

In-Depth NONPOINT SOURCE SUCCESS STORY

Highlighting the People Behind the Progress

Community Efforts Improve the Achugao Watershed

TANAPAG VILLAGE, SAIPAN, COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

A collaboration between community members and local government officials led to voluntary efforts to reduce water pollution in the 1,607-acre Achugao watershed on the island of Saipan. A survey team from the Commonwealth of the Northern Mariana Islands Bureau of Environmental and Coastal Quality (CNMI BECQ) discovered wastewater and other pollution sources entering the watershed's streams. To improve watershed conditions, the team met with Tanapag villagers, explained the causes and effects of the pollution and helped them obtain funds from the local government and the Natural Resources Conservation Service (NRCS). The community responded by conducting watershed cleanups and implementing practices to improve stream and coastal water quality.

Partners in Success



Tanapag Village Community *Neighbors Making a Difference*

Community members responded to the call to clean up the watershed by removing debris and pollution.



Martin Naputi, NRCS *Federal Employee Connects with Landowners*

Martin worked alongside his district conservationist to conduct outreach and provide technical assistance.



Morihna Iguel, Piggery Owner *Citizen Supports Action*

Mrs. Iguel, a longtime resident of the watershed, worked with NRCS to build a new dry-litter piggery system.

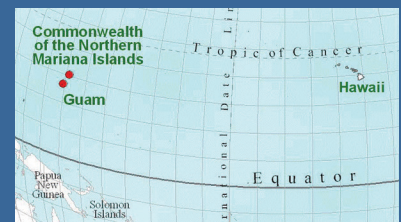


Clarissa Bearden, CNMI BECQ (Former) *CNMI Contact Fosters Communication*

Clarissa worked with federal and local partners to implement projects and connect residents to resources.

Success Story *Highlights*

- **Pollutant of concern:**
Bacteria, nutrients, dissolved oxygen, biological conditions
- **Practices implemented:**
Sewer leak repair, dump site cleanups, public sewer line connection, outhouse removal, improved animal housing, vegetation plantings
- **Waters restored/improved:**
Achugao, Dogas and Agatan streams
- **Key elements of success:**
 - » Sanitary survey
 - » Public outreach, including face-to-face interactions and offers of technical assistance and funding
 - » Local buy-in and support from Tanapag villagers
 - » Widespread community participation in on-the-ground pollution reduction and clean-up efforts



Basin Description

The Achugao headwaters begin on Wireless Ridge and flow into Tanapag (also called Saipan) Lagoon. Large grasslands cover the upper watershed along Wireless Ridge. Three major stream systems flow from the ridge to the lagoon, starting with the Agatan and Dogas streams in the southern subwatershed and Achugao Stream in the northern subwatershed.

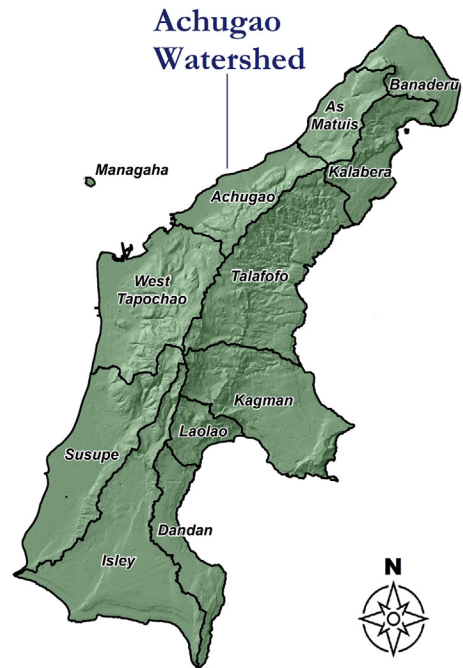
The Achugao watershed hosts diverse terrestrial and marine habitats, including limestone forests, grasslands, freshwater and brackish wetlands, mangroves, seagrass and coral reefs. This watershed includes some of the largest and most consistently flowing stream systems in CNMI.

Identifying the Problem

Coastal waters near the Achugao watershed were first listed as impaired in 2004 due to persistent exceedances of fecal indicator bacteria, poor biological conditions within the lagoon and low dissolved oxygen levels from elevated nutrients. Pollutant sources in the lower watershed included illicit discharges, wastewater and stormwater from outhouses, animal pens, outdoor kitchens, feral animals and rubbish areas. In 2013, two significant pollution events occurred in Dogas Stream, just south of Achugao Stream: a fish kill in April and a raw sewage spill in late December. Prompt action was necessary to protect public health and the environment.

Facilitating a Solution

In 2013, the BECQ's Water Quality Surveillance/Nonpoint Source Program responded to pollution concerns by expanding its existing marine water quality monitoring program to create a "Stream Dream Team." In the Achugao watershed, the new team focused on assessing upland areas to pinpoint the sources of water pollution reaching the impaired coastal waters. The team mapped the area and conducted a sanitary survey to identify sources. These included piped discharges into the stream bed from a family toilet and kitchen sink, wastewater discharges from outhouses and piggeries and leachate from several household waste dump sites. Instead of issuing penalties for violations, the Stream Dream Team reached out directly to members of these low-income communities to find and fund solutions.



Commonwealth of the Northern Mariana Islands: Saipan watershed map. For more details, access the Interactive [Watershed Map Viewer](#) for Saipan.

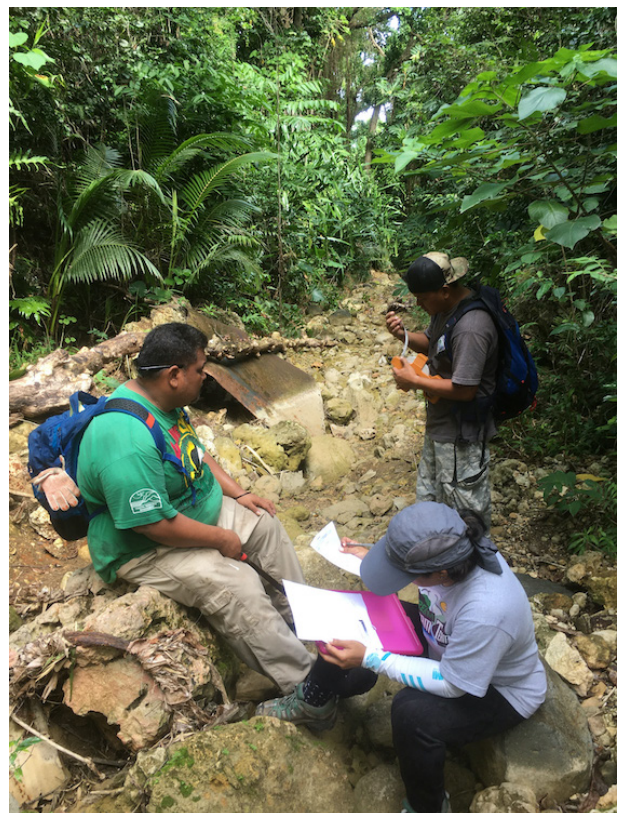


Photo: BECQ

The Stream Dream Team assesses the Achugao Stream, mid-watershed.

A Community-Based Approach

To inform and engage the community members, the Stream Dream Team conducted in-person visits with local families. In these meetings, the team explained the hazards of illicit discharges and helped homeowners find low-cost alternatives for sanitary treatment of wastewater, such as compost toilets and dry-litter piggery systems. Two households agreed to host a “Coffee Klatch,” inviting neighbors to learn how their activities could be polluting the stream and discover how government partners could provide funding and technical resources to help remove pollution and improve their living conditions.

With support from a village leader, the team later held a Village Assistance Forum after a church service. The event brought together representatives from local and federal partner agencies with 19 heads of household to explain available financing programs. Agency staff helped attendees fill out applications for various programs, including free sewer hook-ups, funds to build sanitary dry-litter piggeries, home improvements and vouchers for electrical payments and upgrades to energy-efficient appliances.

Neighbors Making a Difference

The Tanapag community responded to the team’s outreach efforts and rallied to address the problems. Residents cleaned up illegal dump sites and beach areas. They moved animals away from the stream and changed their outdoor water disposal practices. Four homes were hooked up to the sewer line and two outhouses were removed. Three families used NRCS Environmental Quality Incentives Program (EQIP) funds to build dry-litter pens in their subsistence farming piggeries.



Photo: BECQ

Villagers fill out funding applications at the Village Assistance Forum.



Photo: BECQ

Morihna Iguel meets with a government representative to discuss programs.



Photo: BECQ

BECQ staff and community members help clean up an illegal dump site in the Achugao watershed.

THE PEOPLE BEHIND THE PROGRESS

Martin Naputi, Natural Resources Conservation Service *Federal Employee Connects with Landowners*

Martin Naputi has been with the U.S. Department of Agriculture NRCS for more than three decades. At the time of the Achugao watershed project, he served as a soil conservation technician. Martin is now working as a civil engineer technician. He worked closely with the district conservationist, who spearheaded the outreach efforts with villagers.

- ***How did you become involved in the effort to improve water quality?***

Martin: As soon as my district conservationist gathered information from preliminary meetings with the public, he approached NRCS staff, and we identified ways to address the issues in the watershed.

- ***What were the key resources the villagers used to address problems?***

Martin: At the time, we had funding from EQIP that was perfectly aligned with the Achugao Watershed Committee's goals. From there, we created a conservation plan and completed some endangered species and historical preservation reviews. I collaborated one-on-one with the villagers who ran piggery operations in the watershed, and I worked with them to install dry-litter piggery systems.

- ***What challenges did you and your clients face?***

Martin: Our clients faced financial challenges, but they wanted to build piggery systems that would protect the environment. We were fortunate that EQIP funding provided financial assistance. Also, some residents didn't have the necessary land ownership documents because they acquired the land culturally, which is by word of mouth. Fortunately, even in these cases we could provide technical assistance, giving them free examples of dry-litter piggery designs that they then went on to install. Some people are still trying to acquire their land ownership documents so we can more formally help them.

- ***What was the biggest surprise while working on this?***

Martin: Everybody wanted to help! Our clients understood the importance of adapting their farming processes and were invested in getting the environment back to its original state. Everyone we reached out to was willing to learn about the issues and opportunities, and they remained very involved in our process.



“Our clients were invested in getting the environment back to its original state.”

Martin Naputi



Wastewater leaks from an eroding piggery in the Achugao watershed. This piggery owner moved the pigs to a new location away from the stream.

Photos: NRCS

Morihna Iguel, Community Member and Piggery Owner

Citizen Supports Action

Morihna Iguel has lived in the Achugao watershed for decades. During the Achugao project, she and her late husband worked in tandem with the NRCS to implement a dry-litter piggery system that remains in place and is expected to last for generations.

- ***What do you love most about your community?***

Morihna: I've been living here in the watershed for many years, since my eldest child was born. Now, I'm watching my grandkids grow up here. What I love most about our community is how we feel like one big family, connected by our shared culture.

- ***Which conservation project did your family implement?***

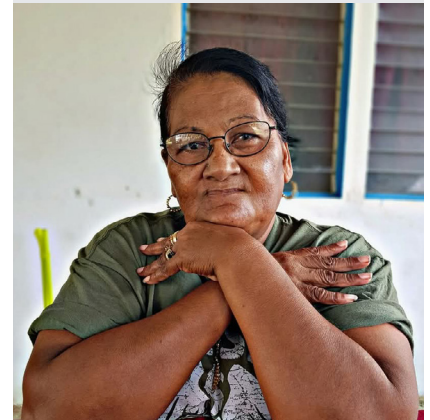
Morihna: My family and I enjoyed getting involved in the dry-litter piggery project. We faced some challenges during the program, but we're thankful to the amazing staff at the U.S. Department of Agriculture and Bureau of Environmental and Coastal Quality for making things so much easier for my family and me.

- ***How has the project affected the watershed?***

Morihna: The conservation practices we've implemented have significantly transformed the watershed. We are thrilled to see a substantial reduction in plastics, trash and debris floating in the streams and the coastline areas near the watershed.

- ***What encouragement would you give to other community members?***

Morihna: Living in the Achugao watershed has really helped our family and me understand the importance of keeping the watershed clean and the benefits of our dry-litter piggery. It's been a great experience!



“The conservation practices we’ve implemented have significantly transformed the watershed.”

Morihna Iguel

The Iguels and NRCS installed a dry-litter piggery operation with four stalls in 2019.



The finished piggery includes a waste storage facility, roofs and covers, roof runoff capture structure, and heavy use area protection.



Wood chips serve as bedding material while also absorbing the pig waste at the lower end of the concrete slab stalls.



The Iguels collect and store the wood-chip waste in the piggery's block-bin storage facility for later use as compost for plants.

Photos: NRCS

Clarissa Bearden, CNMI BECQ (Former)

CNMI Contact Fosters Communication

At the time of the Achugao watershed project, Clarissa Bearden served as the manager of the BECQ water quality and nonpoint source pollution program.

- ***How did you become involved in the effort?***

Clarissa: My team and I were assessing impaired sites, including one in Tanapag in the Achugao watershed. We conducted a sanitary survey of the watershed and identified activities that contributed to the biological violations found in the beach area. Most of the illicit discharges we saw originated from pigpens, outhouses and gray water from outdoor kitchen sinks.

- ***How were you able to engage the community?***

Clarissa: Initially we went to the houses of people living next to the streams. We spoke to them and shared brochures describing the activities that could affect water quality. The community members were concerned because the impacted beach area was where they spent most of their time recreating on weekends. They kindly accepted us into their homes and talked to us. It was very fulfilling work.

- ***What challenges did you and your clients face?***

Clarissa: Some people didn't have transportation, so we drove them to agency offices to apply for grants. For example, the NRCS was giving out grants for dry-litter pigpens, but some families would not have been able to get to the agency offices to apply. Another major issue was that a lot of the villagers lived on family land and did not have land ownership documents. This did not stop them from participating, though. They were more than happy to move their piggeries away from the streambed.

- ***What was the biggest surprise while working on this?***

Clarissa: People were very willing to be a part of the water quality improvement effort. They were receptive to the work we wanted to do and helped us willingly, even though they knew we could impose fines if we wanted to. They voluntarily collaborated with us on finding and implementing solutions. It was very fulfilling to see the impacts of everyone's hard work when the water quality improved.

- ***What do you want other people to know about this effort?***

Clarissa: I am very proud of this project. I want people to know it takes a community working together to clean up a polluted area. We could not have done it by ourselves. We needed the community to join us and make it happen. Working with them over the span of a year and seeing the water quality improve has been amazing.



“It takes a community working together to clean up a polluted area.”

Clarissa Bearden



Debris dumped in the streambeds (top) contributed pollutants to downstream beaches. The community members rallied to clean up these areas (bottom).

Photos: BECQ

Progress Underway

Water quality has improved locally after the community outreach and engagement efforts in the mid-2010s. Visible pollution problems, such as the 2013 raw sewage pollution event in Dogas Stream, captured the community’s attention and were quickly addressed. The amount of waste and debris flowing downstream and into coastal waters has declined as a result.

Data show that bacteria levels in the south Achugao watershed have dropped overall but continue to fluctuate. The chart below shows that exceedances of the enterococci bacteria water quality standard dropped at the Tanapag Meeting Hall water quality monitoring site WB07 from 2014 to 2020.

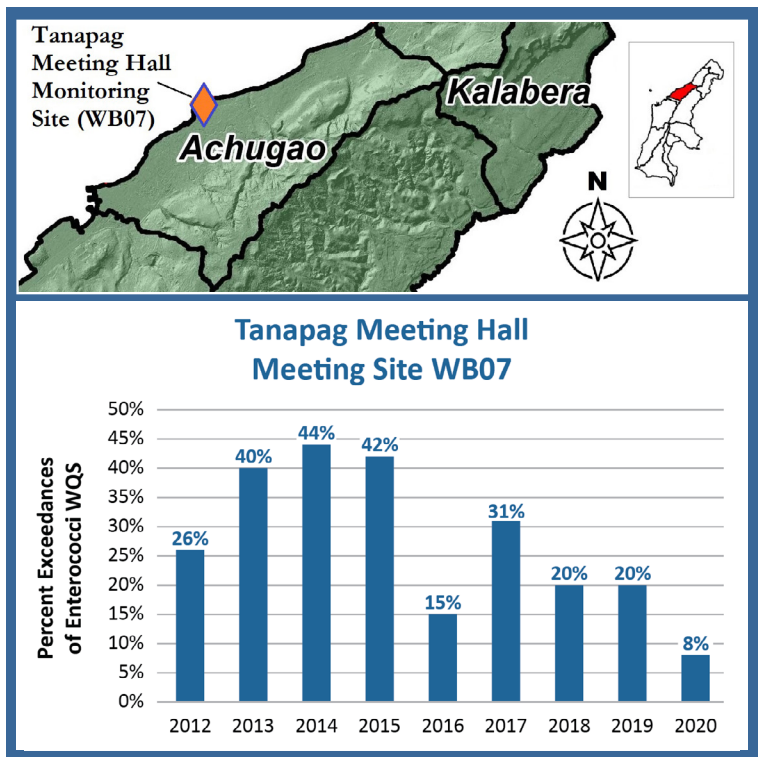
However, water quality problems/elevated bacterial levels persist due to new sources of pollutants and the lack of maintenance of existing water quality improvements. Data at site WB07 indicate that the percent exceedances increased in 2021 and 2022 (to 23% and 48%, respectively), before dropping again in 2023 to 16% exceedance. Therefore, BECQ has not yet been able to remove the Achugao watershed coastal segments (segments 20A North and 20B South) from the list of impaired waters. The staff continues efforts to identify and address pollution sources.

A 2017 coastal waters bacteria total maximum daily load was developed for Saipan, which includes the two Achugao watershed segments. Since then, BECQ has developed an Achugao-specific watershed management plan for 2020–2030 and an assessment report outlining restoration opportunities and management priorities for water quality improvement. Some key recommendations outlined in the documents are to continue community outreach and capacity-building, support small-scale water quality and restoration projects, and address sediment and bacteria from new development. The community and BECQ will use the total maximum daily load report and the watershed management plan to help guide future efforts to reduce water pollution.



A pollution event in Dogas Stream (top) in 2013 helped to prompt actions to identify and remove pollution sources in the larger Achugao watershed. After community efforts, water quality has improved (bottom).

Photos: BECQ



Exceedances of the enterococci bacterial water quality standard (130 most probable number/100 mL) at the Tanapag Meeting Hall (2012–2020).

Looking Ahead

The success of collaborative, one-on-one community outreach efforts, such as the Village Assistance Forum in Tanapag, has become a model for outreach in other low-income villages located within CNMI's impaired watersheds. Tanapag Village residents have even encouraged families living outside the Achugao watershed to contact the Stream Dream Team for help in cleaning up their environment.

Work continues in the watershed to assess and address pollution problems as they arise. The community's willingness to make improvements and protect the watershed has reduced debris problems and improved water quality. The villagers can once again enjoy their streams and shorelines, thanks to the ongoing dedication and engagement of individual residents, the determination and ingenuity of the BECQ's Stream Dream Team and the financial and technical support from the following sources:

- CNMI Department of Public Works, Energy Division
- CNMI Department of Community and Cultural Affairs, Low Income Home Energy Assistance Program
- Northern Marianas Housing Corporation
- U.S. Department of Agriculture NRCS, EQIP
- U.S. Environmental Protection Agency, Clean Water Act Section 319 Program



Photo: BECQ

Grasslands cover the upper watershed.



Photo: BECQ

Looking across the Achugao watershed towards the Tanapag Lagoon.

Learn More

The following resources include more details on the pollution problems and solutions in the Achugao and other Saipan watersheds.

Publications and maps

- [*Achugao Watershed Existing Conditions and Opportunities Interim Report*](#) (2020)
- [*Achugao Watershed Management Plan 2020–2030*](#) (2022)
- [*Interactive Watershed Map Viewer*](#)

Watershed protection videos

- [*“Stream Restoration: It Takes a Village”*](#) – Highlights the Stream Dream Team's community outreach efforts.
- [*“Animal Wastewater Hazards”*](#) – Explains how animal wastewater can enter streams and cause illness in swimmers.
- [*“Imagine”*](#) – Encourages people to pick up litter.

Websites

- BECQ [*Division of Coastal Resources Management*](#)
- BECQ [*Water Quality Surveillance and Nonpoint Source Branch*](#)



Children run into the Saipan surf (from BECQ's "Imagine" video).



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