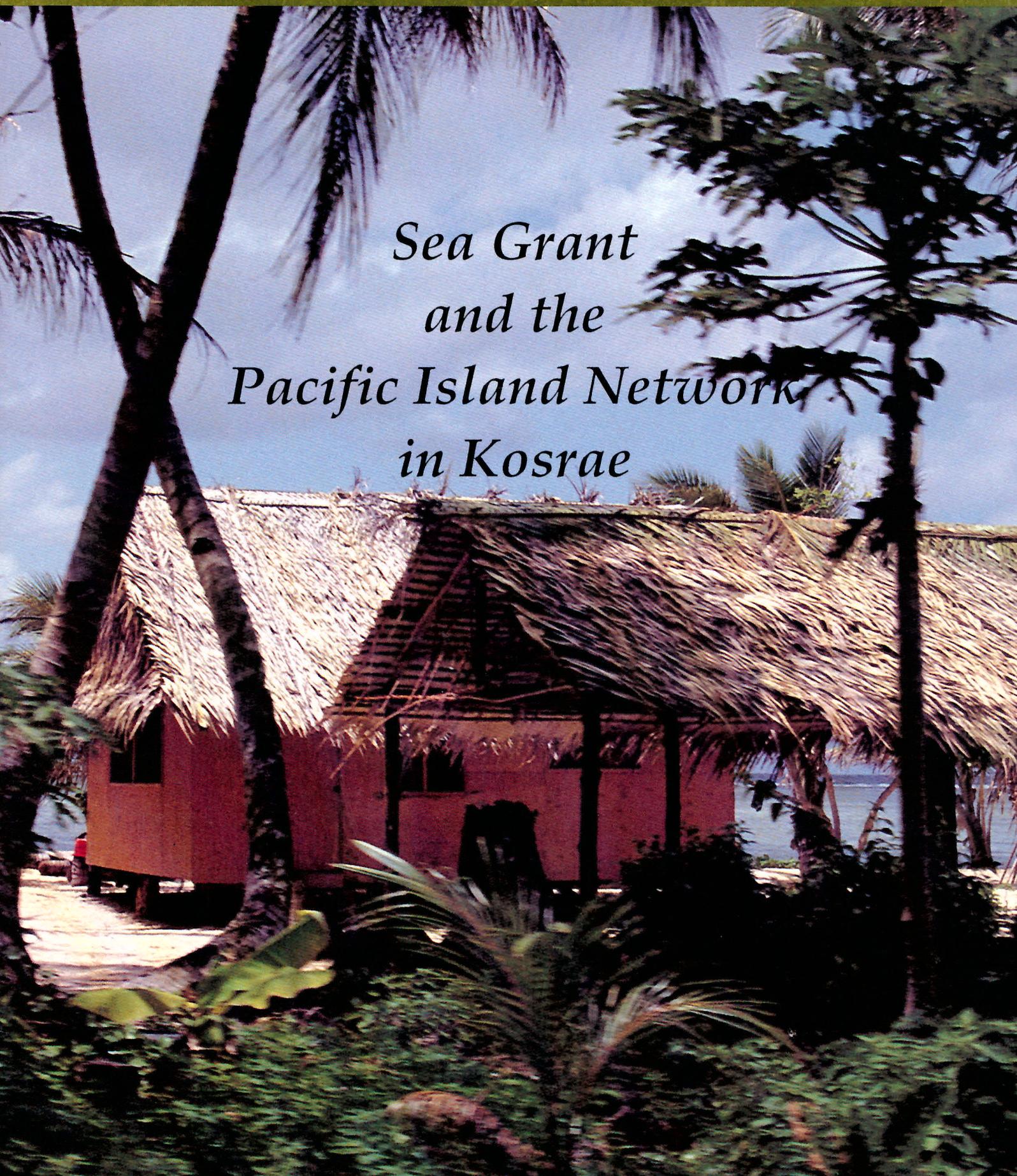


Malama Kai *Care for the Sea*

Volume I, Number I

Sea Grant and the Pacific Island Network in Kosrae



Malama Kai *Care for the Sea*

Volume I, Number I

Sea Grant and the Pacific Island Network in Kosrae

Table of Contents

Introduction	3
From Reef to Forest: Coastal Resources Management in Micronesia	4
Kosrae: Past to Present	7
The Pacific Island Network	10
From Inventory to Legislation: How it Worked	11
Kosrae Today	16
Options for Economic Development	19
Kosrae's Future	23



Sea Grant, a unique partnership with public and private sectors combining research, education, and technology transfer for public service, is the national network of universities meeting changing environmental and economic needs of people in our coastal, ocean, and Great Lakes regions.

The University of Hawaii Sea Grant College Program, directed by Jack R. Davidson, was established in 1968. Its mandate is to promote the wise use and greater understanding of our nation's marine resources through research, education, and extension services. UH Sea Grant supports numerous research projects, an extension program, and a communications unit.



Introduction

The island of Kosrae is an unspoiled jewel, sparkling like a jagged emerald in a lapis sea. It is the quintessential tropical island to which people dream of escaping. There are no skyscrapers on this mountainous island, no luxury resorts, no traffic jams, no congested waterways, precious little pollution and very little crime. Located 2,813 miles southwest of Honolulu, Kosrae is the furthest east of the four Federated States of Micronesia. The island is a paradise that remains virtually pristine.

Although some development has occurred within the last decade, the island has, for now, been spared many of the environmental and cultural problems that usually accompany economic development. Kosrae, therefore, may be a test case for sustainable development. It has the rare opportunity to attempt to develop without ruining its environmental beauty, while keeping its historic and cultural heritage intact.

Recently, the people of Kosrae took an important step toward creating a sustainable future. On April 13, 1992, the Fifth Kosrae State Legislature unanimously passed a law that will help to ensure that "Kosrae remains Kosrae." The legislation requires the preparation of a land use plan and permitting process, and replaces the Environmental Protection Board with a Development Review Commission and a Technical Advisory Committee. It is the only comprehensive development plan in Micronesia, legislating the preservation of

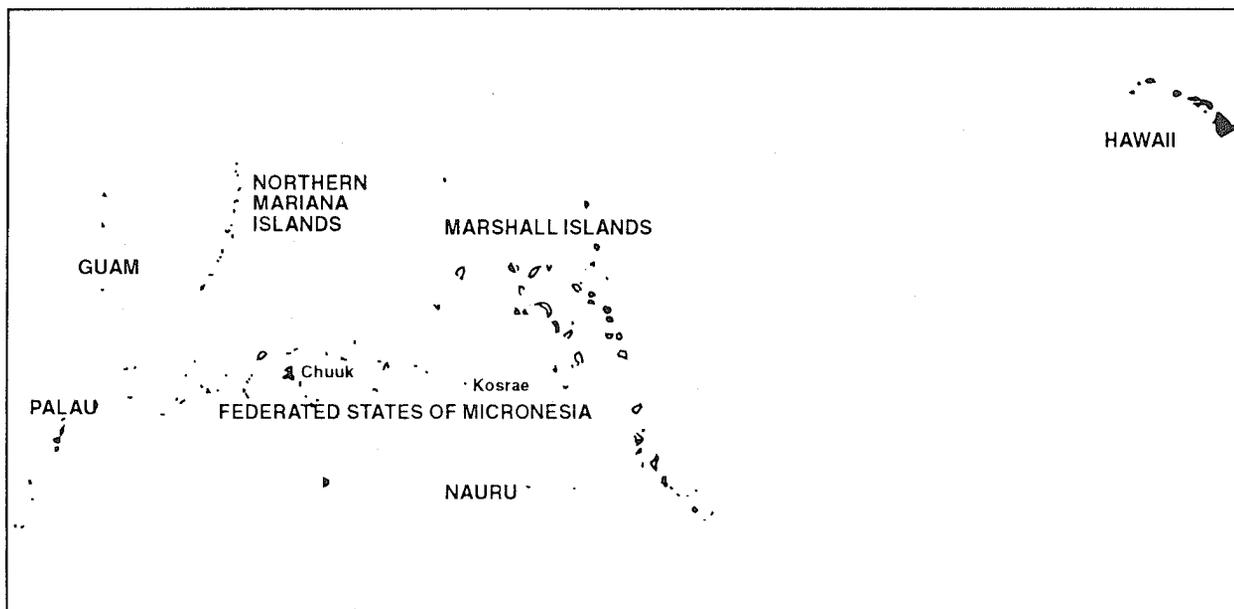
history and culture as well as water, land, and air. It is now being viewed as a possible prototype for resource management and development planning legislation in the Federated States of Micronesia and other island nations.

This momentous piece of legislation was drawn from guidelines set forth in the *Kosrae Island Resource Management Plan*, created to assess alternatives and ensure that the best development options are chosen in the future. The plan resulted from the efforts of several agencies within the Pacific Island Network (PIN), including the University of Hawaii Sea Grant Extension Service, US Army Corps of Engineers, the East-West Center, and the Guam Coastal Zone Management Program. That document, published in 1991, came out of a unique cooperative process involving academics, US federal government personnel, and, most importantly, the Kosraean government.

The following pages attempt to convey the hopes and fears of the Kosraean people, and the challenges they have overcome to preserve their home. It describes Kosrae itself, its opportunities for growth, and the problems that may accompany development. It is intended to serve as a model for other states and nations with similar hopes and fears.

From Reef to Forest:

Coastal Resources Management in Micronesia



The islands of Micronesia come in a variety of shapes and sizes. Many are atolls, coral reefs whose sandy islands emerge only a few feet above the surrounding sea. Others are lush, mountainous islands with summits reaching as high as 2,500 feet. Several thousand islands together form little more than 700 square miles of dry land, yet their Exclusive Economic Zones encompass an ocean area almost the size of the continental United States. Because of this geographic diversity, the region possesses a variety of coastal and marine environments inhabited by equally diverse flora and fauna.

The Federated States of Micronesia (FSM), composed of about thirty-five island groups, encompasses what Spanish explorers named the Caroline Islands. The country is culturally diverse. Aside from English,

the *lingua franca* of the nation, at least five major languages are recognized. Practically every island has its own dialect, which may or may not share similarities with that of neighboring islands. Patterns of social organization and cultural practice vary just as widely.

Because of this diversity, the FSM has chosen a loose system of government. While the national government has authority over the Exclusive Economic Zone, most authority resides within the four states that make up the federation: Kosrae (formerly Kusaie), Chuuk (formerly Truk), Pohnpei (formerly Ponape), and Yap. The states assert jurisdiction over resources within the 12-mile limit of state waters.

The center of each state is a high volcanic island or group of islands. With the exception of Kosrae, each state also

encompasses a group of outer islands almost all of which are atolls or atoll remnants. Problems of land area, population, infrastructure, economic development and, not surprisingly, environmental quality are most visible in the state urban centers.

Despite the FSM's environmental and cultural diversity, issues relating to resource management are fairly similar in all the states. These major issues include:

Reef Destruction: In all states there is a demand for fill material, primarily for road construction. Typically, this is acquired by dredging coral from nearshore fringing reefs. Aside from destroying the reef, if adequate retention measures are not taken, dredging and filling can choke adjacent reefs with silt.

Erosion and Sedimentation: Land cleared for commercial, residential, and road construction is subject to erosion, especially during periods of heavy rainfall. Sediments transported to fringing reefs or lagoons smother and kill coral.

Habitat Destruction: Fringing mangrove forests are often indiscriminately logged. Gardening in upland forests often results in loss of species diversity and may also increase erosion.

Water Pollution: Urban areas on all four of the high islands have sewage collection and treatment systems. Due to low budgets and inconsistent maintenance, however, these systems do not always offer adequate treatment. Over-water toilets and livestock pens are also a problem in densely settled areas. Perennially flowing rivers are used for bathing, washing clothes, and disposal of animal and human wastes. Also, solid waste disposal sites are often located in coastal areas.

Over-exploitation of Renewable Resources: Micronesia's marine resources are relatively rich in comparison to coastal areas in much of the developing world, but overfishing is a problem. Rare and endemic forest birds are often hunted as well.

Coastal Erosion: Shoreline erosion is primarily a problem on some of the sandy atolls. While the atolls have almost no infrastructure or developed urban areas to protect, the national government has funded seawall construction for some outer islands. These seawalls are often built with no analysis of coastal processes, are not carefully engineered, and so are rarely effective.

Like many developing countries, the FSM's governments' ability to effectively manage natural resources has traditionally been restrained. Governments have tended to give preference to development activities over conservation efforts. Large sums have been invested in resource extraction projects, such as fisheries ventures, which promise a monetary return. Conservation agencies have been less lavishly funded. Priority has been given to "input" infrastructure like roads and electricity rather than "output" infrastructure such as sewage treatment systems and well-designed solid waste disposal sites.

Island environments are complex and interconnected; even limited development activity can have significant impacts. Because of the nation's small population, limited manpower and lack of enforcement power within management agencies often hamper enforcement efforts. Broader institutional and cultural factors also play a role. The state is rarely seen as the legitimate steward of common property resources. This problem is compounded by jurisdictional confusion. National legislation confers broad powers on the national government to regulate the discharge of pollutants, but states often bristle at what they see as unreasonable intrusion into state affairs.

Because of geography, indigenous cultural values, and political status, managing and conserving natural resources on these islands presents special challenges and opportunities. Over the past four years, Sea Grant has been working with the FSM to



In order to build a house in Kosrae, the land must often be created first. This hillside near Tafunsak has been bulldozed to provide fill.

develop coastal resource management programs that will strengthen local management efforts.

The trend has been for states to assume more authority over their natural resources through the enactment of legislation at the state level. Yap enacted environmental legislation in 1987. The Pohnpei State Legislature enacted similar legislation in 1991, but it was vetoed by the governor. Kosrae has taken the first step in implementing a coastal resources management program by passing legislation that established a project review process. This is similar to the national environmental protection legislation, but more comprehensive.

State and national governments in the FSM are largely dependent on US aid as a source of revenue through the Compact of Free Association, the treaty that established the current political relationship between the US and the FSM. The cash economy of

the FSM is largely driven by this funding. An export-oriented primary production economy capable of generating tax revenues to replace this aid has not yet been developed. The compact, ratified in 1986, extends for a 15-year period, during which time US aid diminishes in a series of "step-downs", until all aid is terminated at the end of the compact period. In some of the states, it is likely that government resources will shrink over the next few years.

Recently, there have been efforts to coordinate state management programs and define a role for the national government. With funding from the Asian Development Bank, the South Pacific Regional Environmental Programme has been assisting the FSM in developing a National Environmental Management Strategy. A framework for a national environmental agency has been developed, but whether it will be implemented through national legislation remains to be seen.

Kosrae: Past to Present



“We floated peacefully in the middle of a spacious bay which was bathed with the verdant forests of the shores... the tall summits of the island rose to the right and left... covered from top to bottom with a thick green carpet. In the middle... arose the little island of Lelu, surrounded with the pretty huts of islanders and crowned by a hillock of greenery. Add to this a magnificent day, balmy temperatures due to the sea breeze and the cries of the joy and admiration of our companions, and one can get an idea of the feeling which filled our souls in the midst of a simple, peaceful, and generous people.”

*...from the journals of Edmund D’Urville, as quoted in
The Sleeping Lady Awakens, by Harvey Gordon Segal*



This path leads to the village of Walung. It is the only village left in Kosrae without a road leading to it.

Many areas of Kosrae have not changed much since French explorer Louis Dupprey first laid eyes on the island in 1824. His second mate, Edmond D'Urville, recorded observations of the crew in French. (Phil and Lynn Ritter, Peace Corps volunteers on Kosrae, translated his records into English.)

Western discovery was followed closely by the whaling trade, which wreaked havoc on the island. Whalers from places like Cape Cod and New Bedford, Massachusetts, sent ships to the Pacific Ocean beginning around 1825. Maui, Pohnpei and Kosrae were the ships' ports away from home. The whalers introduced many new things to Kosrae, including metal tools, cattle, goats, tobacco, whiskey, and disease. The disease took its toll; within 60 years, the population dropped from several thousand in 1824 to less than 300 in 1880.

The first American who gained notoriety on Kosrae was Captain Bully Hayes, a

trader and a pirate. His drunken escapades, including the alleged rape of a nine-year-old Kosraen girl, caused horror on the tranquil island.

By the time the first missionaries arrived in 1852, the population of the Kosraen people had dwindled. The king, called Good King George, was at first suspicious of the missionaries' intentions. He had only recently learned how foreigners' presence on the island could undermine his authority. The missionaries convinced him that they would teach only the Bible, and that the Bible taught men to honor their king. King George then lent his whole-hearted support to the missionaries.

He saw religion as a way to save Kosrae from the debauchery that had caused so much destruction on his island. He believed the missionaries had the ability to achieve what they said was their goal: to save the islanders from extinction. He ordered his

people to build the first two stone churches without pay.

Now, over a century later, Kosraen leaders are still watching out for ways to save the island and preserve its natural and cultural resources. "This is a one-island arrangement," said Gerson Jackson, director of Budget and Planning for the Kosrae State Government. "If we mess this island up, and we end up with this island being uninhabitable, there's no way we can fix it. We don't have the means to buy another island, or recreate Kosrae."

Jackson's sensitivity to environmental issues was one of the factors which led to the development of the *Kosrae Island Resource Management Plan*, a carefully drawn up blueprint for development on the island. After years of effort on the part of Jackson and his colleagues, that plan recently became law.

Awareness of the island's fragility also guides public education efforts at the

Department of Conservation and Development. "Here in Kosrae, there is only one island," said Simpson Abraham, of the Marine Resources Division. "If we cannot educate our people to know how to make use of our reefs and other things, that's our own fault."

Kosraens remember their turbulent past, and keep it in mind when planning for development. "We don't want to repeat the mistakes of the past. The whaling industry caused a lot of problems for us," said Lewis Brooks, director of the Kosrae State Department of Conservation and Development. "We're very cognizant that this might happen again if we don't develop in a way that protects us."

Many of today's leaders see the *Kosrae Island Resource Management Plan* as a way to do just that.



The Pacific Island Network: A brief description

The Compact of Free Association was negotiated in 1982 and approved in 1986. The compact pledged US aid to US-affiliated Pacific islands, including marine and coastal technical assistance administered by the US Department of Commerce through the National Oceanic and Atmospheric Administration (NOAA).

In 1987, representatives of NOAA met with business people from the newly formed Federated States of Micronesia (FSM) and the Republic of the Marshall Islands (RMI) to determine the best way to provide assistance to the nations of FSM, RMI, the Commonwealth of the Northern Mariana Islands, the Republic of Belau, and the unincorporated territories of American Samoa and Guam.

The representatives decided that the islands would be best served by a coordinated effort with programs and projects in the Pacific. With technical assistance funding from the Office of Territorial and International Affairs (OTIA), and Department of the Interior, the Pacific Island Network (PIN) was born. PIN's primary objective is to provide information on coastal and marine resources, and to promote sustainable economic development through the wise use of resources.

The US agencies that make up PIN include NOAA (the National Marine Fisheries Service, the National Sea Grant College Program, Coastal Zone Management Program), Department of the Interior (OTIA, the National Park Service, the US Fish and Wildlife Service), the Environmental Protection Agency, the US Army Corps of Engineers, the USDA Forest Service, and others.

The non-governmental agencies involved in the program include the University of Hawaii Sea Grant College Program, East-West Center, Pacific Basin Development Council, Center for Tropical and Subtropical Agriculture, Pacific Business Center Program, and the Nature Conservancy.

PIN is not in itself a separate entity. It is a consortium which coordinates various agencies' efforts and improves communications between the islands and agencies. Its daily activities are coordinated through its Hawaii office at the University of Hawaii Sea Grant College Program.

Near the top of PIN's list of accomplishments is the *Kosrae Island Resource Management Plan*, a plan that PIN helped develop. Ultimately, the success of the plan will depend on the implementation of the law.

From Inventory to Legislation:

How it Worked

In July 1989, a group of Americans arrived on the island of Kosrae. They had been invited to the island to help the government come up with a plan for sustainable development.

The groundwork had already been laid. Under the authority of Planning Assistance to the States, the US Army Corps of Engineers did a coastal resource inventory in 1987. Under the direction of James Maragos, the Chief Environmental Officer for the Corps at the time, the Corps worked closely with the local fisheries office and other local government agencies to achieve their goal. The team looked at cultural, historical, and marine resources.

The inventory consisted of scientific observation and interviews with both government leaders and village elders, who acted as historians and guides. In order to find out

what should be inventoried, the interviews focused on where resources were and why they were important to the Kosraeans.

"I've always been an advocate of cultural preservation along with ecological conservation," said Maragos, now a Research Associate at the East-West Center and director of Conservation Science at the Nature Conservancy's Pacific Regional Office. "We wanted to promote cultural preservation from the start."

To accomplish this, Maragos invited archaeologist and Kosrae historic preservation officer Teddy John with him on the

inventory studies. Use of the historical, cultural and ecological perspective led to a comprehensive inventory, which was the first step toward developing a land use plan.

The point of the inventory was to serve as a catalyst to get the government to say, "OK, now we need to draw some lines on maps and decide which areas need to be protected," according to Maragos.

"Kosrae is the only island that has taken that to heart," Maragos added.

The US Army Corps of Engineers and the UH Sea Grant Extension Service had also done inventories in Pohnpei, Yap, and Chuuk, the other islands that make up the

Federated States of Micronesia. But those states have not yet opted to go forward with a new plan for development. "Outside of American Samoa and Hawaii, coastal zone management is something that people

aren't familiar with," Maragos said. "In Kosrae, they were very interested."

Why haven't the other states followed Kosrae's lead? The answer is both cultural and political, according to Maragos.

"Developing management plans with Pacific Islanders is very difficult," Maragos explained. "They are basically distrustful of western land use ideas."

The natural resource treasures of Kosrae had been virtually untouched for centuries, and only recently people had begun to see the negative impacts of a few major development projects. During the period from the

"We wanted to promote cultural preservation from the start."

late 1970s through the late 1980s, the airport was constructed, a dock was built, and construction on a circumferential road began. As a result, public awareness of the need for environmental protection increased steadily.

The US Army Corps of Engineers issued the permit to build the airport. Because there was no available land on which to build a new airport, land had to be created. This was accomplished by dredging the coral reef at Okat Harbor. Even after the Corps reduced the size of the project from a 9000-foot runway with a parallel taxiway to a 6000-foot runway without a taxiway, the fish catch declined by half in that area, according to Maragos.

"We put as much effort as we could into protecting the environment," he said. "But by putting an airstrip on a coral reef, you are going to cause an impact to the reef, there's no getting around it."

At the same time, road construction between Tafunsak and Okat caused soil erosion. An earlier project, the construction of a causeway to Lelu Island, had caused pollution and fish migration. The people of Kosrae realized then that if they did not do something to protect their environment,



Gerson Jackson, considered a leader in educating Kosraeans about the effects of unplanned development, at his office in Tofol.

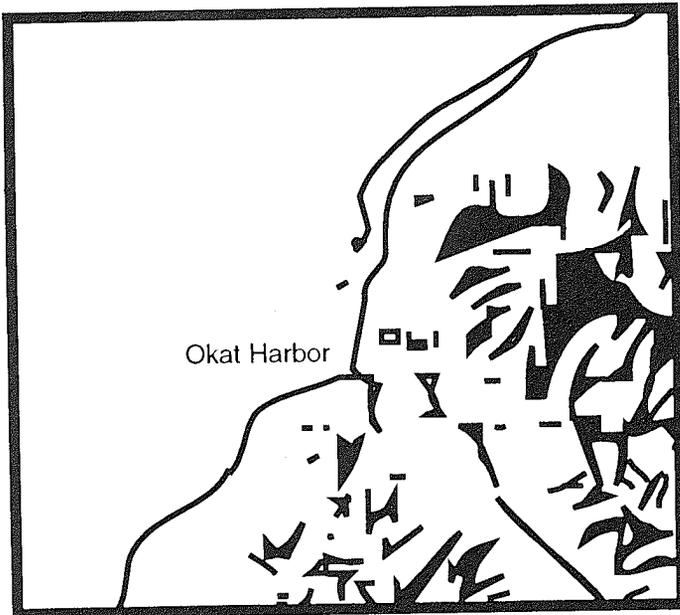
things would only get worse. Gerson Jackson in particular has been recognized as a leader in educating the Kosraeans about the effects of unexamined, unplanned development.

"My family owned the whole area from the top of the mountain down to the reef at Okat. It used to be the most fertile reef on the island. That's where we fished," said Jackson, who was about to go back to college in California at the time the airport construction plans were being finalized. "That really started me thinking about being a resource conservationist."

After seeing the island change so drastically during the first several years of his tenure as governor, Governor Yosiwo George and Jackson, director of the Department of Conservation and Development at the time, solicited the help of Sea Grant to come up with a plan for managing the resources that had been inventoried in 1987. He also asked for Sea Grant's help in explaining the concept of resource management to the people of Kosrae.

"I had a hard time convincing the members of the coastal resource management committee that it should be a total program for the entire island," said Jackson. "We told the people that anything you do on top of the mountain will affect the fish in the ocean."

The UH Sea Grant College Program responded to Jackson's plea with a proposal to study the economic, social and environmental impacts related to road construction on Kosrae. The proposal sparked a dialogue between Kosrae government officials and Bruce Miller, director of the UH Sea Grant



Extension Service, and coordinator of the Pacific Island Network (PIN).

Miller explained that the most important step of the process was gaining the confidence of the Kosraean government. "We worked with them long enough so that they developed trust in us to let us do the work," he said. "That entailed a lot of meetings, a lot of talking, making them feel we weren't just going to come in and tell them what to do.

"We didn't go down there and say, 'Don't build the road.' We said, 'If you're going to build the road, be careful not to cover the reefs, don't silt the reefs, don't dredge the areas that you're depending upon for subsistence fisheries,'" Miller said.

The ensuing preliminary report implied that the Kosraean government should initiate a comprehensive coastal resource management planning project. The government then requested Sea Grant's assistance to do the comprehensive plan.

Two years later, in 1989, under an informal agreement between the UH Sea Grant Extension Service and the state government of Kosrae, a multi-disciplinary team of experts went to Kosrae to look at various aspects of the island's resources, economics and history. The results of those studies formed the basis of the *Kosrae Island Resource Management Plan*.

UH Sea Grant and PIN brought together the team from academic and government agencies throughout the Pacific, and carried out the research.

"We got the right people from Sea Grant," said Jackson. "They were able to assess our situation and allow people from different disciplines to work with us."

The project committee involved fisheries and forestry experts, as well as specialists in coastal zone management, coastal engineering, economic development, wetlands conservation, historic preservation and tourism from the US and the FSM.



Madison Nena, administrator of the Tourism Division, takes researchers up the Walung-Utwe Mangrove Channel.

Madison Nena, administrator of the Tourism Division, acted as the tourism advisor for the team. Nena took the team to areas that were being considered for preservation, and later conducted surveys with members of the community to find out about their perceptions of tourism.

"I asked people, 'Do you know what tourism is?', and the first thing they say is money," said Nena, laughing. "A few people mentioned conservation, but there were many things about tourism that they were unaware of."

Nena and his team found that the older people in the community liked the idea of tourism as a way of preserving their culture and the economy for the next generation. "Some of the elders are thinking about the future, and thinking that if you stop tourism, what other source of money do you have?" Nena explained.

The PIN-sponsored study became the basis for the legislation that was drafted. "Everything in the plan was used; the concepts, the ideas behind resource conservation," said Jackson. "I formally transmitted the (Sea Grant/PIN) plan with the bill to the legislature."

After seven drafts, the legislation passed on April 13, 1992.

Getting the legislature to accept the bill required Jackson, Nena, and George to educate the 14 members of the Kosrae State Legislature.

"It was very difficult. We had to go back and forth with the legislature," said Nena.

"The concern was: we already have an Environmental Protection Board, why should we create another?"

As a US Trust Territory, Kosrae had an Environmental Protection Board (EPB) under the jurisdiction of the US Environmental Protection Agency. However, many people in the government, Jackson included, thought that the EPB was ineffective, because it lacked a land use plan and the legal control with which to enforce it.

"The EPB had no plan because it was based on the Trust Territory EPB. It had no real authority," said Jackson. "The new law has teeth."

The new legislation establishes a Development Review Commission, which will prepare a land use plan and permitting process for the state of Kosrae. It also includes a technical advisory committee.

"Most people don't realize that there really wasn't much expertise on the EPB," said Nena. "Now we have the advisory committee that has people from historic preservation, marine resources, forestry, tourism. That's the main thing. And it will work."

Their work is not over yet. "What we have here is the paperwork. What we need now is somebody with knowledge and experience to come down and help us spearhead this program," said Jackson.

The Development Review Commission is designed to be an independent entity, supported by the Department of Conservation and Development, the Department of Health Services, and the Office of Budget and Planning. Jackson's office is currently

nominating people to sit on the Commission, and looking for a person to head the program. After that, a land use plan and permitting process will be developed.

"The first step is the land use plan," Jackson explained. "It will be a comprehensive plan which will identify areas that can

be used to site projects, and identify areas that we need to pay special attention to."

Lewis Brooks, director of the Department of Conservation and Development,

believes that requiring

environmental impact statements for every development project is too stringent. "I think that the board should have the flexibility to demand that an environmental impact statement be done, but I don't think it needs to be stated in the law itself. And I don't think that every project should be required to do so."

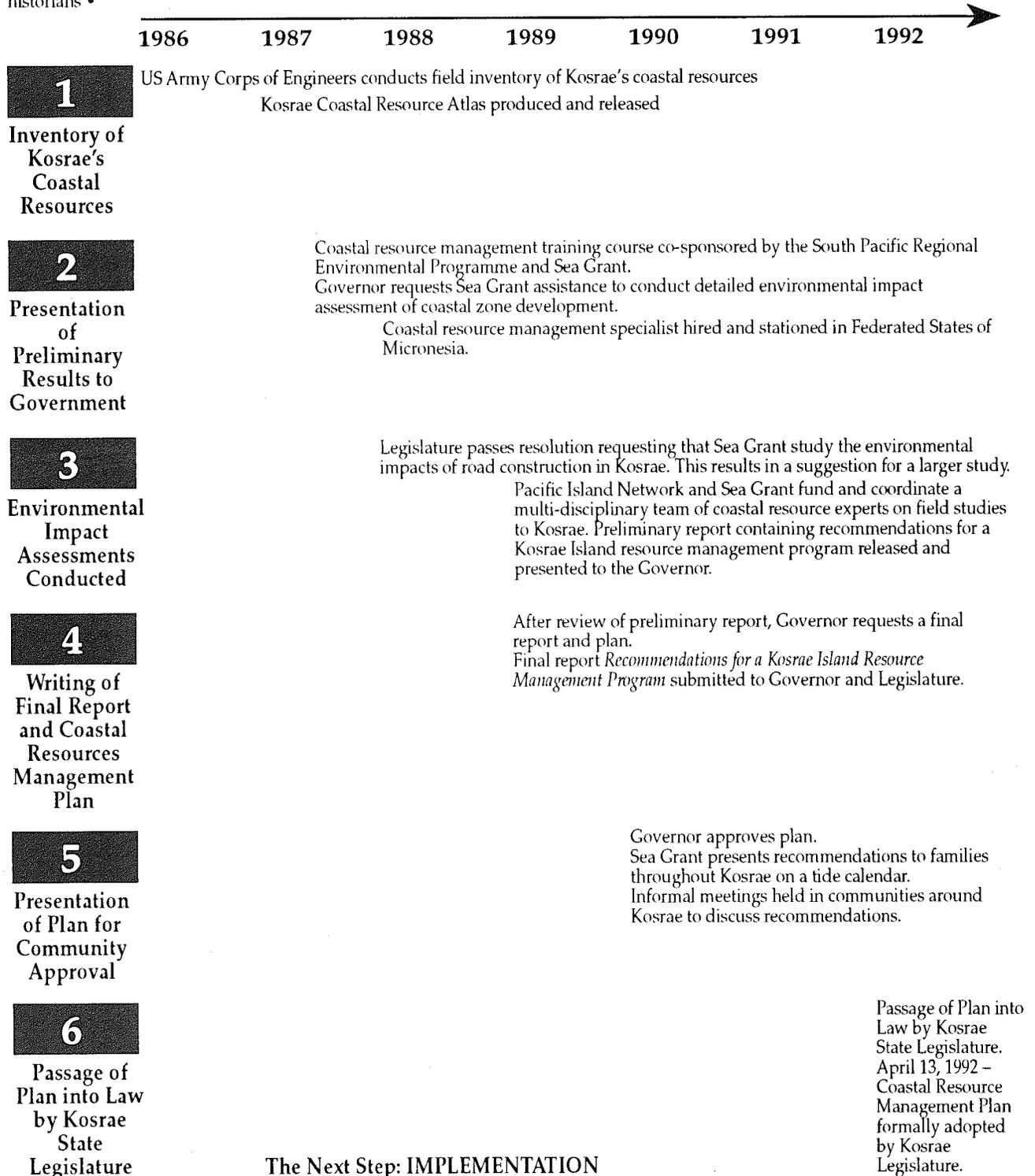
But Jackson said there are practical parameters. "We won't require a permit for everything. We won't try to block a housewife from putting up a pig pen," said Jackson. "But we would like to see anything that's potentially destructive put under the permitting process." Traditional resource uses, such as subsistence fishing and cutting mangrove trees for firewood will continue under the new legislation.

On April 13, 1992, the plan passed into law. The first comprehensive land use legislation is in place. Implementing the legislation is the next hurdle for the Kosraeans to overcome.

"What we need now is somebody with knowledge and experience to come down and help us spearhead this program."

Kosrae Island Resource Management Plan: Key steps toward implementation

The following organizations and people were involved at some stage in the creation of the Kosrae Island Resource Management Plan: Federated States of Micronesia Government leaders • Kosrae State Government • US Government: Army Corps of Engineers, Coastal Zone Management Program, Pacific Island Network, Sea Grant College Program • University of Hawaii • Community College of Micronesia • East-West Center • Kosrae Planning Committee: church leaders, community leaders, tourism experts, resource users, historians •



The Next Step: IMPLEMENTATION

Kosrae Today

Kosrae is a close-knit community, with 8,000 people spread over its 42-square miles. Unlike other states in the FSM, Kosrae has only one island and its people speak only one language other than English. The church is the backbone of today's society, just as it was when the missionaries marshalled the daily activities on the island.

On any day of the week, you can hear the sounds of lilting voices singing *a cappella*, drifting through the air like the wind. These are church songs, and they are more popular than the rock and roll or country and western playing on the radio. More than 95 percent of Kosraeans belong to Christian churches, predominantly Protestant. The church is a central part of people's lives, and it wields great social and political power.



Willy carves intricate wooden sculptures in the family's home near Tafunsak.

Gerson Jackson, director of the Office of Budget and Planning, believes this influence once led to a lackadaisical attitude toward planning. "These people are Christians, and that contributes to a laid back feeling and a for-granted attitude that the Almighty will take care of the world," said Jackson. "They wanted to have no responsibility for taking care of our limited resources." But that attitude has changed.

Jackson and other government leaders know that if they want their planning strategies and laws to work, they need the support of the church. The coastal resource management committee that Jackson put together to work with the Sea Grant team included leaders of the church, as well as government representatives and the private sector.

Madison Nena, administrator of the Kosrae Tourism Division, also sees the importance of gaining the support of the church. He is educating the ministers about tourism activities, and educating tourists about church beliefs and Kosraean customs. This will hopefully lead to less conflict between the church and the new tourism industry. The church, for example, does not allow entertainment on Sundays. It is a day reserved for rest and worship. Therefore, visitors who sail or snorkel on a Sunday may find themselves the target of public scrutiny. "We talked to some of the ministers about the concerns about Sundays," Nena explained. "There's a big question about that now. But one of the ministers said activities on Sundays is not what concerns him most. He just doesn't want tourism in his village."

The church influence also makes it improper for women to wear shorts or

swimming suits in public. That is something that visitors need to be informed of. One female visitor donning a modest swim suit and shorts near her hotel in the village of Tofol was surprised to find that she needed to wear long shorts over her suit in order to go swimming.

Nena hopes to accommodate both the church and his colleagues by preparing visitors more adequately on the mores of Kosraean society. He plans to circulate bulletins and put fliers in hotel rooms to educate tourists on acceptable behavior. Plans developed with the East-West Center and set forth in a study entitled *Integrated Coastal Resource Survey for Nature Conservation and Nature-based Tourism on Kosrae* and in the *Kosrae Island Resource Management Plan*, suggest that only certain areas be developed for tourism. Most of these places are at a sufficient distance from town centers.

Although Kosraean customs may seem restrictive to outsiders, this tight social structure has carried the Kosraeans from the brink of extinction through two world wars to the present. It may even help them determine their future.

Because most government leaders are also church and community leaders, there is no schism between the government and the public. The people tend to trust the government leaders, and the leaders feel a great sense of responsibility toward their constituents.

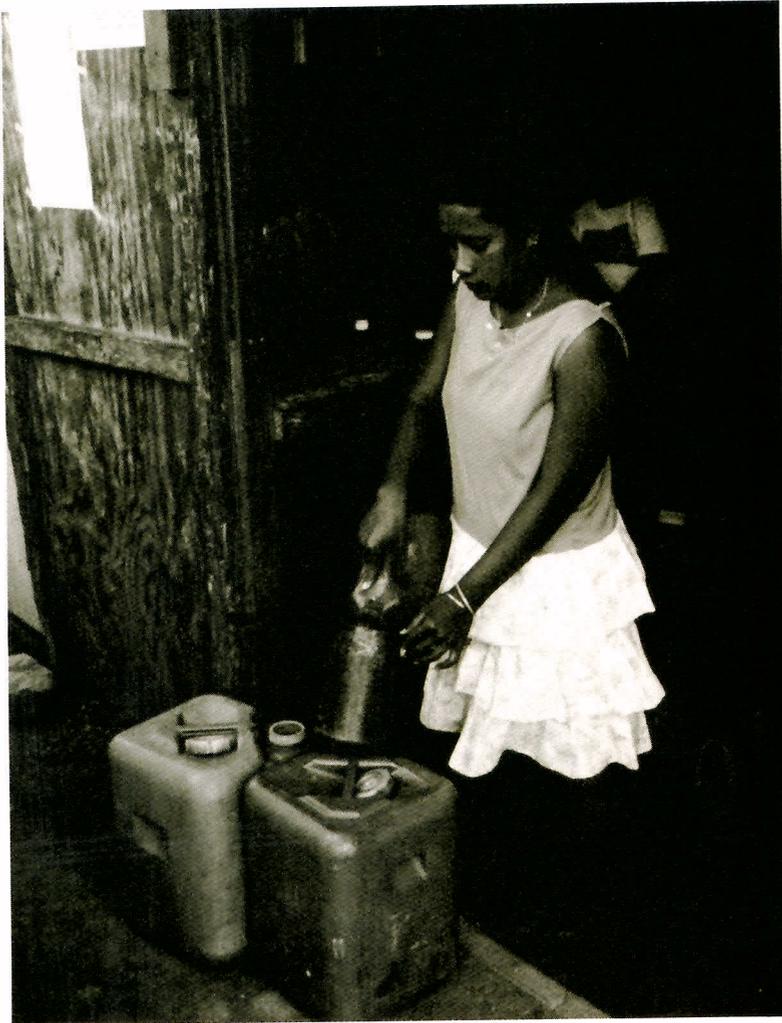
"People in government are very active members of the community," said Lewis Brooks, director of the Department of Conservation and Development on Kosrae. "Somebody who works in the government is not isolated from people in his community. They are the public, and they're respected members of the community." That uncommon bond between government and public contributes to the island's unity and also makes planning for development an easier task.



Naomi, a local crafts person, makes and sells wall hangings similar to those found in other areas of the Pacific.

The fact that Kosrae is a one-island state also contributes to the relative ease of land use planning. Because Kosrae does not have outer islanders with whom they must share their natural resources, they have more control over their own political destiny. Other states in the FSM must allocate resources to people from outer islands.

"Kosrae is a totally intact society," said Dr. James Maragos, Associate Researcher at the East-West Center. "Everybody lives close to each other, it's a more gregarious



A Kosraean woman pours gasoline for a customer in Tafunsak.

community . . . There's good information available on resource use and resource trends."

People are often called upon in church to witness to the congregation about what God is doing in their lives. So another advantage of church influence is that it instills personal confidence and a willingness to speak out and get involved in public meetings. Most people are proficient public speakers, and very comfortable talking to large groups. Under the new law, public meetings and hearings are the main vehicle for public participation in planning for development on the island.

If Kosraeans want to continue to control their future, they must decide how to handle their limited resources, how to preserve their lifestyle, and also how to

kindle their fragile economy. Currently, the government provides more than 80 percent of the jobs on the island.

In the year 2002, the Compact of Free Association with the United States will come to an end. That means that over 75 percent of the funds currently in use for the implementation of economic and social programs will end, along with all government operational funds, according to Jackson. The need to develop a strong diversified economic base is paramount to the survival of the island.

"It means that we have to strive harder in our efforts to develop a self-sustaining economy," said Jackson. "We need to develop a sustainable approach toward utilization of the environment and its limited renewable resources."

Options for Economic Development

Tourism

As you get off the plane in Kosrae, you are greeted not only by a gust of hot tropical air, but also by a crowd of curious Kosraeans. They gather there, on the airport lawn in the shade of trees, to watch planes and people arrive on their island.

The tourism trade offers vast economic opportunities. But there are fears about the influence that tourism will have on this island. In spite of these fears, the people of Kosrae know they must pursue new economic ventures if they are to survive in the coming years.

"We want to be able to generate revenues so we can rely less and less on outside sources that influence our way of thinking, our policies, and the direction we're going," said former Governor Yosiwo George in a 1990 interview. "We welcome foreign investment and help, but there's always a need for us to call the shots." George is now the FSM ambassador to the United Nations.

In fact, it is illegal for a foreigner to buy private land on Kosrae. The government may sell its land, but individuals cannot.

Governor Thurston Siba is currently considering a proposal from a Japanese investor to develop a golf course and luxury resort near the village of Malem. As with any political issue, there are people on both sides of the fence, some wanting the jobs and money that would come from having a resort on the island, some fearing the influence such an establishment would have.

Lewis Brooks, director of the Department of Conservation and Development, is one who is skeptical that the resort project will go through. His department has conducted some preliminary studies to determine the

potential impacts on the environment. "We have to get some source of outside revenue for our state," said Brooks. "We cannot go on just the income of the United States. We'll never be able to develop on that income alone. We can do some tourism, some fishing. How we go about doing them though, that's really something for us to contemplate at this time."

Most Kosraean leaders are aware of the problems of tourism. Gerson Jackson, director of the Office of Budget and Planning, attended colleges in Hawaii and California, and learned first hand about fast development and foreign investment.

"I'd been to Saipan, to Guam, to Waikiki, and I didn't like what was happening there," said Jackson. "I want Kosrae to be Kosrae, and always. We should try to learn from what we've seen in other places."

There is no doubt that tourism will have its place in Kosrae. According to Kosrae State Tourism Administrator Madison Nena, the number of visitors coming to the island has increased significantly since 1987. In that year, about 50 people visited each month. In 1992, the number had reached 250.

But Kosrae can afford to move slowly into tourism development, according to tourism experts at the East-West Center and the UH Sea Grant Extension Service. A full-scale tourism industry would drastically change the island.

According to East-West Center reports, small islands with a limited population, like Kosrae, do not have the indigenous population to support a burgeoning tourism industry; and if the indigenous population cannot support it, an alien population is likely to provide labor. Saipan, for instance, has recently experienced a population explosion, going from 15 thousand people



Sandy Beach Hotel, one of the most popular on the island, is being reconstructed to meet the demands of the state's growing number of tourists. Rustic bungalows will be refurbished, and new buildings will feature carpeting, air conditioning, and tiled bathrooms.

to 43 thousand in just five years. That is, in part, a result of the need to import labor for the new tourism industry.

With a tropical climate, friendly people, a unique rain forest, and spectacular diving on underwater cliffs and shipwrecks, Kosrae is a near-perfect tropical island getaway. Jackson and Nena hope that the Kosrae brand of tourism will be different from other islands.

"I still believe in a tourism that is compatible with our culture. So it will be on a low scale, and ecotourism will definitely play a part," Jackson said.

"We have learned from what other islands have done. I always use Hawaii, Guam, and Saipan as examples," said Nena. "We can have our own definition of tourism here."

The emphasis of a recent East-West Center report, *Integrated Coastal Resource Survey for Nature Conservation and Nature-based Tourism on Kosrae*, was on the area between Utwe and Walung on the south-

west coast. It is an area that is inaccessible by road, sparsely populated and thus one of the most untouched areas on the island. The area also contains ancient ruins which could be restored. Because of the natural resources and the historical importance of the area, co-authors James Maragos and Lawrence Hamilton believe there is a great potential for nature-based and cultural tourism there. The Kosrae state government recently authorized \$20,000 toward developing a park in the proposed area.

Fisheries

Fisheries is another development option, one that is most popular with the people of Kosrae. In fact, Kosraeans would like the fisheries industry to be the one to contribute most heavily to their economy.

A \$5 million grant from the Japanese government helped the Marine Resources Division build the best marine fisheries facility on the island, according to Jack



A multi-million dollar grant given to the Kosraeans from the Japanese helped to purchase this 52-foot fishing boat as well as several smaller fishing vessels.

Sigrah, administrator of the Marine Resources Division. The money paid for construction of a main dock and small boat basin, a cold storage unit, ice machines, fuel storage capacity, a 52-foot fishing boat, and several smaller vessels. Because there is a large subsistence dependency on nearshore resources, the Department of Conservation and Development is targeting pelagic, or deepwater, resources. These include skipjack and yellowfin tuna.

The most recent fisheries development project on the agenda is the construction of a tuna cannery at Okat Harbor. The cold storage for the cannery is complete, and the rest will be built over the next three years on landfill between the dock and the runway. The fish will be brought in from anywhere in the Pacific, according to Brooks, but the economic benefit will be in Kosrae. "It'll be a thousand jobs for us. We really can't identify any other industry that can give us that level of employment," Brooks said.

Jackson is cautiously optimistic about the project. "I have been supporting the project for its potential economic contributions in the form of employment opportunities, foreign exchange earnings, and an increased

tax base," said Jackson. "But I am frightened that it could turn out to be a major disaster if it is not planned and implemented properly."

According to Jackson, the state has secured the services of an American consulting firm to undertake a complete Environmental Impact Assessment prior to the construction of the proposed cannery. "We are very concerned about the potential negative side effects that this project could cause to our environment and social structure," Jackson added.

Because the cannery will be relatively small, processing only 30,000 tons of tuna per year, and because of its isolated location at a commercial port and strict management policies, the Department of Conservation and Development does not expect the cannery to have an adverse effect on the environment, according to Brooks.

But the project is a gamble. According to Mark Skinner, a business development specialist at the Pacific Business Center Program at the University of Hawaii, the government of Kosrae is committing \$30 million to the project. "That's nearly all of their development money," Skinner said. "So if this thing doesn't work, it's going to be a major disaster."

Some, like Maragos, feel there are better ways to tap into Kosrae's vast marine resources. "The cannery is not a good way to develop the fisheries," said Maragos. "Other types of fisheries development might be better, like fresh or frozen fish. That would create less pollution than a cannery would."

Aquaculture

Aquaculture is another clean, attractive industry that is well-suited for Kosrae. The FSM National Aquaculture Center, which opened its doors in 1991, provides scientific and technical support for aquaculture within the FSM. In 1989, the Center for Tropical and Subtropical Agriculture, the

Pacific Island Network, Sea Grant, and the Community College of Micronesia, with technical assistance funds from the Office of Territorial and International Affairs, created an aquaculture specialist position to develop clam mariculture in the region. The position is now based at the FSM National Aquaculture Center.

The facility boasts concrete raceways, circular tanks, on-site housing, office space and a laboratory. The center provides expertise for assisting the four states in aquaculture development of the species with the highest potential for success. Presently, this includes several species of the giant clam.

According to the center's director, John Riley, the goal of the current program is to produce 100,000 yearlings annually to be used in Kosrae and sent to Pohnpei, Yap, and Chuuk. "The whole program is aimed at reseeding the reefs in Kosrae and the other states," said Riley. The yearlings will then become broodstock on the reefs. The reefs of the FSM, especially those around Kosrae, have become depleted due to overfishing, according to Riley.

"When production becomes routine, we will look at trochus and the green snail, which have had economic success in the other states, and then possibly fish," said Riley.

The center and its activities have so far met with positive reaction from the community. "We're just beginning to spread the word," explained Riley. "We've had a series of municipal meetings to get the support of the community in our efforts to reseed the reefs." The center has also sponsored training sessions and open houses.

Whether aquaculture will become profitable is open to question. "Aquaculture looks like it has a good future," said Skinner. "Hopefully, it will be developed to a certain point, and then be taken up by the private sector. Whether it becomes truly profitable or not depends on what happens in the private sector."

Agriculture

With fertile land and year-round good weather, agriculture is another economic possibility that is being explored. Bananas, taro, citrus and coconut grow in abundance on the island. Because subsistence is the goal for most land use, the predominant method is agroforestry. Row-cropping is an unknown technology. Most farms are back in the mountains, making it hard to harvest crops at a commercial volume, according to Conservation and Development Director Lewis Brooks.

A current project at the Department of Conservation and Development is the taro demonstration farm. The object of the project is to get farmers to understand and appreciate the commercial side of agriculture. By getting them to produce more, and to produce for money, Brooks hopes to bring row cropping and commercialism to reality.

"If we get this farm going, and have regular outgoing shipments (to markets), even though they're small, farmers might pick up on it," said Brooks. "We can help them set up this same type of farm, and that's making one step from subsistence to commercialism."

One problem with getting economic development off the ground has been a lack of entrepreneurial spirit. But, according to Brooks, a resident of Kosrae since 1967, that's because of a lack of successful examples.

"We don't have a single successful farmer on the island who drives a car and has a VCR and a nice house and doesn't work for the government," said Brooks. "Same thing with fishermen. We don't have a single fisherman who is affluent, by Kosraean standards." The Kosraean people are the resources Brooks and his agency are trying to develop. "As soon as we have some people like this, then others will try to follow," he said.

Kosrae's Future

Negative impacts of development

"Those who cannot remember the past will be condemned to repeat it."

... George Santayana, from his book *The Life of Reason*.

Kosraeans need only to look at the recent past to see the negative impacts that can result from development projects. A circumferential road, dredging, and construction of the airport have all adversely affected coastal resources.

"They were warned that if they didn't do (these projects) correctly, it was going to screw up the environment, but they didn't have any experience to necessarily agree with that position," recalled James Maragos, Environmental Officer for the US Army Corps of Engineers at the time of the airport construction. "You have to remember that it was a very pristine place at the time."

As a result of the airport construction, the fish catch at Okat declined by half. It continued to decline at Lelu, where the construction of a causeway had caused extensive pollution and fish migration. Dredging at Tafunsek for the road construction caused severe soil erosion, and more cause for concern. These experiences were bitter lessons for the Kosraean leaders, teaching them to be more sensitive to the environmental impacts of their projects.

The development legislation based on the *Kosrae Island Resource Management Plan* will enable the government to more effectively control large scale actions of developers. In order for it to succeed, the people also will need to curtail some of their own practices. Sand mining and building structures like pig pens next to a stream or shoreline, are prevalent practices on Kosrae. When a person wants to build a house, often they first must construct land on which to build it. When taken together, these practices can have negative environmental impacts. There is also a tendency for people to throw trash away in yards, along roads, or at the beach. But Jack Sigrah, administrator of the Marine Resources Division, says he has seen a change in people's attitude toward environmental conservation. More people are picking up after themselves.



The Kosrae Community Action Program is one of the agencies educating the people about recycling. Their aluminum recycling program is the first in the FSM, and community involvement in the program has increased steadily since it was started in 1990. Still, there is a need for public education.

Madison Nena, administrator of the Kosrae Division of Tourism, is one who is finding it difficult to restrict certain resource uses on people's land. "We talked to a mangrove cutter. He makes his living selling firewood," Nena said. "We asked him if he understood that the government owns this land, and he said 'No, no, this my land.' They still believe the government should never own land. We need a lot of education here."

Nena believes the public concern for the preservation of culture may be one way to inform the public about environmental conservation.

Kosrae is the first state in the FSM to have development legislation that protects history and culture as well as water, land and air. The rest of the country, and even other nations may follow. Gerson Jackson, director of the Office of Budget and Planning for Kosrae, has been invited to several high-level government meetings of late, discussing the options for a national resources management plan as well as helping other states develop their own tailor-made legislation, as he did with Kosrae. But the plan is not a success yet. Its implementation will be the true indicator, and will have an important impact on Kosrae and the FSM.

Jackson realizes this more than anyone else, and has asked for the continued support of PIN, Sea Grant and the Pacific Basin Development Council. "It's important that we start out on the right foot on the implementation phase," said Jackson. "This is the only mechanism we have to assure that what we believe in, we will have in the near and distant future. The plan symbolizes progress as well as an approach to development."

The beginning has been rough. Jackson and the coastal resources management team sent a total of seven drafts to the legislature before it was unanimously accepted. But through the process, they have learned what is important to them, and what sacrifices will have to be made.

Kosraeans want to make sure they are ready for inevitable development, and also emerge from it with their cultural identity intact. They look at the *Kosrae Island Resource Management Plan* as a key to their success.

The next step

Educating the government was the first step in making resource management a priority; the next challenge is educating the public.

"There's a real educational need to get the people up to speed on the kinds of tourism development that are available, and other kinds of economic development. The need for education was the main thing that came out of our study," said Maragos, referring to the recent East-West Center study on tourism.



The majority of Kosrae's population is under 16. The success or failure of resource conservation efforts rests on their shoulders.

More than half of the island's population is under 16, so the future rests squarely on the shoulders of Kosrae's youth. Nena and Simpson Abraham, of the Division of Marine Resources, are actively educating school children about the importance of conservation and preservation. They know the ultimate success of the program rests with them.

Abraham carries out marine conservation education in Kosrae High School. I bring marine resources and species education into the schools," he said. "Kosrae's most important resource is its water — the water is bigger than its land mass. So kids have to learn to make use of our resources without destroying them."

One way he does this is to talk to children about endangered species, like sea turtles and giant clams. "I tell the kids, if you see one of these animals, don't try to catch it, because if you do, your children might never get to see it."

Nena conducts seminars and public presentations on ecotourism and nature-based tourism in all the municipalities. He also started a training program for people who would like to become island tour guides, called EEE (Environmental Educational Evaluation) Tours.

"People are starting to understand," Nena said. "Developing tourism here doesn't mean we have to be like Hawaii or Guam or Saipan. We can have our own type of tourism — it can be in a way that local people can control it."

A five-year plan for tourism, developed with the help of the East-West Center, was adopted by the Kosrae legislature in 1989.

The story of this unique process, from inventory to atlas to multi-disciplinary studies to planning to legislation, could be taken as a Sea Grant success story. "Without the help of Sea Grant, we would never have come to where we are now," said Jackson.

But actually, Sea Grant was just one component in the process. "It was a team



effort. The plan was generated from here, but it was nurtured continually and moved along through their efforts," said UH Sea Grant Extension director and PIN coordinator Miller. "It shows the people of Kosrae were really aware that they needed something like this. And it shows the value of being sensitive to individual differences and cultural differences."

The true success of the project may be the hope that has resulted from it. *The Kosrae Island Resource Management Plan*, and the ensuing legislation was born of the energies of many individuals, beginning with the Kosraean people.

It is a prototype of cooperation that sprang from the desire of a people to protect their environment and cultural heritage from impending development. The future of Kosrae does not lie with US government agencies or ex-patriot specialists. It rests properly with the Kosraean people.

Acknowledgments

This magazine could not have been published without the contributions and guidance of Mr. Simpson Abraham, Mr. Lewis Brooks, Mr. Christopher Dahl, Dr. Jack Davidson, Dr. Lawrence Hamilton, Mr. Gerson Jackson, Mr. Thomas Laughlin, Dr. James Maragos, Dr. Bruce Miller, Mr. Madison Nena, Dr. Rose Pfund, Mr. John Riley, East-West Center, the MacArthur Foundation, the USDA Forest Service, the US Office of Coastal Resource Management, the US Army Corps of Engineers, Guam Coastal Zone Management Program, the Pacific Business Center, the Community College of Micronesia, Continental-Air Micronesia, the National Sea Grant College Program, the Pacific Island Network, and above all, the people of Kosrae.

This work was funded by Program Development (M/PM-2), Sea Grant Extension Service (A/AS-1), and Pacific Island Network (PIN) (A/AS-4) which is sponsored by the University of Hawaii Sea Grant College Program (School of Ocean and Earth Science and Technology), under Institutional Grant No. NA89AA-D-SG063 from NOAA Office of Sea Grant, Department of Commerce. The views expressed here are those of the author(s) and do not necessarily reflect the views of NOAA or any of its sub-agencies. This is Sea Grant publication UNIH-SEAGRANT-MR-93-01.

To order copies of this magazine, please write to:



University of Hawaii
Sea Grant Communications
Office
1000 Pope Road, MSB 200
Honolulu, HI 96822



Printed on recycled paper

Malama Kai Staff:

Jill Ladwig Katter, *Sea Grant
Communications Director*
Elizabeth Reynolds, *Editor*
Diane Nakashima, *Designer*
Naomi Nakakura, *Circulation Manager*
Shane Kaneshiro, *Illustrator*

This edition of Malama Kai was written and reported by Jill Ladwig Katter. "Reef to Forest" was contributed by Christopher Dahl.

