GROWTH POLICY FOR GUAM

BUREAU OF PLANNING
GOVERNMENT OF GUAM
AGANA, GUAM

Robin Grove

PRELIMINARY FOR REVIEW ONLY

GROWTH POLICY FOR GUAM

This planning study was accomplished under a grant from the Economic Development Administration. The statements, findings, conclusions, recommendations, and other data in this report are solely those of the Grantee and do not necessarily reflect the views of the Economic Development Administration.

PREPARED BY:
Bureau of Planning
Government of Guam

January 1977

TABLE OF CONTENT

		PAGE
I.	INTRODUCTION	1
II.	GROWTH POLICY	3
III.	SUMMARY	14
	APPENDIX: GROWTH ELEMENTS	
	A. Environment	17
	B. Culture and Life Styles	23
	C. Agriculture	28
	D. Tourism	48
	E. Light Industry	62

I. INTRODUCTION

Since the turn of the century, Guam's population has increased more than tenfold, from less than 9,700 in 1901 to 106,000 in 1975. The rate of population growth ranged from 12% to 40% per decade until 1940, when the rate accelerated rapidly, causing the population to quadruple in just 35 years. Recent population projections show that the number of people on Guam in the year 2,000, less than 25 years away, will be more than double the present level.

The population will grow, whether or not we prepare for it. This growth will strain certain fixed resources, such as our land and water. Uncontrolled, undirected growth can easily destroy Guam's culture and natural environment.

Moreover, many things will have to grow along with the population. The growth of our housing stock, our transportation and educational systems, and the economy must be well thought out and carefully planned to meet our needs. Job opportunities are becoming increasingly limited. The high unemployment rate on Guam indicates that immediate economic growth is a necessity.

The purpose of this Growth Policy is to identify the problems we will face and provide general guidance to government agencies to alleviate or avoid these problems. The document will be used as a basis for development plans, and allows the plans to be more specific in their approach.

This document is organized in the following way:

Section II presents an overview of the elements affected by the population growth and their Growth Policy Statements. Section III summarizes this Growth Policy.

The Appendix presents the Bureau of Planning's position papers which provides background reports and more detailed recommendations of five important growth elements: Environment, Culture and Lifestyle, Agriculture, Tourism, and Light Industry.

II. GROWTH POLICY

Land

Land is a fixed resource. The government will, on behalf of the people, try to ensure that the land is used wisely, and in a way which does not destroy the island's other natural resources. An urgently needed land use plan is being prepared. This plan will attempt to minimize the adverse impact of the various forms of land use (by performance standards) and rationally apportion the limited land available to Guam's needs by districting and zoning of critical areas.

Water

Guam's water supply limits the island's population and economic growth potential. The primary source of potable (drinkable) water is the limestone aquifier beneath Northern Guam. This groundwater supply, when completely developed and carefully managed, can provide, at most, 50 mgd (million gallons per day). If more than this amount is pumped from the water lens, salt water from the ocean will be drawn into the water supply and contaminate it.

Based on the amount of water now being consumed, the expected population growth, and the increasing per capita consumption of water, we will reach this amount (50mgd) around the year 2000. The use of desalinated ocean water will result in substantially increased water cost for the island's residents and hamper economic growth.

For these reasons, development projects which require relatively high volumes of water must be carefully assessed. Water conservation plans must be developed and implemented. Dams and other facilities which can tap the supply of surfacewater in southern Guam must be constructed to provide additional water supplies for commercial and industrial uses and irrigation waters for agriculture.

Environment

Rapid population and economic growth has already caused considerable environmental deterioration. Air, water, noise, and solid waste pollution are already detrimental to the health and well being of the island, its people, and its economy.

The major sources of air pollution on Guam are power plant and automobile emissions. As the island's population and income have increased, so have the demands for electric power and transportation. These demands are expected to increase at a rate even faster than the projected population growth. Fugitive dust, another type of air pollution, is well in excess of federal standards.

The disposal of solid wastes is becoming an increasing threat to the well-being of the population and the aesthetic qualities of Guam's land. In 1973, a survey conducted for the Department of Public Works counted nine thousand abandoned cars scattered through the island. The Guam Environmental Protection Agency (GEPA) estimates that we presently generate approximately 400,000 pounds of solid waste everyday.

Guam's water supply and coastal resources are threatened by pollution. Land grading and clearing activities cause the soil to erode and rainwater runoff carries these sediments into our waters, destroying underwater wildlife habitat. Local scientists have gathered evidence that the hot water outfalls of power plants have seriously disrupted the adjacent marine environment. Without strict control, toxic industrial and agricultural wastes (such as pesticides) may contaminate the groundwater supply. Improper sewage disposal systems of the increasing number of residents in Northern Guam, if left unchecked, will contaminate the water lens.

Some of our environmental problems are directly related to increasing population density, and others are a matter of destructive practices. The Government must fully support efforts to raise the public consciousness to these problems, develop alternative methods of waste disposal, strictly enforce air and water quality standards and regulations, and require thorough and detailed environmental impact statements on all major development projects.

Culture and Lifestyle

Since the second World War, Guam has been undergoing radical changes in the culture and lifestyle of its people. Agriculture, once a major source of income and livelihood, has all but disappeared in the last two decades. The influx of western civilization, which brought about changes in our society and the rapid development of the island's economy, has allowed and encouraged the people to make choices that involve the abandonment of traditional values. There is a growing concern that Guam is experiencing a "cultural indigestion," and the society, instead of showing signs of growth, shows signs of deterioration. Fear and miscontent, growing juvenile delinquency, an increasing atmosphere of crime and violence are a part and a symptom of the disintegration of traditional culture and social order.

In determining growth for Guam, it must be understood that growth is an on-going process, it must be an evolution rather than a revolution. The government of Guam must provide incentives and programs to orient the people toward reducing the rapid adoption of alien values and preservation of desirable culture and lifestyle.

The incentives include those which provide public assistance to families where the elderly are living with their children, to promote family ties. The programs include those vested in the educational system which emphasize the Chamorro culture and traditional values; those which promote the growth of agriculture to foster the attitudes towards the land as an intimate part of life; and the tourism activities that promote the island's culture and heritage, history, and social activities of cultural significance. Unless government efforts are directed now toward a deeper appreciation of one's past, the future Guamanian can look forward to an era of complete ignorance of his culture.

Housing and Transportation

Housing and transportation are areas where rapid growth must be dealt with to avoid severe dislocation and problems. See the Housing and Transportation Elements of the Master Plan.

Agriculture

The growth of agriculture is expected to reduce the importation of food and move the economy towards self-sufficiency. Agriculture also helps maintain open space, preserving the beauty of the island for the enjoyment of residents, and promoting a better physical environment for the growth of tourism.

The island's limited water supply and the economic feasibility of agricultural projects must be carefully considered in the government's agricultural development programs. In a free economy, an industry's survival depends on its ability to compete on its own economic merits; i.e., whether or not it is economically competitive to imports. Government supports, therefore, must be selective. Farmers who demonstrate the ability to independently compete

in the open market after an initial support period should receive more government encouragement and incentives, such as tax rebates, low interest loans, etc. Indiscriminate treatment of all potential farmers would create a new class of welfare recipients to be supported by taxpayers in more productive economic sectors. Recommended growth policies for four agricultural ~~options~~ elements follow:

1. Field Farming.
   a) Field farming is encouraged for two reasons: it provides an effective means of promoting open space and preserving the beauty of our island; and, it has proven successful for many island farmers.
   b) The construction of the Ugam River dam in southern Guam is urgently needed to provide necessary supplemental water for farming.
2. Hydroponics. This type of farming has several advantages;
   a) It can control the environmental factors and, therefore, reduce the risk elements that are due to Guam's weather;
   b) It does not require extensive use of good land, a limited resource on Guam. The government should initially encourage hydroponic farming on a limited scale and conduct research studies on the technical and economic feasibilities of hydroponic farming on Guam.
3. Commercial Fishing: There is little commercial fishing surrounding Guam despite the heavy demand for fresh and frozen fish. Since commercial fishing is labor intensive and the local cost is high, the government must carefully consider the ability of this industry to compete with imported fish products. For the on-going and future

experimental production of various fresh water species (such as shrimp and eel), more attention must be given to economic, rather than technical feasibility, per se.

4. Livestock. More research is required to determine the potential for producing livestock on Guam with particular emphasis on the production of poultry and swine. Given its limited land resources, commercial cattle raising is not one of the better alternatives uses of Guam's land.

Tourism

Tourism has proven to be a viable income and revenue producer. It is one of the few economic development alternatives which reinforces rather than abuses, Guam's natural beauty, when properly controlled and directed.

Four commitments are essential to the development of the tourist industry: a) to protect and enhance the environment especially in the resort areas such as Tumon Bay; b) to allocate sufficient resources to support the industry's growth, particularly with respect to the construction, maintenance, and improvement of facilities and related infrastructure; c) to reduce the number of crimes against tourists; and, d) to develop and conduct an intensive directed promotional campaign to attract those visitors who will provide greater financial benefits to the island. Specifically, the tourism growth plan must include:

1. A Development Plan for Tumon Bay Area

In order to formulate such a plan, the following investigations must be completed:

a) an inventory of existing facilities, resources, land use, land ownership in Tumon Bay;

b) a precise outline and cost of present infrastructure needs such as sidewalks, lighting and sewer, water and power lines;

c) an outline and cost of beautification projects; and,

d) an investigation of funding sources, including the local, federal governments, and the private investors' share.

While awaiting for the plan to materialize, the construction of sidewalks, additional streetlights, and if possible, adjacent bicycle paths along San Vitores Road should begin as soon as possible.

2. Construction of Tourist Attractions

This will largely depend on the availability of federal funds. However, with a favorable investment atmosphere and incentives, private organizations would be more inclined to contribute capital and financial resources to these projects. The construction of a Public Market which sells local agriculture products and souvenir items must receive a high priority. The market, which may be tailored after the International Market Place in Hawaii, can also be expanded to serve as a center for local cultural activities and gives the visitors an opportunity to meet and mix with local people.

3. Tourism Promotion Program

This includes: a) a program which aims at increasing the number of visitors to Guam, including means to control crime against tourists; b) a program which increases tourist expenditures on the island, and, c) a program which promotes the appreciation of tourism by Guam residents.

Program (a) of the above is being carried out by the Guam Visitors Bureau. Program (b) calls for a construction of the above mentioned public market and tourist attractions, as well as the development of an efficient public transportation system to allow the visitors an opportunity to increase

their on-island travelling and shopping activities. Program (c) is currently lacking. There should be public education efforts and stress that thousands of jobs and millions of dollars brought to Guam, directly or indirectly through the developers' investments in the tourist industry. The offering of high school and university courses in "Guam Economy" are necessary to accomplish this purpose. The news media can contribute a great deal to these efforts.

Barring any phenomenal increase in the number of visitors to Guam, the construction of major new tourist facilities and hotels should be concentrated in the Tumon area. While there are many attractions and tourism-related facilities in other areas of the island which should be maintained and improved, hotels should be concentrated in Tumon in order to; a) focus the management, financial, and planning resources of the Government; b) avoid the environmental degradation which would accompany concurrent development of multiple tourist areas and the transporting of tourist to every corner of the island; c) avoid widespread land speculation which would disrupt the life of the smaller, southern villages; and, d) avoid resentment of tourist "invasion" by local residents.

Light Industry

Light industries enjoyed a remarkable growth in the past ten years. With proper taxing policy and community support, this sector is expected to provide a major and stable source of income and employment for Guam in the decades ahead. Nearly all of the island's income today comes from two economic sources, military spending and tourism. The activities in these sectors change with the moods of the U.S. Congress, the President, and the Japanese economy; over which Guam has very little or no control. The promotion of light industries on Guam

will help establish a more diverse economic base, and alleviate the island's excessive dependence on military spending and tourism.

Those factors seriously hindering the development of light industries include the lack of supporting infrastructure, transshipment and warehousing facilities, and more important, an up-to-date publication concerning facts about doing business on Guam, and procedures for handling investment incentives.

Guam must undertake industry studies to determine the viability of specific industries on Guam. The studies must take into account the island's development objectives and environmental concerns to arrive at a list of manufacturing activities in order of priority. This is to be made available to potential investors together with an updated publication of information related to doing business on Guam.

Investment incentives are powerful tools to promote light industry. Some of the tools available to the Government include the lease of government land, the loan of government funds, and investment tax rebates. However, these have not been efficiently utilized.

The incentives should be short-term rather than long-term. The tax rebates and abatement given toward the end of a long-term commitment have little influence on the businessman's decision to invest since forecasts of profit or loss cannot be reliably made for the long-term.

Tax incentives alone are often inadequate to reduce the degree of risk associated with "venture capital" for new businesses. To encourage certain high priority industries to locate on Guam, the government should be prepared to assume some of the risks faced by the new companies by becoming a working partner with the industries (joint venture).

The education system must be re-examined and aimed at training local young men and women for the skills required by prospective industries. It is recommended that tax rebatements be developed to encourage the hiring of local labor, especially for personnel at the higher levels of management.

Other Income And Employment Bases

Other economic sectors which offer major potential for income and employment opportunities include the trade and commercial sectors, the federal and local governments.

Many types of trade and commercial activities can be expanded to absorb a substantial portion of Guam's future labor force. These include banking and financial services, wholesale, and retail trades. The expansion of these activities depends on the economic growth of the island and the improvement of Guam's infrastructure and communication systems.

The growth of retail trade depends on the growth of tourism, the island population, and income, while the growth of wholesale trade can be expanded substantially if transshipment and warehousing facilities improve. The possibility of Guam becoming a major financial center will increase as the island's economic condition shows promise. However, the island's infrastructure and public utilities must be improved to support this growth. Businesses, especially banking, can only survive on efficiency. Poorly operated and managed utility systems increase operating costs, reduce business profits, and can wipe out any possibility of increasing business activities on Guam.

On the other hand, Guam does have an advantage as being a part of America. America's political stability is an important factor for business growth; especially with the political deterioration in Thailand, Taiwan, South Korea, and the Philippines, and the high cost of living in Japan. Research efforts

are needed to determine factors responsible for increasing Guam's chance of becoming a financial and commercial center of the Pacific.

The U.S. and Territorial governments presently account for forty-seven percent (47%) of local jobs. In the future, the ability of the federal government to provide additional jobs depends primarily on the number of military personnel stationed on Guam, which is difficult to predict.

As population increases, there will be increasing demands for local government services; hence, Government of Guam employment is expected to increase. However, the increase will depend, to a large extent, on the government's tax revenues, which in turn, depend on the performance of the economic sectors whose growth policies plans are discussed above.

III. SUMMARY

In summary, the Bureau of Planning recommends that the following policies be adopted by the Government of Guam to ensure that concerted efforts by the public and private sectors be made in pursuing a common direction for Guam's future growth.

Land: To develop and implement a Land Use Plan to minimize the adverse impacts of the various forms of Land Use by rationally apportioning land among various uses.

Water: To protect and increase potable water resources by:

1. Assessing all development projects that require large amounts of water.
2. Developing water conservation plans.
3. Constructing facilities which tap surface water supplies.

Environment: To protect our natural environment by:

1. Raising the public's consciousness of environmental problems.
2. Developing alternative methods of waste disposals.
3. Strictly enforcing air and water quality standards and regulations.
4. Requiring Environmental Impact Statements for major development projects.

Culture and Lifestyle: To preserve the local culture and lifestyle by:

1. Finding means to reduce the rapid adoption of alien values.
2. Providing public assistance to families where elderly persons reside.
3. Encouraging stronger family ties.
4. Promoting and developing programs that foster attitudes toward land as an integral part of life.

Agriculture: To encourage the agriculture industry by:

1. Assisting those farmers who demonstrate the ability to compete in the open market.
2. Promoting field farming as a means of preserving open space and island beauty.
3. Constructing the Ugam River dam.
4. Encouraging hydroponics on a limited scale.
5. Investigating the ability of a local commercial fishing industry to compete with imported fish products.

6. Emphasizing economic as well as technical feasibility of fresh water species harvesting.
7. Researching the potential of poultry and swine production.
8. Reconsidering the feasibility of large scale cattle raising.

Tourism: To encourage the development of the tourism industry by:

1. Protecting and enhancing the environmental amenities of our resort areas.
2. Providing infrastructure and public facilities for tourist use.
3. Reducing crimes directed at tourists.
4. Conducting a promotional campaign to attract a particular type of tourist who provides greater financial benefits.
5. Developing a plan for Tumon Bay.
6. Initiating Capital Improvement Projects along San Vitores Roads.
7. Constructing a public market.
8. Initiating public education programs regarding the benefits of tourism.
9. Concentrating hotels and major resort facilities in the Tumon Bay area.

Light Industry: To encourage the development of light industries by:

1. Developing a list of manufacturing activities in order of priority.
2. Providing short term incentives to promote light industrial development.
3. Encouraging joint ventures by public and private organizations to enable the government to assume some of the economic risks.
4. Assessing the manpower and training needs of light industries and developing programs to train local residents.
5. Encouraging the hiring of local labor.

These policies provide the framework within which Guam will continue to grow and develop. Further, they intend to promote the role of Guam in becoming the financial and commercial center of the Pacific while simultaneously conserving the cultural and environmental amenities which contribute to this role.

APPENDIX: GROWTH ELEMENTS

A. ENVIRONMENT*

I. INTRODUCTION

As Guam continues to experience rapid economic and population growth, the environmental quality of the island gradually deteriorates. This deterioration can be easily seen in the air and noise pollution which is already a part of everyday life, in the soil erosion resulting from the grading and clearing of land, and in the pollution of Guam's rivers and ocean. This section, in its entirety, concerns itself with the extent of environmental deterioration on the island with emphasis on air, land, and water pollution.

II. QUALITY OF THE AIR ENVIRONMENT

In assessing the quality of the air on the island, one must first take inventory on those pollutants responsible for the gradual deterioration of the environment. The Guam Environmental Protection Agency (GEPA) identified emissions from motor vehicles and power plants as the two major sources of air pollution. However, it will not be long before other sources develop as a result of rapid growth and urbanization on the island.

Automotive emissions, nationwide, is the number one polluter. Unless dependency on the automobile lessens, and man detaches himself economically and culturally from the automobile, there can be no guarantee on having cleaner air.

---

*The data presented in this section was primarily based on GEPA's 1975 Annual Report and interviews with GEPA's staff.

The Department of Revenue and Taxation has registered for the fiscal year 1975, a total of 60,000 licensed motor vehicles. Within a 10 year period (1965 - 1975) the number of registered vehicles has more than tripled. This trend is expected to increase unless another mode of transportation, such as mass transit, is developed.

The other source contributing to air pollution is power plant emissions. Although the rate of emission is not as rapid as that of vehicles, the effects of this increase constitutes significant degradation in the air quality. By increasing the efficiency of one or two power generating sources, the environment is spared, to a degree, from the harmful effects of plant emissions. A reduction in the overall use of energy should begin with individual home owners as they are found to be the largest consumers of electricity. As the use of electricity increases, a decrease in the air quality can be expected as a result of increased emissions from power plants.

III. QUALITY OF THE LAND ENVIRONMENT

Guam covers 210 square miles exclusive of the reef area. The northern plateau is composed of porous limestone (beneath which lies the water lens) while the southern part of the island is mainly volcanic. Most development can be found in the northern and central portions of the island because of the flatness of the land, whereas any clearing or grading in the south is susceptible to large amounts of runoff.

The disposal of solid waste posed minor problems until today. The problems, as they exist, may be attributed to an increase in the population along with an array on non-biodegradable products people purchase daily.

Today's population (estimated at 110,000) consumes a variety of products packaged in plastics, aluminum, and glass containers. The disposal of these containers poses a threat to the island's environment. This threat can be seen in the mounds of garbage accumulated daily at the public dumb.

GEPA estimates that the island generates approximately 400,000 pounds of solid waste each day. Environmentalists also project an 80% annual increase in solid waste disposal. These figures and the limited land space for disposal are of increasing importance in the handling of solid waste problems for a growing population.

Erosion, another environmental problem, is directly associated with the clearing and/or grading of land. The threat lies in the exposure of land by grading and clearing activities. These activities remove topsoil and leave land scars. Run-off as a result of clearing takes the soil into marine waters destroying the underwater wildlife habitat. Therefore, clearing and grading should be kept at a minimum not to only preserve whatever topsoil there is, but also to serve as a filter for water seepage into the lens.

IV. THE ISLAND'S WATER QUALITY

Most of the island's water supply comes from the northern water lens. For the year 1975 alone, the northern lens pumped 65% of 10 billion gallons of water for public consumption. The aquifer supplies Andersen AFB and over 93% of the civilian community with drinking water. The remainder is supplied by spring or river (surface water) resources.

Because water for the island's population is being supported by the northern lens, it is important to prevent bacterial contamination from entering the island's source of supply.

There are essentially four sources of contamination that can easily endanger the island's water quality. Human waste as a result of inadequate sewage disposal practices, waste related to agricultural activities, industrial waste, and lastly, over pumpage of wells, all pose a threat to the island's water supply. The northern lens shows no contamination, while southern water sources (surface water) shows contamination 25% of the time.

Agricultural and industrial wastes are serious potential polluters to the island's water supply. Toxic pesticides, among other wastes emitted from agricultural activities, is one of the most dangerous pollutants to the island's groundwater. Industrial wastes, on the other hand, are pollutants foreseen as a possible threat to water quality. These sources of pollution are anticipated as a result of the rapid development occurring on the island without strictly enforced environmental laws.

Contamination of the water lens is the most serious problem facing the island's only source of potable water. The major source of contamination is the three million gallons per day of improperly treated sewage of approximately 7,500 residents living directly over the northern water lens. Even if sewer connections are properly made, run-off from paved areas can seep into the lens causing contamination.

As the northern section of the island is subject to future development, it is important that the water quality be safeguarded against all sources of contamination. The protection of the water lens in northern Guam has important implications to the location of housing development, industrial, and agricultural sites.

V. CONCLUSION AND RECOMMENDATIONS

Massive efforts must be directed towards reducing pollution on the island. Once these efforts burst into public consciousness, environmental concerns give rise to a host of demand for immediate and drastic action. These are then followed by crash programs launched to deal with the problem immediately. Misguided ideas are then proposed and hasty decisions are made which in turn are costly and detrimental to the environment.

As the island's population continues to grow, the environment is confronted with an array of problems as its resources are being gradually depleted. Therefore, in maintaining the island's environment, emphasis must be placed on the following:

A. Alternative methods of solid waste disposal should be researched as the island approaches its point of maximum capacity before causing major damage to its natural resources.

B. Government review closely the effects of emissions, waste disposal, stormwater runoff, and erosion to the environment on all proposed development whether they be private or government sponsored.

C. Air quality standards are strictly enforced as growth for the island foresees an increase in activities contributing to deterioration in its air quality.

D. Stricter controls are placed on the issuance of building permits in providing adequate construction of a sewage disposal system.

E. An environmental education campaign must be launched to emphasize the values of the island's natural resources and the danger of these resources being depleted.

Given the island's topographic characteristics, its size, and the location of its natural resources, it is imperative that critical areas in the environment be identified and that the government, as well as private individuals, adhere to policies relating to preservation of the island's quality environment. Protection of Guam's environment is urgently needed for the maintenance of a healthy and thriving tourist industry.

B. CULTURE AND LIFESTYLE

Little record remains of early Chamorro Culture, before the arrival of the Spaniards in 1521. The influence of exterior factors was significant and documented from 1521 onwards. Since that time, the island has seen administration by three nations: Spain, America, and Japan. Their presence led to the changes which, at the time, were considered good and necessary. These changes resulted in the integration of new cultural patterns.

Despite the influx of these new cultural patterns, some elements of the old culture were retained; such as the Chamorro language, ideas regarding the raising of children, and the household economy (with the family as the basic economic unit). Some of the newer patterns, a result of this cultural integration, include: the incorporation of parts of the Spanish vocabulary into the language; a village life centering around the church; the introduction of a wage-work economy along-side the subsistence agriculture economy; respect for authority; and the strengthening of social ties through fiestas and other social activities. Upon reviewing these new patterns, one pictures island life as being slow and easy-going.

This was to change at the end of World War II, when the reoccupation of the island by U.S. forces led to even more changes. Subsistence agriculture all but disappeared as the people set to work at the various military installations. The military acquired approximately one-third of the island. Village populations were relocated as residential areas were laid out by military engineers. Roadways and utilities were modernized. Along with these changes, the lifting of the security clearance requirement and the destructive

Typhoon Karen marked the beginning of a period of expansion that changed the face of the island. The lifting of the security clearance requirement brought foreign investors to the island. The devastation left by Typhoon Karen led to federal rehabilitation funds for the rebuilding and modernizing of the island facilities. The funding from these two sources marked a boom in the construction industry and vastly changed the physical appearance of the island. This change appeared almost overnight, allowing very little time for the people to grasp what had happened to their island and even less time for them to consider the consequences of the change. As a result of these events, there evolved modern Guamanian attitudes, formed by outside influences.

Modern Guamanian attitudes on government, education, technology, land ownership and family all appear to be patterned after Western ideas. Although the Vail Study, completed in 1975, surveyed the attitudes towards the above-mentioned institutions and found that Guamanians still place high values on religion, family life and land ownership, there is evidence that these values are weakening.

With regard to religion, although the island is still predominantly Catholic, it is the consensus that people are now less religious than they used to be. This indicates a loss of religious values that have been with the people for over 450 years. Guamanians still believe religion is important to them and continue to support the church; however, the emphasis on religion today leans more towards the social, rather than spiritual aspects of their faith. There is evidence that extended family ties are not as strong and close as they once were; for instance, the number of households having

extended family members is fast declining. Individuals now want separate family households, relieving them of the responsibility of caring for other family members. As this trend continues, there will be less dependence on the extended family members, a custom held by the people for centuries.

The deterioration of family ties may also be attributed to the family financial situation where both husband and wife are employed in order to pay off debts they have incurred purchasing homes and household appliances. In effect, the purchase of modern conveniences has led to the deterioration of family ties. It has now come to the point where individuals spend more time working to pay for these conveniences than spent with their family. Thus, another traditional cultural pattern, close family ties, is slipping away.

There is evidence that the cultural value of land ownership is weakening. Not more than ten years ago, many property owners began to sell their land to foreign investors. There are more properties being sold today as people wish to purchase the conveniences of the modern world.

In short, western culture, advanced technology and the rate at which development is occurring on the island have resulted in the island's loss of various traditional cultural patterns. As a result, the island finds itself faced with an ever-increasing crime rate, drug problems, and an increase in divorce cases.

CONCLUSION AND RECOMMENDATIONS

Changes in society and the island's economy have allowed the people to make choices which involve the abandonment of traditional values. When wage-type employment became available, the traditional household-oriented

agricultural economy was left behind and the family structure suffered. When modern conveniences became available, both husband and wife worked to pay for them and traditional practices of child-rearing suffered. When large amounts of money were offered to those who own the land, traditional attitudes towards land ownership suffered. When higher-paying wage-type jobe replaced the subsistence agricultural economy, the notion of individual wealth and responsibility was introduced and traditional attitudes towards extended family members and family responsibilities suffered.

The Government of Guam owns roughly one-quarter of the land and employs one-fourth of the labor force. The Government of Guam, through economic incentives and direct spending, partly controls the direction of the island's development. Through zoning and other land use controls, the government partly determines the role of land in the island's lifestyle.

Thus, the leadership of the island controls and determines, to a large extent, the sorts of choices available to the people. It is the responsibility of the leadership to orient these choices towards traditional lifestyle and culture. The recommendations are:

1. The curriculum in use in Guam's schools must be carefully edited and directed to reduce the infusion of alien values and to reinforce traditional cultural values. For instance, educational programs on the environment can be based on common ownership of natural resources; programs on drug abuse and addiction can stress the role and responsibility of family members; school work projects can be organized around groups, instead of individuals, to emphasize co-operation and accomodation as opposed to individual achievement.

2. The public assistance and tax systems must be directed towards providing extra support to multi-generational households; i.e., families where the elderly are living with their children.
3. The government promote the growth of agriculture since it fosters traditional attitudes towards the land as an intimate part of life.
4. Housing types must be selected for government financed projects which provide for common areas and the keeping of livestock among closely related families.
5. Guam's history and traditions are explored and presented as part of the tourism development plan.

C. AGRICULTURE*

I. INTRODUCTION

A. PROBLEM SETTING

Various proposals have been advanced to hasten the development of agriculture and fishing on Guam. However, no priorities for development have been clearly delineated for these sectors. The purpose of this section is to examine potentials and constraints and the economic feasibility of current programs for agriculture and fishing, with the objective of determining the viable alternative growth options.

Agriculture and fishing have been indigenous to Guam and have been major sources of livelihood for Guamanians. After World War II, the role of agriculture and fishing markedly declined as a greater portion of the population was attracted to higher paying and more prestigious military and civil service employment. In terms of employment, agriculture is now the smallest industry in the private sector, In March, 1975, agricultural employment numbered only 111, of which only 40.5% or 45 people were of local hire.

However, growth has been experienced in agriculture. The value of local agricultural products increased from $749,176 to $3,542,537 for the period 1964 to 1974, a 372 percent increase during a ten-year period. As shown on Table 1 below, importation of agricultural and fishery products constituted 74 percent of the total consumption needs of the population in 1974. The size of the agricultural and fishery market now filled by imports represents a demand that may possibly be met with local production.

---

*This section is a summarized version of the Bureau of Planning's "Agricultural Growth Policy," January 1977.

TABLE 1

1. Local Production, Imports and Total Consumption of Major Agricultural Products in FY 1974

Commodity	A Local Production		B Imports (Estimate)		C Total Consumption (A+B)	
	Dollars	%	Dollars	%	Dollars	%
Eggs	1,982,904	86	327,926	14	2,310,830	100
Fruits & Vegetables	798,065	26	2,304,490	74	3,102,555	100
Pork	563,200	22	1,962,684	78	2,525,884	100
Poultry	104,300	8	1,156,552	92	1,260,852	100
Fresh Fish	131,000	11	1,104,010	89	1,235,010	100
Beef	94,068	2	3,740,990	98	3,835,058	100
	$3,673,537	26	$10,596,652	74	$14,270,189	100

Source: Compiled by W. P. Leon Guerrero, R. Muniappan, J. T. Ishida, V. T. Artero, Trends in Agricultural Development in Guam and Micronesia, pp. 23-24.

II. AGRICULTURAL GROWTH ELEMENTS

There are several growth elements for Guam, including:

A) Field farming or conventional agriculture;

B) Hydroponic farming;

C) Mariculture;

D) Livestock farming.

These elements are expected to reduce the importation of certain products and help create viable industries for Guam. Although the elements will be treated separately, they can be combined in various ways to achieve certain objectives. However, each element must be feasible and competitive on its own basic economic merits, if it is to be a viable contributing industry in Guam. Government promotional support, tax breaks, incentives, loans, and protection to agricultural lands are tools that should be employed in assisting new enterprise that show excellent potential in competing with overseas imports.

A. Element 1: Field Farming or Conventional Agriculture

1. Potential. Field farming is a branch of agriculture that deals with the cultivation of the soil and the raising of food crops. In field farming, the raising of fresh vegetables and some fruits appear to show the greatest potential for development. Recent data indicate that only 20 percent of the fruits and vegetables consumed by Guamanians are locally produced. The amount of agricultural imports constitutes a good argument for agricultural development on Guam. Furthermore, field farming provides an effective means of promoting open space and preserving the beauty of our island.

The quality of local produce is beginning to be recognized as evidenced by a recent offer by the U.S. Navy to purchase on a contract basis 14 types of local vegetables and fruits totalling 229,380 pounts. If delivery schedules and quality standards are met, Guam's farmers can expect much larger orders in the future.

The College of Agriculture and Life Sciences (CALS) believes that corporate farming is more efficient than family or privately owned farming due to the economies of scale realize in operating large size farms. In this regard, available data indicate that in the southern half of Guam, lands in the municipalities of Yona, Talofofo, Inarajan, Merizo, and Umatac show considerable potential for a large scale agricultural development.

2. Constraints and Supportive Requirements

   a. Small-size farms. In 1974, the average size of a vegetable farm was 0.88 acre or 38,332 square feet. Smaller size farms in Guam are at a disadvantage in competing with the larger commercial farms due to the economies of scale generally realizable with larger size farm operations. Furthermore, the small producers are also at a disadvantage when competing for contracts since marketing contracts for fresh produce are generally made for bigger orders.

b. Soil. The quality of Guam's soils is not generally high. The soils are often stony, badly leached of plant nutrients, and low in organic matter. To help retain soil moisture and enhance nutrient status, organic matter in the form of manure, compost, or plant remains should be added to the soil. Commercial fertilizers with equal amounts of nitrogen, phosphorus and potassium are recommended.

c. Production, Distribution, and Marketing. The production, distribution, and marketing aspects of agriculture is chaotic, as is evidenced by frequent over-production occurring in the market. The scarcity of marketing contracts with supermarkets and stores, the lack of supply and demand data, and the smallness of Guam's market makes production planning extremely difficult. Whenever feasible, farmers should be encouraged to obtain contracts for a more orderly marketing of their produce. For the majority of farmers who have no contracts, current information should be made available on the forecasted supply, demand, and price of a number of agricultural commodities. The pooling of produce through a cooperative will also assist the small producers in marketing their crops more profitably. Guam presently has no central outlet for farmers to display their product. A well-designed and strategically located public market can help Guam's farmers in the sale of their crops.

d. Technology, Capital, And Infrastructure. The various ~~alternatives~~ elements that can be applied in agricultural development require specific technical knowledge to derive maximum economic yields. In many instances, technology applied elsewhere is not suitable to Guam's situation. Consequently, a great deal of time and money are normally required for research and testing before a technology applied elsewhere can be applied successfully to Guam. Supporting agricultural projects on Guam requires generally huge amounts of capital for the project itself and for supporting infrastructure. The projects require a thorough cost/benefit study in order to assist government planners in developing alternatives growth options for agriculture.

B. ~~Option~~ Element 2: Hydroponics

1. Potential

Hydroponics is the science of growing plants without soil under controlled temperature, humidity and light. In hydroponics, plants are grown with their roots immersed in a water solution containing necessary minerals or rooted in a sand medium kept moistened by such a solution.

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. One hydroponic farm reportedly experimented

with flower production and found the initial results encouraging. Using hydroponics, a wide variety of vegetables and florist crops can be grown satisfactorily. In fact, hydroponics may have special applicability in Guam where labor is relatively expensive, soils are generally poor, and land values are high. Principal advantages of hydroponics include (a) saving of labor by automatic watering and fertilizing; (b) production of crops when the outdoor supply is limited; (c) production of quality products commanding higher prices.

2. Constraints and Supportive Requirements. Except for "soil and physiography," all of the constraints discussed in Section II also apply to hydroponics, although perhaps in varying degrees.

a. Water Supply. The availability, adequacy, and purity of water is crucial in hydroponic operations. While irrigation water can possibly be utilized, it will have to meet certain standards and be regularly tested for purity.

b. Lack of Market Information. Forecasting of supply and demand of vegetable crops that can be grown by hydroponics is often hazardous due to the lack of reliable market data. Until up-to-date supply and demand data are made available, the hydroponic farmers must resort to the use of fixed contracts for a more orderly marketing of their produce.

c. Technology and Capital. A serious constraint to hydroponic farming is the high investment and technical know-how required for this type of business. While actual cost figures for running hydroponic farms are not available, it is generally known that a hydroponic farm requires a higher initial investment than conventional farming. Therefore, any decision to invest in hydroponic farms must carefully assess the total investment required.

A high degree of technology is necessary to operate a hydroponic farm successfully. Management must fully understand a wide range of technical matters and oftentimes should be able to conduct some research to solve day-to-day problems that crop up during operations.

d. Labor Requirements. Labor requirements for hydroponic farming is generally lower than regular crop farming. Since planting can be more easily staggered under hydroponics, harvesting can be spread out easily to accommodate part-time laborers. This system of harvesting has applicability in Guam where housewives are willing to work on a part-time basis.

C. ~~Option~~ Element 3: Mariculture

1. Potential. Mariculture is defined as the production of harvest of fish and shell fish, both cultured and wide-stock, from the marine as well as from brackish and fresh water habitats. The culture of useful aquatic animals and algae under controlled conditions that are

similar to the techniques applied in raising agricultural crops and animals is usually referred to as aquaculture. 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, $1,104,010 of which were imported and $131,000 locally produced. Disregarding the fish consumed in the tourism sector, the current annual demand for fresh and frozen fish on Guam approximates an order of 2.2 million pounds. With a local catch of no more than 0.2 million pounds (10 percent), and 0.8 million pounds of fish imported annually, an unmet demand balance of 1 million pounds remains.[1] By 1980, Guam will need approximately 5 million pounds of fish and fishery products to satisfy the needs of the resident population and visitors.[2] Thus, commercial fishing, if it can be developed on Guam at competitive prices, could become a means of broadening the island's economic base.

The harvest of wild stock of fish will likely be based on the exploitation of the skipjack tuna resource of Western Pacific and the harvest of deepwater snappers, groupers, jacks, mackerel, and possibly, yellow fin tuna. The availability of tuna and the technology to be used in harvesting the fish is presently being research. The Pacific Island Development Commission (made up of the Chief executives of Hawaii, Guam, American Samoa and the Trust Territory of the Pacific Islands) created the Pacific Tuna Development Foundation in order to develop tuna fishing in the Pacific.

---

[1]Overseas Bechtel, Inc., Guam Economic Development Master Plan, Preliminary Survey, Nov., 1977 pp.5-15 to 5-21.

[2]Isaac I. Ikehara, "The Mariculture Potential for Guam," The Social-Economic Impact of Modern Technology Upon a Developing Insular Region: Guam, II, P. III-83

Two modern U.S. purse seine fishing vessels recently arrived on Guam to begin testing and modifying the net fishing technique for the skipjack tuna resources of the Western Pacific.

Although tests by the University of Guam, College of Agriculture and Life Sciences have not yet been completed, the partial results indicate a potential for aquaculture production of various fresh or brackish water animals. Freshwater eels and prawns are presently grown on a limited scale in the southern part of the island.

2. Constraints and Supportive Requirements. The following factors have been identified as hindering the development of commercial fishing on Guam.

a. Infrastructure. Commercial operations require a large harbor area, where fishing vessels can easily enter and dock. The present port facilities at Apra Harbor are limited and expansion is necessary to accommodate commercial tuna fishing. Land will also be required for auxilliary facilities including a refrigeration plant, fuel storage, a canning factory, and other facilities.

b. Legal Restrictions. Currently, United States law prohibits Japanese, Korean or other foreign fleets in United States ports to off-load tuna. However, American Samoa, where Van Camp and Star Kist both have tuna operations, has been granted an exemption from this requirement. It is possible that Guam also shares this exemption.

c. Water. An ample supply of processing water is essential for tuna canning. According to a study prepared by the Planning Research Corporation, A Guam tuna cannery capable of processing 12,500 tons of tuna per annum would require 25 million gallons of water per year.[3]

To meet the cannery requirement, a greater amount of water has to be pumped due to water losses existing within the system. Assuming a 40% water loss, total pumpage needed is 35 million gallons of water per year to meet the cannery's requirement. This volume is equivalent to the yearly water consumption of 884 individuals based on an individual water consumption rate of 110 gallons per day. While fresh water requirements for a number of fresh or brackish water animals for Guam have not yet been determined, they are generally considered high users of fresh water. Expansion of the agricultural and fishery sectors of the economy must be evaluated in terms of their long-term impact on the supply of potable groundwater, keeping in mind projected water consumption and local population forecasts including tourists.

d. Bait Study. A ready supply of economic bait fish in commercial quantity is required for tuna fishing. Proximity to both live bait and the fishing grounds are important factors in the location of tuna operations.

---

[3]Planning Research Corporation, Economic Development of the Territory of Guam, Part 2, February, 1966, pp. 12-21

The availability of a bait fish supply to support a fisheries industry based on Guam needs to be investigated.

e. Manpower. Commercial fishing is seriously hampered by a lack of trained personnel and a lack of interest on the part of local young men to enter this trade. Rapid development of fishing may necessitate the importation of trained personnel. However, it is estimated that the size of labor force available in Guam could probably supply the workers needed for a major cannery in Guam.

f. Land Requirements. At least 600 acres of marginal lands with clay soil that lie adjacent to adequate surface water streams have been deemed suitable for aquaculture use on Guam. These lands are located in the central and southern areas of Guam.

g. Production and Marketing. As mentioned earlier, the outlook for a tuna operation on Guam is contingent on a number of factors, including the discovery of an abundant and economical supply of tuna in the areas around Guam. The availability of tuna is still being researched. Similarly, the production of cultured stocks is still under study. Preliminary findings indicate good potential for some animals. However, detailed production and cost studies are badly needed but are not yet available. With very little production on a commercial scale, there is little organized marketing of fish products on the island. With increased production, commercial fishermen may find a number of advantages in organizing themselves and marketing their produce through one organization.

h. Capital and Technology. Like hydroponics, mariculture requires a lot of technical knowledge in order to produce. The capital requirement for commercial fishing and aquaculture is higher than that required by hydroponic farming. In view of the capital requirements, complex technology, and risks in this type of business, it is probable that only qualified individuals or corporations who have previous experience and success in this business would be interested in investing in this type of venture on Guam.

i. Clarification of Legal Question Affecting Tuna Operations. To encourage potential investors, ruling should be obtained from the Federal government so that all doubt is removed regarding: (1) the ability of foreign fishing fleets to unload their catches on Guam; (2) the ability of a local operation to ship canned tuna directly to the United States on a duty-free basis.

D. ~~Option~~ Element 4: Livestock Production

1. Potential. Guam imports a large percentage of its domestic needs in meat. In 1971, island imports amounted to 1.7 million pounds ($900,000) of pork, 2.3 million pounds ($880,000) of poultry meat and 3.4 million pounds ($2,500,000) of beef. The domestic production of pork, poultry, and beef were 20%, 6%, and 5% respectively, of total consumption for that year.

Guam farmers raise swine mainly for use as "roasting" pigs. During "fiestas" and numerous social occasions throughout the year, "roasting" pigs are normally served. The five-year development plans of the Department of Agriculture calls for production by 1979 of 30,000 head of swine.

The poultry industry in Guam has developed rapidly in the last few years. Prior to Typhoon Pamela, Guam had 80 percent self-sufficiency in egg production. It is estimated that 60 percent of the laying flock on the island are replaceable and available for meat slaughtering annually. However, there is no broiler industry on island where chickens are raised primarily for meat production.

Increased production of domestic beef does not appear promising due to the large acreage required for cattle to become profitable--an annual carrying capacity equivalent to at least one animal per acre. Given its limited land resource, commercial cattle farming is not one of the better alternative uses of Guam's land.

2. Constraints and Supportive Requirements. Very little information is available on livestock production on Guam. Consequently, this paper will touch only those areas which have been discussed with a number of farmers on Guam.

a. High Cost of Feed. This appears to be a most serious problem facing swine and poultry producers on island. Since Guam is far away from the source of feed supply in the U.S., it is necessary for a poultry and swine producer to keep at least several months of feed to ensure a stable supply. The need to carry such a large inventory ties

down the farmer's working capital and raises his cost of operation. Furthermore, the high transportation cost of the feed to Guam adds substantially to the high cost of poultry and swine. Research on cost of raising swine at a lower cost must be accomplished.

b. Swine Slaughterhouse and Poultry Processing Plant.

These major capital improvement projects have been proposed as essential to encourage meat production on Guam. However, in the case of a poultry processing plant, it has been reported that "the Guam Economic Development Authority (GEDA) will seek to foreclose a loan to C & H Farm for $113,697.77 used in purchasing a poultry processing plant."[4] This unfortunate development points out the need for a thorough study on the feasibility of a poultry processing plant for Guam, before additional investment is made.

Broiler production is generally accomplished on a wide scale in the mainland, giving rise to certain economies. Guam must consider carefully her ability to compete in the broiler business before embarking on any capital assistance program to Guam's poultry farmer.

---

[4] Pacific Daily News, September 2, 1976

In the case of a swine slaughterhouse, there are no indications or studies to show that such a slaughterhouse can pay itself on Guam. A majority of pigs grown locally are reported slaughtered in individual homes where they are to be roasted. Thus, given Guam's unique market for pigs, the proposed slaughter house does not appear warranted. There may be potential for a slaughterhouse if piggery farmers become interested in raising swine for slaughter and processing into various pork products. Again, Guam's ability to compete with imported pork products must be studied before any action is taken regarding the proposed slaughterhouse.

c. Feasibility Study. A feasibility study for broiler and swine production should be undertaken in order to determine the viability of a commercial type of operation for Guam. The study should cover not only the production aspects but also the marketing and the distribution aspects of the business.

III. CONCLUSION AND RECOMMENDATIONS

Agriculture and fishing have been major sources of livelihood for Guamanians for centuries. The importance of agriculture, however, has been declining steadily since World War II due to the competition of several newly emerged economic sectors including trade and commerce, tourism, government, and the military. Governor Bordallo's agricultural development program and the "Green Revolution" movement have generated a great deal of interest in agriculture.

The growth of agriculture is expected to help reduce the importation of food, reduce the excessively high volume of imports over exports and move the economy towards self-sufficiency. An important advantage of promoting agriculture includes the maintenance of open space. This will not only help preserve the beauty of the island for the enjoyment of its citizens, but also promote a better physical environment for the growth of tourism.

There are, however, some important factors affecting the contribution of agriculture to the island economy that should be carefully considered.

One of the major constraints to the growth of agriculture, as well as other industries, is the limited water resources of Guam. Any increase in the water consumption rate will mean a smaller population the island water resource can support. Agricultural crops, therefore, should be encouraged only when the water requirement to maintain these crops is minimal

Another important consideration is the question of economic viability of agricultural industries. The present promotional supports to agriculture, such as tax breaks, low interest loans, reduced water rates, government insurance availability, etc., provides needed incentives. However, this type of government support must be given selectively to projects that show maximum economic potential and show capacity for competing independently in the open market. Judicious use of government incentives is expected to assist the development of a viable agriculture sector.

Four basic agriculture growth ~~options~~ elements were considered: field farming, hydroponics, mariculture and livestock.

1. Field farming deserves to receive government support for the following reasons:
   a. It provides an effective means of promoting open space and preserving the beauty of our island.
   b. It has been proven successfully for some island farmers, and is expected to assist in reducing Guam's dependence on imported foods.

Agricultural experts believe that the delivery of produce to markets according to the requested schedule is of primary importance. This is one of many factors that encourages local supermarkets to purchase Guam's produce and increase the demand for local products. Timely deliveries can be most effectively achieved by commercial farming where producers are well informed of the future market demand and are motivated by capital returns. Therefore, government policy must be directed to commercial types of farming to make the most efficient use of island resources.

It is recommended that the problem of water shortage be kept in mind since some types of crops require more water than others. This problem can be partly resolved by constructing the Ugan River dam in southern Guam. The dam, after construction, is expected to supply a new source of irrigation water for farmers at a moderate cost. However, since this project will require a substantial financial contribution by Government of Guam, a cost-benefit study must be conducted before the construction takes place.

2. Hydroponics has been tried successfully on Guam and appears promising in providing certain types of vegetables and florist crops.

Hydroponics is actually not in direct competition with field farming when hydroponic production is concentrated on crops that cannot be grown economically in field farming during the rainy season. Because of its ability to control environmental factors, hydroponic farming can also concentrate on high quality product that commands higher prices.

Hydroponic farming has special applicability on Guam where farm labor is scarce and relatively expensive. Furthermore, land requirements are generally less in hydroponics than in field farming. As land becomes more scarce and expensive on the island, hydroponic farming will assume a more important role.

It is recommended that the government encourage hydroponic farming on a limited scale initially and provide the industry technical assistance especially in the area of research and technology. Concurrently, the industry should be studied more closely in terms of the size of hydroponic farming that the island can support economically.

3. There is little, if any, commercial fishing going on in Guam despite the heavy demand for fresh and frozen fish. The harvesting of wild stock, especially the skipjack tuna in the Western Pacific, is being researched by the Federal government. While waiting for the results of the research, the various constraints applicable to a cannery operation must be carefully studied. Since the cost of labor on Guam is high, we will not likely be able to compete with other tuna cannaries that utilize lower cost labor. A tuna cannery in American Samoa reportedly has a lower labor cost than Guam's minimum wage. Another major constraint is the high water requirement of a cannery and the limited water supply on the island.

Any decision to allow a cannery operation on Guam must take into account its future impact on the drinking water supply of the island.

The production of various freshwater species like shrimp and eel is technically feasible. Experiments are presently underway to demonstrate that these species can be raised successfully under Guam's conditions. However, some sources have indicated that Guam's cost of production is too high. Thus, detailed production and cost studies must be conducted to determine whether these projects are economically viable. Attention should also be given to the project's water requirements, especially if the source of water in the future will be groundwater.

Government assistance in the form of pilot fresh-water farming projects should be continued. However, these project studies should cover not only the production side but also the marketing and distribution aspects of the business. For these businesses to succeed, they must be able to compete with imported fish products.

4. A feasibility study must be done to determine the potential for livestock production on Guam. The animals that show some promise for meat production are poultry (broilers) and swine. The viability of commercial broiler or swine farming must be demonstrated sufficiently to justify consideration for a swine slaughterhouse and poultry processing plant for Guam. Given its limited land resource, commercial cattle farming is not one of the better alternative uses of Guam's land.

D. TOURISM

I. INTRODUCTION

There had been very few visitors to Guam until 1961, when President Kennedy lifted the requirement of a security clearance for visitors to the island. This act signaled the beginning of activity in the tourist industry; plans and projects for developing a tourist industry were begun. In 1962 and 1963, two typhoons, Typhoon Karen and Typhoon Olive, devastated most of the island and virtually destroyed the newly developed tourist industry.

It took nearly five years to rehabilitate Guam from the ravages caused by the typhoons, By 1967, the island's economy was ready to concentrate on the development of tourism. The inaguration of the first direct scheduled flight between Guam and Japan on May 1, 1967 was considered the beginning of tourism on Guam. More flights followed. As a result, the number of tourist increased from 4,500 in 1967 to 260,568 in 1974, representing an average growth rate of 80 percent per year. The number of direct scheduled airline flights between Guam and Japan increased from two flights per week in 1967 to twenty in 1974, and the number of hotel rooms increased from 200 to over 2,500 over the same period. Prior to 1973, the growth of the visitor industry was only restricted by the availability of hotel rooms.

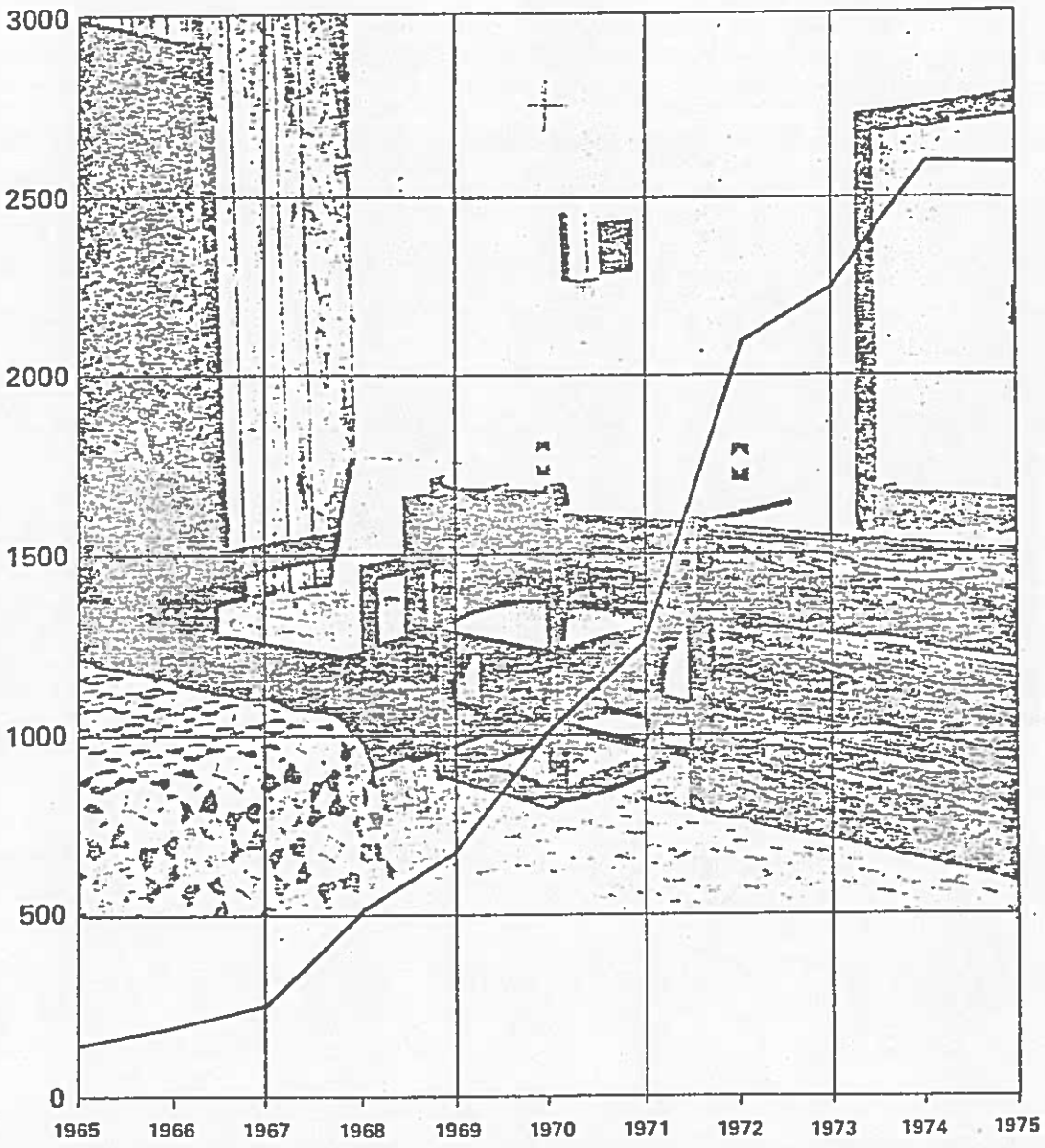
Similar to many other regions, Guam welcomes the growth of tourism for the following reasons:

A. It increases income and employment opportunities

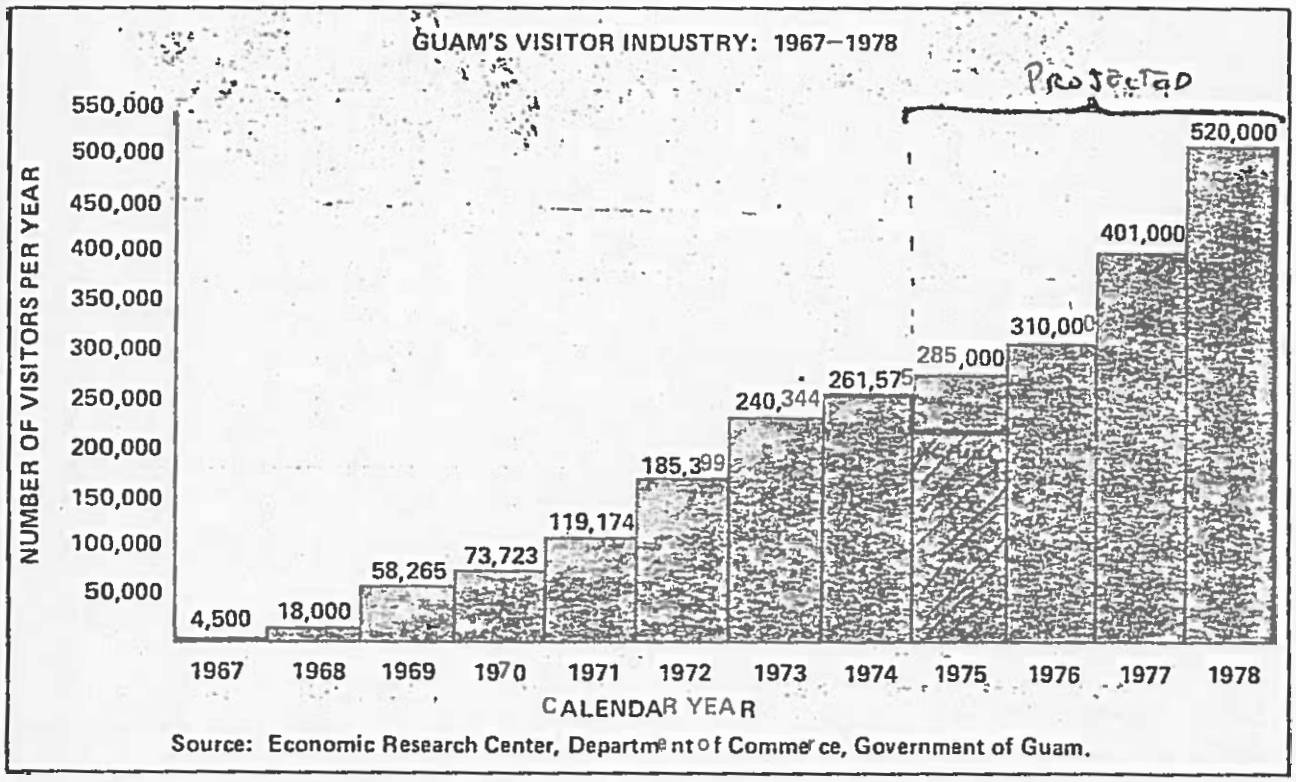
B. It creates market demand for local products

C. It creates a market for diversified and competitive service industries and small businesses

NUMBER OF HOTEL ROOMS



SOURCE: Economic Research Center, Department of Commerce.


GUAM'S VISITOR INDUSTRY: 1967–1978
PROJECTED
NUMBER OF VISITORS PER YEAR
550,000
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
4,500
18,000
58,265
73,723
119,174
185,399
240,344
261,575
285,000
310,000
401,000
520,000
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
CALENDAR YEAR
Source: Economic Research Center, Department of Commerce, Government of Guam.

D. It attracts additional foreign investment for the construction of tourist accommodations and related facilites

E. It is a minimally polluting industry considering the number of jobs it creates.

The industry has suffered a setback since 1975 as the flow of arriving visitors declined. Available data show the total number of visitors in the first six months of 1975 as 118,500 compared to 133,290 for 1974, an 11 percent decrease. Visitor statistics for the year 1976 remain stagnant.

The narrowness of Guam's tourism base contributed to the severity of the recent decline. Approximately 80 percent of Guam's tourists are from Japan. A majority of these visitors are honeymooners who came to Guam on pre-arranged packaged tours that include round-trip air fare, meals, lodging, sight-seeing, and some options for specialized activities. The worldwide recession and its impact on the Japanese economy resulted in the 1975-76 reduction in tourist arrivals. The reduction has also resulted from increasing competition for Japanese tourists from other areas, such as Hawaii, Hong Kong, and the Philippines.

The lack of tourist destination points is a major factor limiting the growth of tourism. Tourists generally like to tour scenic areas and enjoy light recreational pursuits. Opportunities for these activities are limited. The lack of sufficient public transportation facilities and concern about crime against tourists--some of which were sensationalized in Japanese newspapers--have also contributed to the decline of visitors to Guam.

II. POTENTIAL

Despite the current slump, tourism is an industry which possesses growth potential including:

A. The strategic location of Guam in the Pacific between Asia and America, and a part of America--will make Guam a unique place which no other country can match, as a tourist attraction and as a business/financial center.

B. Guam has opportunities for expanding air-routes. Potential airlines and routes include Quantas on a North-South route involving Tokyo-Guam-Sydney, China Airlines on a Taipei-Guam-Honolulu run, and Pan American on a Honolulu-Guam-Manila-Bangkok route. A Tokyo-Saipan-Guam connection is also likely and will, attract more tourists to this area.

C. Guam's political and social conditions are favorable factors for foreign investment. Guam has a history political stability. As an American territory for three quarters of a century, Guam is sufficiently stable to attract long-term investment.

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. In addition, the growing political instability of many Asian countries will be an important factor contributing to the possible growth of tourism on Guam.

D. Guam possesses outstanding natural beauty. The beaches and coral reefs, caves and waterfalls, overlook sites and natural jungles, the tropical trees and flowers are attractions par excellence for tourists in general, and Japanese tourists in particular.

E. Guam is an island attraction with its special history, language, and culture. Its distinct language and social customs are unique to this island in providing a lure for adventure tourists seeking an educational "field trip experience."

III. CONSTRAINTS

There are several important constraints that must be carefully considered before any policy related to tourism can be adopted; these include:

A. Resources. While tourism brings employment, income and tax revenues to Guam, it also competes for the use of the island's limited resources. The more land that is used for hotels and restaurants, the less land is available for other purposes, such as housing. Tourists also consume water and will aggrevate the shortage of potable water when the local population approaches its growth limit of 250,000 and the number of tourists is substantial.[1] Guam's environment is a precious natural resource. Uncontrolled growth of tourism yields effects similar to rapid population growth and may cause irreversible damage to the environment. For example, the storm drainage outfall near the hotels of Tumon Bay empty directly in the bay, causing increasing levels of pollution. Warnings against swimming and other water

---

[1]Assuming a tourist consumes the same amount of water per day as island resident; the average tourist stay in Guam for 4 days; therefore, will take 91 tourists to consume the same amount of water as a resident living on Guam all year round. Thus, if Guam has 910,000 tourist per year, the tourist will consume an amount of water equivalent to 10,000 residents. In addition, water is also needed for industries which provide services for tourists.

water contact sports have been issued. However, these environmental impacts can be lessened with positive programs to change current practices.

B. Infrastructure. Guam's present infrastructure is insufficient to support the growth of tourism. The lack of sidewalks, bikepaths, public parks, street lights, and a public transportation system has seriously limited tourist activities. Guam's telephone system adds undue hardships to hotels and tourist-related-activities.

C. Relatively High Cost of Visiting Guam

1. While airfares to Guam are strictly regulated by the Civil Aeronautics Board, the Guam Visitors' Bureau (GVB) reports that some of the airlines flying to competitive destinations, such as Hong Kong, Taiwan, korea, and the Philippines, have discounted their airfares by as much as 30 to 40 percent, causing a shift of potential visitors to these destinations.

2. The cost-of-living on Guam is high compared to Hong Kong, Taiwan, Korea, the Philippines, and other tourist destinations. A survey of the upper income, middle-aged Japanese conducted by GVB showed 38% thought Guam more expensive than Tokyo and "not one Japanese surveyed listed 'shopping' as a Guam attraction or activity."[2]

One of the primary causes of the island's high cost-of-living is Guam's small population base, which restricts business competition. In addition, the island relies almost totally on imports, and Guam's 3,700

---

[2]Guam Visitors' Bureau, Guam, USA Tourism News, April 2, 1976.

mile distance to Hawaii and a 6,000 mile distance to the U.S. west coast makes it very expensive to purchase commodities from the U.S.; a situation which is aggravated by the Jones Act.

D. Public Resistance. Lack of citizen participation and public understanding of the benefits of the tourist industry is one of the major constraints for the development of tourism. The tendency to "resist" development is natural for most developing areas where rapid cultural changes are occuring. Tourism, as a primary mover of the island's economy today is often seen as a catalyst in the development whose effects touch every aspect of the indigenous culture of the local people.

While economic development often brings about social and cultural changes, it is necessary to provide jobs for the increasing population and improve the people's standard of living. The negative aspects of tourism, however, can be reduced substantially by careful tourism development plans which emphasize the promotion of the Chamorro culture and island's history. It is also the role of the GVB and the news media to inform people of the benefits of tourism and how they can make use of this industry to make Guam a more enjoyable place in which to live.

III. CONCLUSION AND RECOMMENDATIONS

A. General Growth Objectives. The important key to managing the island's growth while maintaining a healthy economy is tourism. However, Guam's limited natural resources, and possible adverse effects on the island's culture and environment resulting from a rapid growth of tourism, call for the adoption of a "controlled growth policy" for tourism in the future. This growth must be directed so that the island economy does not depend excessively on just one industry. During this time of high employment, however, the government's efforts should be fully devoted to the

growth of tourism. The growth strategy must be compatible with Guam's overall development objectives which will be to establish Guam as an expanding gateway of importance to the Asia-Pacific area and a major destination point. Because of this, priority programs or categories of tourism development should be identified based on Guam's assets and conceptual framework developed for each program. The development plan for tourism should capitalized on those activities having outstanding potential for tourism and show how they can be developed and promoted to attract a maximum number of tourists, taking into consideration the constraints thereof.

In promoting the growth of the tourist industry, care must be taken to avoid the possibility of a divorce between tourist goals and resident goals. The first responsibility of tourism is to benefit residents. Whenever there is a choice between resident goals and tourist goals, resident goals must prevail.

B. Specific Growth and Development Objectives. The government should consider the cost and return of developing several principal tourism aspects to determine their priorities. These include the development of existing facilities in Tumon Bay, construction of tourist destinations including commercial tourist centers, vacation centers, resort communities, and development of general recreational facilities, including the Agana Boat Harbor, parks and historic sites, and special tourist industries.

1. Tumon Bay. In order to capitalize on existing tourist facilities in Tumon Bay, development of this area must be be given top priority. A land use master plan for this area 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. Work programs should include:

a. Inventory and analysis of existing facilities, resources, and land uses in Tumon Bay.

b. Relocation of appropriate complimentary land use and support facilities, and determination of priorities.

c. Analysis of infrastructure needs, including sewer, water, power, sidewalks, bikepaths, hiking trails, and an efficient public transportation system.

d. Determination of appropriate funding sources including private investors, local and federal governments.

e. Establishment of policies for effective implementation, including the establishment of strict zoning and land conservation.

2. Commercial Tourist Centers. The potential exists for the development of a major commercial tourist center on Guam. Since considerable facilities already exist and since Guam has a potential to become a business, transportation, and communication center, these assets should be used to attract conferences, conventions, and cultural affairs through a coordinated programs of promotion. Better utilization and promotion of existing multipurpose facilities can create and expand contacts with the international business community. The center would attract business persons, investors, and professional people and enhance the image of the island.

Further, the image of Guam as a pleasing place for "stop-over and shopping" and its Duty Free status can be promoted among trans-Pacific travelers. Efforts must be made to encourage business competition and to seek support in Washington to grant Guam an exemption from the Jones Act to reduce high cost of commodities on Guam.

3. Vacation Centers and Resort Communities. Only limited tourist accomodations have been developed in areas of Guam outside of Tumon Bay. Several major proposals for recreational vacation centers have been considered but none has been implemented. The development of these types of facilities would represent a major diversification, aimed at different segments of the Japanese and other markets, i.e., families and wealthier travelers. Guam's seashore and mountain areas and the extended season of temperate climate provide a highly favorable setting for recreational areas and vacation resorts. It is recommended that the feasibility of developing vacation centers for tourists be carefully analyzed. Potential sites for facilities should be selected based on land use plans as well as the results of the feasibility studies.

4. Recreational Facilities. In addition to physical accomodations, such as hotels, restaurants, and other facilities, additional recreational facilities must be developed. It is recommended that an analysis of the recreational needs of Guamanians, the United States military, and tourists be performed as a part of the Comprehensive Plan. The need for parks, marinas, historic

sites, and facilities should be reviewed. In addition to economic feasibility studies, a plan that identifies priority programs of immediate benefit should be created. This would assist in the creation of a coordinated and systematic development plan that achieves stated goals and objectives with minimum costly delays.

5. Special Tourist Industries. Tourist centers typically show a remarkable development of indirect tourism enterprises on production, trade, and services. Presently, there appears to be little incentive to supply auxiliary services and goods for tourist consumption. The development of a regional souvenir industry could utilize the indigenous skills of the populace, create additional income, and in a productive way, fill in seasonal gaps in the tourism industry and agriculture.

   Traditional and other local goods can be of great significance in attracting tourists. It is estimated that the purchase of souvenirs, local specialty items, and recreational items represents 10 to 25 percent of the total tourist expenditures. The sales of these products can be increased substantially with the construction of a public market that also provides entertainment and cultural activities. In developing handicraft and home industries, good design and technical skill are essential ingredients. Cooperatives could be an effective means for securing raw materials and for marketing finished products to maximize the benefits to individuals participating in the handicraft industries since the capital investment requirements are low and the labor content is relatively high. It should also be pointed out that expert assistance with respect to production problems

and the organization of marketing could be solicited or organized if a priority need in this area was established.

6. Cultural Co-mingling. A visitor to Guam has only a limited exposure to the ecology, culture, and history of the territory. There is a substantial need for better mixing of the tourist and local people. The creation of a botanical garden, acquarium or zoo that represents local species will certainly be informative and interesting to the visitor, insofar as the ecology of the island is concerned. Jungle-walks, coral reef/ride pool hikes will also have the same effect. Hence, opportunities must be provided the visitor for nature tours. Building a Territorial museum worthy of its name will be a remarkable step towards displaying and interpreting the history and culture of the island. Interpretive displays at significant sites such as Latte Stones, would be a notable undertaking towards the fulfillment of this goal. A Micronesian village resort center built in a secluded area with activities echoing the Micronesian life-style would serve both as an attraction as well as enlightment to the visitors. A "sound and light' program to the visitor, well designed to depict the history and culture of Guam will add to the variety of entertainment and learning. Since Guam today consists of several nationalities, cultures, life-styles, etc., an international cultural center (that may be combined with the public market) with international shops, cultural activities, ethnic stage performances and other such items of interest, would certainly emphasize the cosmopolitan aspects of Guam and its residents.

Tourism investments are typically capital intensive and their impact on the economy must be scrutinized very carefully. Foreign ownerships, management and staffing will result in a reduction of benefits to the economy through repatriation of earnings from capital, wages, and salaries. The multiplier effects, important for economic development is reduced if food and other goods sold to the tourists are imported. Care must be taken to see that the economic benefits are not outweighed by the social costs of rapid tourism development. Growth of tourism must be controlled, therefore, to allow the people of Guam to make proper social adjustments to prepare themselves to accept the challenges of growth and change.

E. LIGHT INDUSTRIES

I. INTRODUCTION

Industrial activities showed a significant rate of growth over the last decade. The manufacturing industry's share of total gross business receipts in Guam (GBR) increased from 3.2% (4.1 million) in 1965 to 19.2% ($117.1) million in 1975. This dramatic rise in manufacturing places the industry as the second biggest contributor to GBR in Guam for 1975. In the sixties, manufacturing in Guam was limited to the production of bakery products, dairy goods, ice products, soft drinks, watch assembly and local handicrafts. In the seventies, the manufacturing industry expanded rapidly 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 presently being manufactured on Guam are primarily serving local rather than export markets. The garment industry is a notable exception. The watch assembly industry and the brewery proved unsuccessful and are no longer operating.

The purpose of this chapter is to examine potential and supportive requirements of the manufacturing industry with the objective of improving existing investment incentive policy in Guam, particularly in the commercial and industrial sectors. Related industries like transshipment centers and warehousing will be discussed briefly.

II. OVERVIEW OF FACTORS CONSIDERED ESSENTIAL FOR THE DEVELOPMENT OF LIGHT INDUSTRY

A. Potential for Manufacturing and Assembly.

Although manufacturing has shown a remarkable growth in the seventies, it is difficult to forecast how much new investment will be made in the manufacturing field. The Guam Economic Development Authority (GEDA) has advertised in international magazines encouraging investment to Guam. A number of inquiries have been received to date, but it will be a while before we can find out if these advertisements will result in a significant increase in the number of new investments. Data are presently not available on any plans for expansion by existing manufacturing firms. However, it should be noted that four new firms have been recently granted qualifying certificates by GEDA to manufacturing and process garments for re-export to the mainland. This is an encouraging development considering the recent shut-down of a garment factory. In addition, a new kimchee factory has been granted a qualifying certificate by GEDA and is now in operation in Guam, thereby, resulting in the reduction of kimchee previously imported from Korea.

Many of the established manufacturing firms on Guam have received tax incentives in varying degrees from GEDA through the issuance of qualifying certificates. A qualifying certificate is an instrument valid for a given period of time issued by the Governor of Guam upon recommendation of the GEDA's Board to applicants engaged in agriculture, manufacturing, commercial fishing, services or improvement of real property. The purpose of the corporation must be determined to be beneficial, desirable and necessary to the economic development of Guam, and meet one or more of the following criteria:

1) Creation of new employment;

2) Replacement of imports;

3) Reduction of consumer prices;

4) Creation of vitally needed facilities.

Upon the Governor's approval, GEDA may grant a business firm any combination of the following benefits:

1) Abatement of real property taxes levied by the Government of Guam for a period up to 10 years;

2) Rebates of taxes on business income for a period up to 10 years, provided said income has been derived from the lease of land, buildings, machinery, and equipment;

3) Abatement of gross receipts tax on income derived from the sale of alcoholic beverages and of petroleum products manufactured in Guam for a period up to 10 years;

4) Rebates up to 75% of all corporate income tax payable to the Government of Guam for a period not exceeding 20 years, and up to 75% of all income tax on dividends paid by a corporate holder of the certificate for a period up to 5 years.

Another factor that helps attract manufacturing to Guam is the island's duty-free status and the fact that exports from Guam the U.S. are governed by favorable customs regulations. General Headnote 3(a), Tariff Schedules of the U.S., provides for free entry of manufactured articles which:

1) Do not contain foreign materials of more than 50% of their total value;

2) Come directly to the U.S. from Guam;

3) Are not prohibited by quota limitations.

This favorable tariff provision was a major incentive responsible for the establishment of garment manufacturers and processing plants on Guam.

B. Potential for Transshipment and Warehousing.

Transshipment and warehousing, presently limited on Guam, could become significant economic activities in the near future. Guam imports most of its commodity needs from the U.S. mainland but the amount exported is minimal. Consequently, the ships that come from the U.S. mainland usually return empty. This situation is inefficient and results in high freight costs to Guam. In order to alleviate this situation, Guam must explore ways and means of encouraging neighboring countries and island to utilize Guam as a transshipment center. There is now a limited amount of transshipment center going on between Guam and other Micronesian islands. Some frozen fish from other points in the Western Pacific are shipped to Guam, where they are then transhipped to the U.S. mainland. Arrangements have been made to transship pineapple from the Philippines to the mainland via Guam using ships that have been previously returning empty. While most transhipment activity is from Guam to the mainland, possibilities exist for transshipment to the orient. Developing trade with People's Republic of China could put Guam in a good position as a transshipment point and to perform such activities as assembly, bagging, and packaging.

Expanded warehousing functions are necessary to support the transshipment activities by allowing cargo to be shipped to Guam, where it could be stored and then sent on to other destinations around the Western Pacific as the goods were needed.

The island is almost equal in distance from many of the major population centers in the Western Pacific. In this regard, Apra Harbor is one of Guam's most valuable natural resources, and is an important asset in promoting and developing the transshipment industry. It is one of the largest harbors in the Pacific and can handle all types of cargo ships.

Unfortunately, only a small part of the harbor is available for public and private use. This creates serious space problems. It is absolutely vital to the transshipment and warehousing concept that sufficient space be acquired to allow these functions to be performed efficiently.[1]

III. SUPPORTIVE REQUIREMENTS

The following factors are considered most important in the development of light industry on Guam:

A. Industry Study:

A continual growth of light industry required an acceleration of the existing rate of industrial output and/or attraction of new industries to Guam. Except for the garment manufacturers which process garments mainly for re-exporting to the U.S., light industry on Guam is generally for local consumption. Given the limited size of the local market, the growth of existing manufacturing industries on Guam is basically restricted by the island's population. The small size of the local market also makes production on a large scale, that is usual in the major industrialized regions, unfeasible for many products. Thus, a detailed analysis must be done on all the supply and demand variables affecting a firm's willingness to locate on Guam to ensure its viability. In short, the analysis must include the following factors:

1. Transportation facilities; whether materials and/or products require prompt and/or low cost movements;
2. Availability of tax and incentive measures advantageous to industrial location in Guam;

---

[1]Overseas Bechtel, Inc., Guam Economic Development Master Plan, Preliminary Survey, November, 1975, pp. 5-5 to 5-6.

3. Availability of appropriate labor skills required by the production process;
4. Availability of intermediate input;
5. Marketing potential, both domestic and foreign;
6. Availability of amenities, housing and environmental factors;
7. Availability of appropriate plant sites; the Cabras Island Industrial Park and Harmon Field are considered suitable sites for manufacturing plants.

In brief, an in-dept study of a number of industries considered most promising and desirable for the island must be undertaken and fully utilized in the promotion of Guam. The availability of such studies is considered the most important tool in soliciting specific industries to locate in Guam.

B. Manpower Resources.

The availability of certain types of manpower skills is lacking on the island. According to a summary of the most-recent meeting of the Japan-Guam Economic Council, there are insufficient Guamanian workers who are "suited" for the skills and working conditions that are required by highly competitive manufacturing operations.[2]

An indication of this may be gleaned from the high percentage (presently 15.1% of non-immigrant aliens employed in the manufacturing industry (Table 2). The importation of alien workers into Guam has temporarily solved some problems arising from a labor shortage, but this is clearly an undesirable long-run solution, especially in view of the high unemployment presently being experienced by the island.[3] Furthermore, Guam's increasing population, which is projected to reach a number between 206,000 to 260,000 people by the turn

---

[2] Pacific Daily News, October 31, 1976
[3] Guam Annual Economic Review, 1975, p.38

of the century, will cause a multitude of problems if no long-range programs are devised now by the Government to provide the direction, incentive and encouragement needed to developed young people in the skills required for an increasingly complex and competitive economy. It must be recognized that the development of human resources is a long-term undertaking. Consequently, it is imperative that the Government determine now its long-term development goals, and develop educational, vocational, and training programs that are geared to meet both public and private demands, and allow maximum utilization of local manpower resources.

C. Investment Incentives.[4]

In Section II. A of this chapter, tax incentives granted to manufacturers by GEDA were mentioned. For this Section, certain other aspects of investment incentives will be discussed.

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 and an economy heavily dependent on unstable military expenditures and widely fluctuating flows 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," when the stake is large.

The investment incentives should be of short-term rather than long-term incentives. Long-term incentives are inefficient for two reasons: one, the incentives allocate resources and commit the government beyond a period any reasonable forecasts can be made; two, the tax rebates and abatements given

---

[4]This discussion presented in this section were primarily based on Working Paper #3 of the Guam Economic Development Committee.

It must be kept in mind that while the investment incentives are primarily of short-term nature, the potential long-term benefits in terms of employment and income generated alternative projects are of paramount importance, and should be carefully considered. Presently, a workable mechanism to evaluate potential long-term benefits against short-term incentives in light of the above criterion, is lacking. Also lacking is an effective system of prioritization of investment proposals. Depending of the ranks on 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 gets underway.

For these reasons, it is desirable that the government categorize potential investment areas in order of preference and publish an investment priorities schedule as official investment policy and guidelines. The manifestation of investment priorities as policy and guidelines by a duly authorized government agency will encourage rather than discourage serious foreign investors by way of removing much of the uncertainty which now clouds investment decisions. This method has an added advantage of greater latitude with which the government can offer more generous preferential incentives in high priority areas.

To encourage the hiring of local residents, the rebatement and abatement of taxes could be made proportional to the percent of wages and other benefits paid to resident labor. The reason for choosing percentage of benefits rather than percentage of labor as a criteria, is that use of local labor at the higher levels of organizational hierarchy should be especially encouraged.

The tax incentives are often inadequate in reducing the degree of risk associated with "venture capital" for new businesses. Tax benefits resulting from such programs cannot be realized until after the firm becomes operational and substantial profits are made. To help reduce the initial risk, the government should play a more active role in the initial stage of business venture. Much of the initial risk should be assumed by the government on high prioritized projects by way of minimizing the initial capital requirement on the part of private entrepreneurs.

When a potential investor is invited to Guam, a series of negotiations involving a delicate swapping of concessions on a case-by-case basis must precede the final investment decision. Indiscriminate treatement of potential investors with the inventive programs may even frighten serious potential investors who demand preferential treatment in exchange for the high risks involved. Some form of protective measure for "new industries" merits careful consideration on the part of policy makers and, under certain circumstances, can be well justified. It is, therefore, important to identify the bargaining leverages the government can use in bringing potentially sound investment proposals to fruition. In addition to the tax incentives, some of the obvious tools are:

1. Effective use of GovGuam owned lands, various lease/lease purchase/purchase programs can be worked out;
2. Strengthening the government loan/loan gurantee capability since federal funding alone cannot provide sufficient funds and is unpredictable.

3. Strengthening the government's financial as well as technical capability to become a working partner (joint venture), thereby keeping close control over management with potential bureaucratic inefficiency; and

4. Effective use of licensing power to promote a healthy business environment as well as to mitigate high risks by way of protecting "new industries" from undue competition harmful to all parties concerned.

D. Expansion of Harbor for Public and Private Use.

As discussed in Section II. B, there is a need to expand Apra Harbor if the transshipment and warehousing concepts can be performed efficiently. Greater space at the port for public and private use is vital for the development of industries that require waterfront space. Bottlenecks inhibiting economic development are common throughout the world in areas where port development has not kept up with economic growth. Guam must insure that Apra Harbor is developed to avoid constraints in the future.

E. Promotional Campaign.

The most significant problem faced in promoting light industry on Guam is that the island is relatively unknown and not usually thought of as a candidate site for a manufacturing plant. Also, there is a lack of knowledge of the advantages of locating a plant on Guam.

Before any promotional campaign is initiated, however, Guam must first identify those industries that it wants to get established in Guam and prepare a thorough industry study. Because of its small market, higher wages and limited number of skilled workers, Guam must find areas

where it can specialize, where it can perform unique functions, and where it can complement the tourist industry. Major importance should be placed on the preservation of open space and natural beauty of the island, conservation and efficient use of the island's limited fresh water resource, and the maintenance of a clean and healthy environment in the encouragement of any light industry on Guam. In our desire to create employment through light manufacturing and diversify Guam's economic base, we must not lose sight of Guam's natural endowment that helps attract tourists to the island.

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 are required. Furthermore, the person(s) charged with soliciting must be competent and highly knowledgeable of Guam's potential industries. 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.

IV. CONCLUSION AND RECOMMENDATIONS

Manufacturing represents an important segment of Guam's economy. In 1975, the manufacturing sector contributed $117.1 million in gross receipts tax and employed 1,211 persons. Manufacturing is now the second largest contributor to gross business receipts and encompasses a wide range of activities including bakery products, dairy goods, ice products, soft drinks, local handicraft, and oil refinery, feed mill, textile firms, rock crushing, food processing, and others. Current manufacturing on Guam is mostly for island consumption with the exception of the textile industry.

Acceleration of the rate of existing manufacturing output appears to be a difficult task in view of the limited domestic market and the present general sluggishness of the economy. However, increased exportation of processed garments to the mainland is a good possibility with the entrance of three new garment manufacturers on the island.

During this period of high unemployment, the policy objective should be to promote economic growth and stability. New investment in Guam must be encouraged to help bring about higher local employment and a faster rate of economic growth. In order to conduct an effective promotional campaign, Guam must set up a list of manufacturing activities in order of preference. This official manifestation of investment priorities by the Government of Guam must take into account both short-term and long-term benefits of the investment, preservation of open space and natural beauty of the island, conservation and efficient use of the island's limited water resource, and the maintenance of a clean and healthy environment.

Guam must undertake comprehensive industry studies which assist investors in determining the viability of such industries on Guam. These studies must also include investment incentives offered by the government. It is strongly recommended that the Department of Commerce and GEDA undertake the publication of an investment priority schedule and the initiation of selected industry studies.

The encouragement of investment on Guam should result in the development of local manpower resources rather than relying on imported alien labor. A re-examination of the educational system, vocational, and government training programs must be undertaken to find ways and means of providing young people with the skills required by prospective industries. It is also recommended that the government encourage the hiring of local residents by rebating and

abating taxes proportional to the percent of wages and other benefits paid to resident labor. This policy is especially beneficial in encouraging the development of local personnel at the higher levels of organizational hierarchy.

There are serious limitations to the use of tax incentives in reducing risks faced by a new industry moving to a market that has not yet been explored. To encourage certain highly desired new industries to come to Guam, the government should be prepared to assume some of the risks faced by the private firm by way of minimizing the firm's initial capital requirement. Depending on the benefits to be derived from a particular new industry, the government must be prepared to use a variety of techniques in addition to tax incentives, in inducing a new firm to relocate to Guam.

Some of the tools available to the Government include lease of government land, extension of government loan or guaranty, government becoming a working partner (joint venture), and effective use of licensing power to protect a "new" or "infant" industry.

Transshipment and warehousing show potential but require careful analysis to ensure that their development will have a maximum long-term beneficial economic impact on Guam. Since Apra Harbor does not have sufficient space for efficient transshipment and warehousing, an appropriate site should be located and included in the master plan for the entire harbor area. It is recommended that Government of Guam seek the cooperation of the Navy in preparing and implementing a long-range development plan for Apra Harbor.

It is recognized that very little is known about Guam as a potential manufacturing site to the outside world. Thus, if a certain type of investment is desired on Guam, the Government must seek companies or individuals who are experienced and knowledgeable with this type of investment to consider the advantages of relocating to Guam. In doing so, the direct solicitation approach is recommended.

Table 1

Total Guam Employment: March, 1975 and August, 1976

Industry Division	March 1975 Total Number	March 1975 Percent of Total Industry	August 1976 Total Number	August 1976 Percent of Total Industry
All industries	34,938	100.0	29,700	100.0
Private Sector	19,241	55.1	15,700	52.9
Agriculture	111	0.3	100	0.3
Construction	5,388	15.4	3,000	10.1
Manufacturing	1,211	3.5	800	2.7
Transportation & Public Utilities	1,587	4.5	1,500	5.1
Trade	5,541	15.9	5,200	17.5
Finance, Insurance, & Real Estate	1,363	3.9	1,300	4.4
Services	4,040	11.6	3,800	12.8
Public Sector	15,697	44.9	14,000	47.1
Federal Gov't	6,681	19.1	6,500	21.9
Territorial Gov't	9,016	25.8	7,500	25.2

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

Table 2

Total Employment, By Industry Division and Citizenship Status: March, 1975

Industry Division	Total	Non-Immigrant Alien Number	Non-Immigrant Alien Percentage
All industries	34,938	5,747	16.4
Private Sector	19,241	5,618	29.2
Agriculture	111	52	46.8
Construction	5,388	4,409	81.8
Manufacturing	1,211	183	15.1
Transportation & Public Utilities	1,587	66	4.2
Trade	5,541	420	7.6
Finance, Insurance & Real Estate	1,363	59	4.3
Services	4,040	429	10.6
Public Sector	15,697	129	0.8
Federal Gov't	6,681	52	0.8
Territorial Gov't	9,016	77	0.9