for the production of larval giant Malaysian prawns will assist operators in stocking ponds. However, this tank will not be able to supply enough larvae to stock the 45-50 acres of ponds required for current local consumption of an estimated 500,000 pounds of shrimp.

A hatchery must be developed on Guam and a temporary alternate source of juveniles found (e.g. Palau) to sustain existing farms and meet the demands of a growing industry.

The Philippines, as the only source of milkfish fry has banned export to corner the market on this highly developable species. The government should seek an agreement to import milkfish fry from the Philippines.

- c. Identification of Aquaculture Sites. The Bureau of Planning, in coordination with the Department of Agriculture has identified potential aquaculture sites. A project which would facilitate the development of the

aquaculture industry would be a more detailed study of potential aquaculture sites. For each site, the study would discuss pond capacities, proximity and access to infrastructure, soil characteristics, existing land use, ownership and zoning status, and the environmental protection requirements. Preparing such a document, and providing a basic guidebook to potential investors would assist in planned development of the industry.

- d. Financial Support. Because of the high risks involved, the commercial banks on Guam hesitate to finance aquaculture projects. The Guam Economic Development Fund operated by GEDA has sufficient funds to support numerous small farmers. GEDA should also assist in preparing applications for loans and tax incentives on cases where the farmers do not have the financial expertise.
- e. Marketing Cooperative. The establishment of cooperatives for aquaculture farmers should be encouraged to promote a supply of products to the local market and to facilitate exports. Export orders may require a consistent supply that an individual farmer could not meet, but which a group of farmers could. Cooperative marketing would lessen the amount of time the individual farmers would spend on marketing their products, providing additional time for production.

A P P E N D I C E S

APPENDIX A
SUMMARY OF MANPOWER PROGRAMS ON GUAM
1977

Program	Description	Funding Level	Number of Participants
1. Comprehensive Employment & Training Act (CETA)	CETA was passed by the U.S. Congress in December 1973 (Public Law 93-203). Presently, the Agency for Human Resources Development is designated the administration of the CETA.		
CETA contains:			
Title I	Provides classroom training, on-the-job training, work experience and other supportive services to the unemployed, underemployed and economically disadvantaged residents of Guam. The occupational training programs are mainly in the construction related and services related trades. The major thrust of the program will therefore be in addressing the need to have trained skilled laborers to offset the economic impact of alien laborers under the H-2 program.	FY '77 \$1,116,336	FY '77 615
Title II	Authorizes public service employment and manpower training programs for unemployed, underemployed and economically disadvantaged persons in the areas with substantial unemployment.	FY '77 \$ 257,083	FY '77 116
Title III	Provides summer employment programs to economically disadvantaged youths and who are between the ages of 14 to 21 years old. The training and subsidized employment include: classroom training, on-the-job training, public service employment, work experience, manpower services, and supportive services.	FY '78 \$1,025,084	FY '78 239
		FY '77 \$544,104	FY '77 238
		FY '78 INA	FY '78 INA

INA: Information Not Available.

APPENDIX A (Continued.)
 SUMMARY OF MANPOWER PROGRAMS ON GUAM
 1977

Program	Description	Funding Level	Number of Participants
Title VI	Authorizes additional public service jobs and training programs for unemployed, underemployed and economically disadvantaged persons and provide special provisions for programs in areas of excessively high unemployment.	FY '77 \$804,190	FY '77 60
		FY '78 \$4,060,427	FY '78 239
2. Youth Employment and Demonstration Projects Act (YEDPA)	YEDPA was signed by President Carter in 1977 to employ and increase the future employability of young persons, to help coordinate and improve existing career development, employment and training program, and to test different approaches in solving the employment problems of the youth.		
YEDPA contains four components; however, only three are available on Guam:			
Young Adult Conservation Corps	Has been administered by Guam Department of Agriculture for last 3 years. Emphasized the participation of youth in needed conservation work on our nations public lands. Provide unemployed youths between the ages of 16 to 23 with employment in plant and wildlife preservation, management, and improvement.	FY '78 \$500,000	FY '78 70
Youth Community Conservation & Improvement Projects (YCCIP)	Provides unemployed youth with employment in well supervised work on projects that produce tangible outputs and benefits to their home community.	FY '78 \$122,333	FY '78 INA

APPENDIX A (Continued.)
 SUMMARY OF MANPOWER PROGRAMS ON GUAM
 1977

Program	Description	Funding Level	Number of Participants
Youth Employment and Training Programs (YETP)	The purpose of YETP is to provide youths, predominantly low-income youths who have severe handicaps in obtaining employment with work and training opportunities that will enhance their job and caller prospects.	FY '78 \$323,580	FY '78 INA
3. Job Corp Program	Is involved only in placement, administered by Guam Department of Labor, all training programs conducted in Hawaii. The service provides to economically disadvantaged youth and high school dropout.	INA	FY '77 34 FY '78 INA
4. Employment Service (ES)	Guam's Department of Labor manages the program, ES foremost responsibility is the administration of a labor exchange operation for the employers and unemployed residents of Guam. Through this operation, the ES solicits job orders from employers in the community and strives to fill those orders with the most qualified applicants.	FY '77 \$194,041 FY '78 \$146,554	FY '77 3,406 FY '78 3,406
5. Senior Community Service Employment Program (SCSEP)	Administered by Department of Labor. Is the only program which employs economically disadvantaged older persons aged 55 and above, in part-time community service jobs. SCSEP projects operate in every State and territory authorized by Title IX of the older American Act. Program participants are employed about 20 hours a week at Senior citizens center, schools, hospitals, facilities for the handicapped, and in beautification, conservation and restoration projects, to name a few.	FY '77 \$84,000 FY '78 \$287,000	FY '77 17 FY '78 78

APPENDIX A (Continued.)
 SUMMARY OF MANPOWER PROGRAMS ON GUAM
 1977

Program	Description	Funding Level	Number of Participants
6. Work Incentive Program (WIN)	Authorized by the Social Security Amendment of 1967 and 1971, is a federally funded program especially designed to assist recipients of Aid to Families with Dependent Children (AFDC) become productive workers. WIN is administered jointly by the Department of Labor and the Department of Public Health and Social Services. The program activities include institutional training, on-the-job training, and public service employment.	FY '77 \$231,296	FY '77 325
		FY '78 \$295,919	FY '78 325
7. The Apprenticeship and Training Programs	Promulgated by Public Law 7-147 in 1964, was placed under the auspices of the Guam Contractors Association and is administered jointly by the U.S. Bureau of Apprenticeship and Training and the Guam Apprenticeship and Training Programs, Guam Department of Labor. Today, it is referred to as the Bureau of Apprenticeship and Training. Here men and women are given the opportunity to participate in various skilled trades utilizing professional instructions and on-the-job practical experience. The main objective is to provide employees of the private sector with ready resources of trained journeymen and at the same time reduce the influx of alien workers. While the government implements program and administrative guidance throughout the apprenticeship program, the employers provide the training and salary requirements.	FY '77 \$34,485	FY '77 INA
		FY '78 \$37,961	FY '78 78

APPENDIX A (Continued.)
 SUMMARY OF MANPOWER PROGRAMS ON GUAM
 1977

Program	Description	Funding Level	Number of Participants
8. U.S. Naval Apprentice Program	Sponsored by the U.S. Navy at its Ship Repair Facility. This program provides training in trades such as welding, carpentry, electronics, and pipe fitting.	FY '77 INA	
<p>The following two programs are under the administration of Department of Education.</p>			
9. Adult Basic Education Program	Provides free programs of Adult Education to all persons 16 years or older including handicapped and physically disabled whose inability to obtain or maintain employment is not commensurate with actual abilities. Major emphasis is placed on literary skills which will increase opportunities for initial or higher employment and help those seeking help to become more responsible, satisfied, and productive citizens. Adult Education offers classroom training, guidance, counseling and testing service.	FY '77 \$245,851	FY '77 1,000
10. Vocational Education Program	Provides educational programs which are directly related to the preparation of individuals for paid or unpaid employment, or for additional preparation for a career requiring less than a baccalaureate degree. The program offers such services as in-service-training, curriculum development, career planning and guidance, and entry level skill training to secondary students.	FY '78 \$228,623	FY '78 1,200
		FY '77 \$2,200,000	FY '77 1,600
		FY '78 \$2,534,000	FY '78 2,000

APPENDIX A (Continued.)
 SUMMARY OF MANPOWER PROGRAMS ON GUAM
 1977

Program	Description	Funding Level	Number of Participants
11. Vocational Rehabilitation Program	<p>Provides a combination of services as needed to physically or mentally handicapped persons to prepare them for employment and productive, useful living. The Department of Vocational Rehabilitation is responsible for the implementation of the Vocational Rehabilitation Program, as contained in Titles I, II, and III of Public Law 93-112, the Rehabilitation Act of 1973, as amended. This program provides such services as requiring tools, equipment, and licenses for those physically or mentally handicapped persons interested in working in a suitable place of employment or in establishing a small business operation. This program also provides on-the-job training, and manpower services designed to develop occupational skills of the physically and mentally disabled.</p>	FY '77 \$1,290,938	FY '77 689
		FY '78 \$1,259,265	FY '78 575

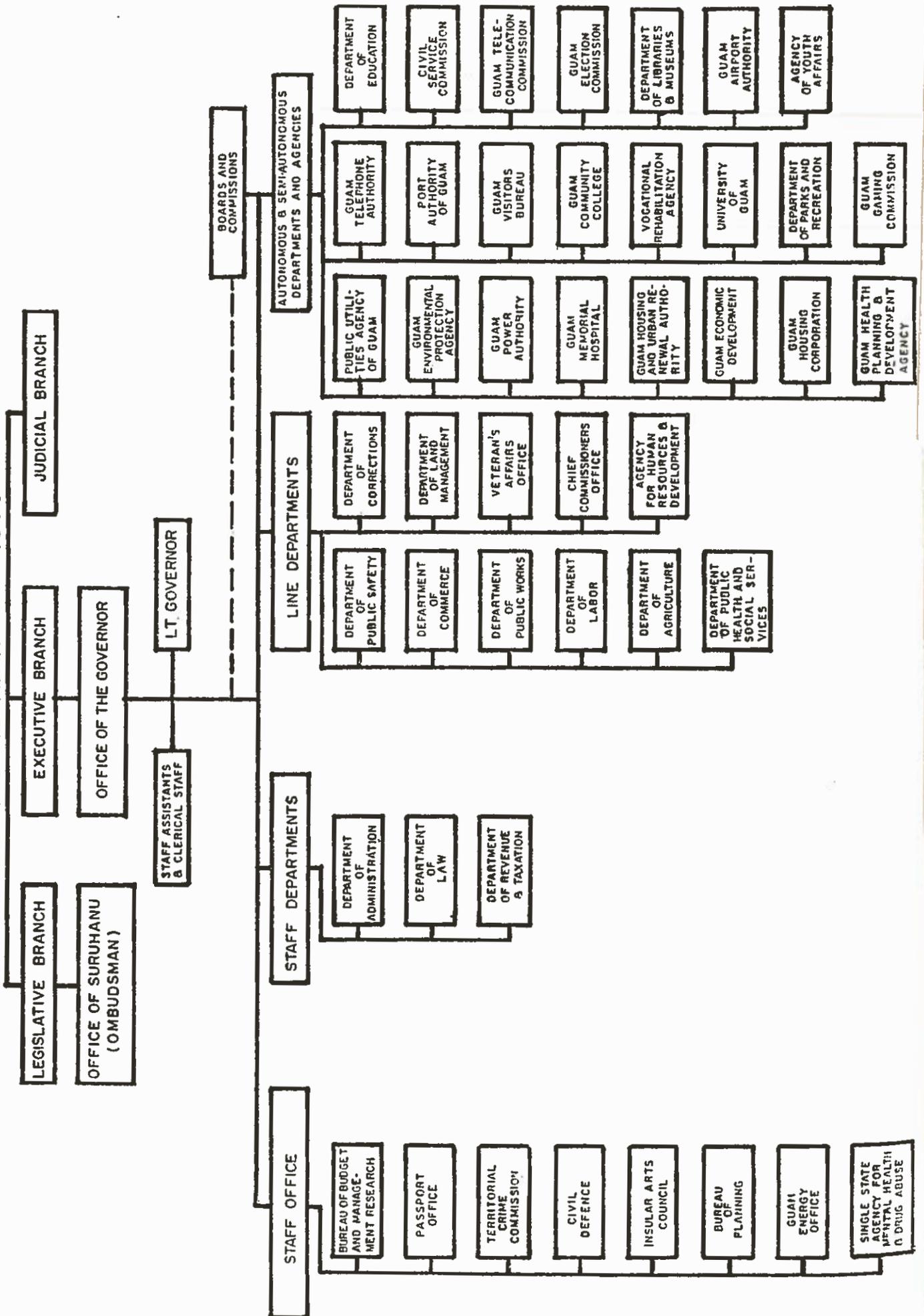
Appendix B
LIST OF FEDERAL AGENCIES ON GUAM

Attorney, U.S.
Civil Service Commission, U.S. and Federal Job Information Center
Corps of Engineers
Clerk, District Court of Guam
District Court of Guam
Department of Labor, Alien Certification
Department of Labor, U.S. Occupational Safety and Health Program
Department of Housing and Urban Development
Drug Enforcement Administration
Federal Bureau of Investigation
Farmers Home Administration, District Office
Farmers Home Administration, County Office
Federal Comptroller for Guam/TTPI
Federal Highway Administration
Food and Nutrition Service, USDA
General Services Administration
Immigration and Naturalization Service, U.S.
Internal Revenue Service, U.S.
Marshal, U.S.
Small Business Administration
Social Security Administration
Air Force Recruiting Station*
Army Recruiting Station*
Marine Corps Recruiting Office*
Navy Recruiting Office*

*These four recruiting offices are located at GCIC Building, Agana. All other federal agencies listed above are located at Pacific Daily News Building, Agana, Guam.

Source: General Services Administration.

GOVERNMENT OF GUAM ORGANIZATIONAL CHART FISCAL YEAR 1979



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