

## Partners #12 Pacific Land-Grant Institutions Web Script – 28 mins.

### Announcer

This time on Partners, it's a voyage to the Pacific islands...  
From a Hawaiian farmer's battle with a banana-killing virus...  
To Pohnpei's hope for economic independence through the power of pearls...  
To a Guam 4-H agent's quest to reach youth-at-risk through fishing...  
Pacific land-grant institutions are hard at work serving the residents of this vast region.

### Dan Kugler/CSREES

We are working with the people there to improve their lives.

### Announcer

Welcome to Partners! In the next half-hour, we'll travel the nation and see breakthrough work in research, education and Extension. That's what CSREES is all about - helping universities generate valuable knowledge for those who need it. And educating our next generation of Americans. And now, it's time for Partners!

### Narrator

For many, the Pacific conjures up images of blue ocean, palm trees and idyllic beaches. But this vast region is much more complex than a simple postcard image. The area is famous for its diverse, indigenous cultures, small rural villages, bustling urban cities and distinctive agricultural endeavors with crops such as papaya, taro and breadfruit.

Far from the shores of the continental United States, is a group of dynamic land-grant educational institutions that are meeting the challenges of this unique region. They are American Samoa Community College, the College of Micronesia, the University of Guam, Northern Marianas Community College and the University of Hawaii.

The Cooperative State Research, Education & Extension Service of USDA has taken a keen interest in supporting various projects of these Pacific land-grant schools.

### Dan Kugler

Our agency has a responsibility to work with the agricultural partnership out there of the land-grants to help those institutions work to make a better life for the people of the islands. These island groups are separated by many thousands of miles of ocean, but they are all tropical and they have issues and needs that are very similar.

#### [Narrator](#)

Because of this, CSREES has financially supported the land-grant educational institutions throughout the region, and ADAP-the Agricultural Development in the American Pacific program. The partnership strives to solve problems involving natural and human resources. For the next half hour, we'll embark on a 7000-mile journey half way around the globe and see just a few of the innovative projects spearheaded by the land-grant institutions of the Pacific.

This is a land of lush vegetation, friendly people, crystal-clear waters, idyllic bays. And while Pohnpei appears to be paradise, like any other place, it also has its problems. Depending on the study, officials estimate unemployment here anywhere from 22 to 70%. Jobs are scarce and subsistence living is a way of life for many.

Some get by producing wood carvings of exquisite beauty. But finding buyers is a problem. Pohnpei's tourism industry is in its infancy. Because of its remoteness, the island only receives about 4 thousand visitors annually. Others who can't find work get by the best way they can. With an average age of 19, Pohnpei has an extremely young population and the need for work opportunities is paramount.

#### [Singeru Singeo/College of Micronesia](#)

We get people calling in almost everyday, looking for jobs- young people, able people.

#### [Narrator](#)

Singeru Singeo works for the College of Micronesia, the island-nation's land grant institution. The Federated States of Micronesia has an agreement with the United States called a "compact of free association". And while the country presently gets annual US aid, the most recent arrangement stipulates that the nation has 18 years in which to become economically independent. In response to this, Singeru and others at the College are exploring new ways to create jobs on the island.

### Singeru Singeo

If we're able to establish some sort of pearl farms in some of the islands based on some technology that's been adapted to simple ways of handling it, then it will be easier for the farms to be established these many outer islands and for young people to have jobs.

### Narrator

Pearls mean big money for some Pacific islands. In the 1970s, French Polynesia began to develop a black pearl industry that now grosses over 120 million dollars annually. Understandably, they have been protective in sharing their production techniques in order to preserve their niche in this lucrative industry.

The black pearl is highly coveted and fetches top prices in international markets. Pearls also have the advantage of not being perishable, and transportation costs from remote islands are minimal due to their diminutive size and weight. With Pohnpei's rich nutrient waters, the stage was set to develop an aquaculture industry. Or was it?

### Singeru Singeo

We knew there were some pearl oysters in the islands, but we couldn't produce enough to have a farm. So that's why we needed a technology to do this.

### Narrator

Enter Masahiro Ito. A marine biologist by trade, Masahiro is an accomplished scientist in pearl aquaculture. But it is his ability to choose appropriate technologies for the developing nations in Micronesia that has proved most valuable.

### Masahiro Ito/College of Micronesia

We don't need no high tech. We just need long lines, ropes and oyster. And they have natural environment to grow oyster and pearls.

### Singeru Singeo

The way we designed the black pearl project was to make it practical-not as high tech. And we're fortunate enough to hire Mr. Masahiro Ito...with expertise in pearl. And was able help transfer this technology that's been kind of secretive for a long time.

### Narrator

With limited resources, Masahiro has established a nursery, trained a local staff, and conducted research with Pohnpei oysters to see which will produce the optimum color of gem. But pearl production is a complex, multi-step process, taking several years to deliver a product.

### Masahiro Ito

The first step is we go to the lagoon, this natural environment, and collect and find the natural oyster.

### Narrator

The goal of this oyster search is not to find pearls. In the wild, only one out of 10,000 oysters may produce a pearl. Rather, these natural specimens will provide the sperm to fertilize the eggs of the next generation of oysters.

### Masahiro Ito

And then bring back to the hatchery here and propagate. At the hatchery we spawn them.

### Narrator

Masahiro has taught his staff low-tech methods to complete the spawning. For instance, since hot sea water is needed to stimulate the secretion of the sperm, Dr. Ito instructs his staff to use abundant local wood for the fire rather than expensive, electric heaters.

Masahiro Ito- This is eggs!

Worker- Eggs?

Masahiro Ito- Yes, eggs.

### Narrator

Each oyster is carefully handled by the workers during the spawning process. 400,000 larvae will be produced from this spawning process. In three weeks, that will produce 100,000 baby oysters, about an inch and a half in diameter.

### Masahiro Ito

After hatchery, we transfer these babies to their grow-out farm, and grow them for 2 years

### Narrator

This is the “ocean nursery phase” of the project. Baby oysters, nurtured in the hatchery, are placed in nets and transported by boat to protected, natural lagoons. The nets are then hung off a series of ropes and buoys where they grow in the nutrient-rich waters of Pohnpei.

### Masahiro Ito

We implant the nucleus and then we produce a final product pearl after 20 months to 24 months.

### Narrator

To encourage pearl production, mature oysters are removed from the nets so that an implant can be inserted. In response to the implant, the oysters begin to produce pearls. The team checks the condition of the oysters and nets monthly, removing sea growth that is detrimental to the process. It is a labor-intensive business, one that promises great financial returns and precious jobs for the people of Micronesia.

### Singeru Singeo

It’s amazing how fast we’ve been able to get this project to where it is today. Last summer, they were able to extract the 10-months-old pearl that showed that pearls of such quality, roundness and right color could be produced in this area using the hatchery technology and all the procedures that he has taught to his boys.

### Narrator

That training has paid off. Masahiro Ito and his staff have established three ocean nurseries. One on remote Pakin Atoll off the coast of Pohnpei will eventually offer its 30 residents relief from their subsistence agricultural existence. Today, however, the crew heads to nearby Parem Island to inspect the oysters there.

### Singeru Singeo

When he (Ito) first came here we agreed that his job is to train Micronesians, to show that the technology can work.

### Masahiro Ito

Check for any loss or nay dead shells.

### Singeru Singeo

That was part of the intention-... to make something very simple so that when people look at it they want to say, “Ah, we can do this in other places.”

We focus on those programs that help raise the level-the quality of life for people whether it's in nutrition, youth, employment-projects like the pearl help with. I really believe without the land-grant funding that we are receiving, I think that we really - a lot of these things cannot be happening.

#### Announcer

The College of Micronesia serves three nations – Palau, the Marshall Islands and the Federated States of Micronesia. It is an area as large as the continental United States with residents speaking seven native languages.

#### Narrator

Here on the “Big Island” of Hawaii, less than a mile from windward coast, is the fertile plantation of the Mauna Kea Banana Company. Its owner, Richard Ha, has been farming on this island for the past 30 years.

#### Richard Ha/Banana farmer

People eat a lot of bananas-it's the most popular fruit. And we grow it here-we're the largest farm in the state, but that also means it's the largest farm in the United States.

#### Narrator

Bananas are popular in Hawaii, generating \$10 million dollars annually. It's easy to see why at the weekly farmer's market here in Hilo. Hawaiian-grown varieties account for most of the bananas consumed by the state's residents. The local crop provides fresh, affordable nutrition for the islanders.

#### Richard Ha

Banana prices haven't gone up in the last 10-15 years-as long as I can remember. But all the other costs have gone up. So we really operate on a very thin margin and we're competing against Central America as far as labor is concerned. So it's a very precarious situation.

#### Narrator

That situation became even more serious when Richard's farm was hit by a disease called banana bunchy top virus or BBTV. As the name suggests, the tops of the banana plants become contorted or bunched up. Inside, the virus

enters the cells - taking over the protein and DNA-synthesizing machinery. This saps the plant of its energy to produce fruit.

### Scot Nelson/University of Hawaii

It means fewer plants and fewer bunches to harvest, so the plants are significantly diminished in their health such that they do not grow and they do not yield properly at all.

### Narrator

Scot Nelson is an Extension plant pathologist from the state's land-grant institution, the University of Hawaii at Manoa. He has been working with Richard Ha on the BBTV problem.

### Scot Nelson

When we find diseased plants, it's important to remove them as quickly as possible from the field so that they do not serve as a source of disease for neighboring plants.

### Richard Ha

We found the banana bunchy top virus on our farm at Kao and it was widespread enough that it was going to be impossible to just take out the ones that were infected and still have a viable farm. So we took the whole thing out and to do that out of the blue is kind of – it gets your attention.

### Narrator

The infestation cost Richard 100 acres of productive trees. In the competitive banana business where daily operations are finely-tuned to shave even a cent off the per/pound price, the impact was dramatic.

### Richard Ha

One day you're supplying people that you've been supplying for 20 years. Then the next day you're saying "I don't have any fruit."

### Scot Nelson

Bananas are probably one of the most important food crops in the Pacific. If we can develop some kind of technologies to prevent banana bunch top from destroying this valuable food source. What it means is almost indescribable to the people of the Pacific ocean because they rely so heavily on this plant for everyday food.

### Narrator

Back at the University of Hawaii's main campus in Honolulu, scientists and students from the College of Tropical Agriculture and Human Resources are attacking the problem. The research, funded by CSREES, is focusing on how the virus spreads to banana plants. Part of the project incorporates Global Positioning Satellite technology.

### Rodrigo Almeida/University of Hawaii

We gave growers that are participating in the project GPS units like this one and they go out in the field they are sampling for, looking for sick plants with bunchy-top they ...press a little button and they gather the GPS position of that one plant. The farmers gather the data and we use it to analyze the temporal & spatial distribution of the disease. It's basically how the disease is spreading over time out in the field.

### Narrator

Back at the lab, co-investigator Mark Wright plots each plant on a grid. Distances between the plants are precisely measured, and the spread of the virus, caused by the banana aphid insect, is tracked.

### Rodrigo Almeida

We found that sick plants were found throughout the field. That's a little bit different than we expected because it indicates that the aphids may be flying in from outside into the fields rather than spreading within. What we hope is that at the end we can come up with a system so that if the farmer finds one sick plant, he can cut that one plant and maybe cut a few more plants surrounding it to avoid the spread of the disease in the field. So it's basically a way of reducing the spread before the symptoms show up.

You want to be sure you have the least number of plants removed so that the farmer is still profiting from this management strategy, but you also want to be sure that he's reducing the amount of disease out in the field.

### Narrator

Finding that fine balance is just one part of the research. Rodrigo and his team is also taking on *Pentalonia nigronervosa* –the banana aphid responsible spreading the virus. This slide here shows one approach to decreasing the insect's numbers.

### Rodrigo Almeida



That's a little banana aphid which was inoculated or infected with a fungus. And the fungus is growing on the aphid and killing the aphid. We're looking at some fungal bio-control agents that may help control agents that may help control aphid populations and there's also a little fly that can kill the aphids that we're doing some research on.

Banana bunchy-top was a clear problem, had been present in this state for awhile, but there was very little to know about it. Because it involves an aphid that transmits a plant virus and it's an important crop for Hawaii...

#### Narrator

Back on the Big Island, growers like Richard Ha are glad to work with the University of Hawaii in finding solutions for virus control. That effort is just in time. In the aggressive world of banana production, strong, healthy plants are vital to their future.

#### Richard Ha

The disease is manageable. It's just that it's a thin-margin business and you've really got to be careful and there's not much room for error.

#### Announcer

With CSREES support, ADAP - the Agricultural Development in the American Pacific program - has started many projects - from satellite communications between the 5 land-grants to healthy living in the Pacific.

#### Narrator

Saipan is the most populated island in the CNMI, the Commonwealth of the Northern Mariana Islands. But much of this US territory's land is rural, with rich farms meeting blue ocean.

This is basic island farming, where many supplement their food supply with a pig or two. With veterinarians in short supply, especially on the more remote islands, CSREES has funded an innovative program that teaches local people to become paravets - trained volunteers who help farmers with livestock care.

#### Jeffery Castro/Paravet

I was born here-raised here. All of my family-my grandfather is a full-time rancher, full time farmer. We live off the land.

### Narrator

Jeffery Castro has just completed the paravet training administered by Northern Marianas Community College, the local land-grant institution. Today, he visits George Salas to take a look at his pigs.

### Jeff Castro & George Salas/Saipan farmer talking local language

### Jeffery Castro

There's a real demand for paravets. There are so many farmers that I spoke to, and ranchers, that have no idea what to do, where to seek help, who to talk to in case there's an outbreak or a sickness with their livestock.

We're like Extension agents for the veterinarians. In another words, we cannot just proceed on to do what we're suppose to do on the ranch and how to assist a farmer without consulting first with a licensed veterinarian

We don't charge any fee. We're just here to help the ranchers themselves so that they can also learn how to treat there animals.

### Narrator

The first paravets of this program were trained in America Samoa. But the project extends beyond the American land-grant system. The Fiji-based Secretariat of the Pacific Community was instrumental in the project's curriculum development, and is now administering the project to other islands in the region.

Having a safe, local food supply is fundamental to all the islands of the Pacific. With the popularity of pork and beef here, healthy livestock is essential.

### Eddie Avegalio/American Samoan farmer

We were able to get a lot of help from the land-grant as far as husbandry of the pigs and using of the sows, composting. We've been quite grateful for their assistance in helping us maintain our hog operation.

### Narrator

Back in Saipan, it's the weekend and family seaside picnics are in full swing. Having a paravet program will help ensure safe meals for all residents here.

### [Allan Sabaldica/Northern Marianas Community College](#)

For the local people of the CNMI (Commonwealth of the Northern Mariana Islands), they can expect more services from animal health, animal nutrition, animal husbandry-management.

### [Narrator](#)

In addition to being a veterinarian, Allan is an Extension livestock specialist. He led the paravet training in the Northern Marianas that drew students from many of the surrounding islands.

### [Allan Sabaldica](#)

I won't be able to influence a lot of local people in regards to animal health because I am limited in budget. I am limited in time. With Paravets in Rota, Tinian and Saipan, this is going to be my Extension hand. It will help me a lot. More access. More inputs. More outputs. And it will gradually improve the livestock industry.

### [Narrator](#)

Back at George Salas's farm, Jeffery inoculates some of this year's new piglets.

### [Jeffery Castro](#)

I really love to help ranchers. And I really love to help educate them in a way but to try and consult with them what's happening to their livestock and what they can do to try to prevent sicknesses.

### [Announcer](#)

As of early 2005, the Paravet program has certified over 50 new paravets now serving farmers throughout the Pacific region.

### [Narrator](#)

Today, this group of 4-Hers is boarding Island Girl at the Agana Boat Basin Harbor. They are part of an outreach project developed by the University of Guam to teach teens life and leadership skills through fishing. Volunteer and former member, Paul Long.

### [Paul Long/4-H Volunteer](#)

It's great when you know how to catch something and you go and catch something you're looking for. So I try to pass on what I know so that they can have the same experience.

#### Narrator

Paul and the group are out for a day of deep sea fishing off the coast of Guam. These are serious waters. The largest Pacific marlin ever caught came from here. So before the kids embark on this adventure, they are well schooled in the fine points of fishing.

#### Paul Long

I learned how to tie lures. I learned how to tie knots. I learned about tides in the water. About what fish come out at what times.

#### Narrator

Paul went through the same training as these teens, years ago when he was only 10. Now, he teaches others what he knows about fishing.

**Paul Long**-Which one do you want to be on your outside?

**Student**-Umm, this one

#### Narrator

Members are taught how to make their own lures, take care of equipment, and learn about water safety. Guam, a US territory, is like many communities on the American mainland. There's traffic congestion, fast-food strips, and the usual problems that can put youth at risk. The 4-H fishing program help keeps their members occupied.

#### Mona Duenas/parent of 4-Her

You know when you have youngsters and they get bored and stuff like that – they know that there are other things out there other than computers, shopping. There's outdoors!

#### Paul Long

Fishing helps them to wanna just fish rather than go out and do other things.

#### Guam Fish Broker

I would be the person that you would sell your fish to if you were interested in selling your fish.

### Paul Long

A lot of kids fall into drugs and alcohol-drugs most especially since we've joined the program it's "Why do that?" We'd rather go have fun fishing...

### Narrator

The group hears from a local fish broker about the economics, processing and marketing of fish. This holistic exposure to the subject peaked the interest of one of the program's former members. He is now pursuing a master degree in marine biology at the University of Hawaii. And the cultural aspects of fishing are also taught. Guam has a rich history of harvesting the sea. Here, Paul tries to master *talaja* throwing of the surround net, a practice that is rapidly vanishing on the island. When the program started 24 years ago, it only demonstrated the cultural aspects of fishing. Since then 4-H program leader, Ted Iyechad expanded the venue to what it is today.

### Paul Long

He's always willing to lend an open hand to me, always willing to give me advice, just offer me opportunities. So I owe a great deal to him.

### Ted Iyechad/University of Guam

They've learned the basics, and the basics is hard work. You've been taught from the beginning, you always have to work to be successful. You'll never be successful unless you work hard. It's really linking experience and learning to life skills. And that's what we wanted to do with the kids.

### Narrator

The partnerships Ted has established with volunteer trainers and local vendors, like the Big Hook Fishing Shop, have made this program possible. 4-H'ers receive a discount on all gear in the store.

### Ted Iyechad

How we work with the boat, how we work with the stores – It's really a community project. But CSREES... provides really the basic funding for our staffing.

### Narrator

Back on the boat, the fish are starting to hit. And now the kids have a chance to put their newly-learned skills to work.

Student- I'm tired!

Ted Iyechad - Go for it! Faster!

(cheers from crowd)

Student - That's a workout! (laughs)

Narrator

Soon, there's another strike! This time it's a mahi mahi with a lot of fight!

Ted Iyechad - Come on! Come on!

Deck hand- Keep it down-like right there

Ted Iyechad -Faster! It's jumping! It's jumping! It's jumping!

Narrator

At times, teamwork is essential in bringing in the big one.

Student - My hair's stuck! ..... It's hard!

Student - This is my helper!

Narrator

It has been a busy day aboard Island Girl. Five fish were landed and a five-foot shark was brought to the boat, but then released. Afterwards, the gang gathers on the bow to swap fish stories and tell a few jokes. For Ted Iyechad, it's been another successful day for his group to learn on the water.

Ted Iyechad

It takes all of us – both Extension and research- the whole community to provide for program like this to hopefully help our young people succeed in life.

Narrator

From 4-H fishing on Guam, to the Paravet program of American Samoa and Saipan...

From the black pearl-oyster farm of Pohnpei, to the banana disease research on Hawaii ...

the accomplishments of the Pacific land-grant schools are many and diverse. And CSREES is dedicated to supporting their quest to help people of the Pacific, now and in the future.

[Announcer](#)

On the next episode, Partners explores the 1890 Institutions of the land-grant system

[Juan Williams/author](#)

These are institutions that are willing to serve people. To allow people, who otherwise might be denied education, accessibility to that education. And I think it is a gift.

[Announcer](#)

From North Carolina's A&T's research with biosensors that speedily detects food contamination

to Prairie View A&Ms outreach to urban teens that's creating the next generation of entrepreneurs

to University of Arkansas-Pine Bluff's progressive aquaculture program for river delta farmers

1890 land-grants are serving the people of America. That's all next time, on Partners