Letter from the Director

Aloha,

One of our industry stakeholders recently brought to my attention that a shortage of freshwater prawn post larvae is having a detrimental effect on the local farming industry. As you may know, Hawaii was a leader in the early development of freshwater prawn farming technology, and it would be shame to see the industry shrink as a result of farmers having to import post larvae. While CTSA is proud to support the development of new aquaculture industries, we must also meet the needs of established industries that are already benefiting our economy.

Currently, Hawaii's freshwater prawn industry generates about $2 million per year. Although this may be considered small by mainland standards, it is significant enough in our local aquaculture industry to warrant assistance. The Anuenue Fisheries Research Center (under the Hawaii Department of Land and Natural Resources) promoted and supported the development of Hawaii's prawn industry for many years. Unfortunately, the Center significantly scaled back prawn activities in 1994 due to the concern of a potential conflict between public and private hatcheries; accomplishments from prior efforts may soon vanish if an effective solution is not found. Timing is always a challenge when it comes to transitioning from public to privately funded hatcheries. A close dialogue among all stakeholders is essential, which is why CTSA consistently promotes the idea of "partnership for success."

While this is a good lesson for us as we develop aquaculture in the region, I am also currently assessing ways in which CTSA can use our limited resources to help the fledgling freshwater prawn industry. I welcome your thoughts and suggestions on the subject. Aquaculture stakeholders understand that industry development is critical to the security of the global seafood supply, but we must ensure that each target species and resulting industry are developed in a sustainable manner. Only then can aquaculture create lasting results.

Mahalo,
Cheng-Sheng Lee
Executive Director, CTSA

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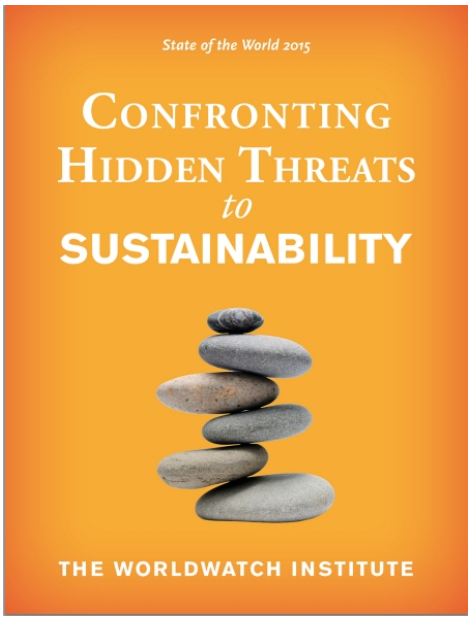
Pacific Island Communities Hold Untapped Potential to Mitigate Threats to the Ocean and Food Security

by Meredith Brooks, CTSA staff

Worldwatch Institute recently released its 'State of the World 2015' report. The report is the latest in

a long line of publications that discuss the effects of destructive human behavior on the Earth and oceans, and sounds the alarm for us to take immediate action. "As our negative impact on the oceans has grown, so has our understanding of the myriad (of) ways in which the health of the marine environment determines our own," writes contributing author Katie Auth. "The combined stresses of human activities like overfishing and climate change now pose distinct and intensified threats to marine systems."



Overfishing is a significant crisis in international waters. Thankfully here in the United States, stricter fishing regulations, programs to rebuild fisheries, and an emphasis on ecosystem-based fishery management have shown positive results. According to the NOAA 2014 Status of Stocks report, the amount of overfishing and overfished stocks continues to decrease, and in fact has reached an all time low. At the end of 2014, only 26 stocks (out of 308 stocks with known status) were on the overfishing list and 37 stocks were on the overfished list. In addition, 37 stocks have been rebuilt since 2000. Although this is promising, many countries are exempt from annual catch limit requirements. They do not abide by the same standards set forth from NOAA, which has limited ability to control overfishing in international waters.

"Marine ecosystems and individual organisms that already are weakened by overfishing become less resilient and more vulnerable to disruption, especially because environmental change is occurring so rapidly," writes Auth. As the burden from overfishing and climate change increases on marine systems and species, global food security and human health also become threatened. Worldwide, three billion people depend on fish as their primary source of protein and fundamental nutrients. In addition, millions of workers rely on the fisheries industry for their livelihoods. If humans continue impacting the ocean at the current pace, we could see drastic changes to the security of our seafood supply in the near future.

Food security is an issue that must be addressed with a multi-faceted, interdisciplinary approach. One industry that is already a major player in helping to relieve pressure on wild fish stocks is aquaculture. Global aquaculture production (animals only) increased at an average annual growth rate of 6.1 percent from 36.8 million tons in 2002 to nearly 67 million tons in 2012, according to the Food and Agriculture Organization of the United Nations (FAO). The expansion of aquaculture production has helped meet growing demand for edible seafood as the output from capture fisheries has leveled off, and about half of the seafood consumed worldwide now comes from aquaculture. The industry is steadily gaining in popularity for its capability to supply sustainable seafood, increase economic stability, and restore and preserve ecosystems through stock enhancement and other activities. Development of aquaculture continues to grow in importance in the Pacific region and across the U.S. While mainland farmers have the land space and capacity to produce large quantities of seafood, farmers in the CTSA region are limited and large-scale development is unlikely. Thus, our region must look for other ways to make an impact on the future security of our local seafood supply. The answer likely lies in tapping into traditions within Pacific Island communities.

Most shrimp consumed worldwide now comes from aquaculture

Community is the foundation of livelihood across the Pacific Islands. While each community is different, most are steeped in traditions of working together for the benefit of everyone. Centuries ago in Hawaii and other Pacific Islands, efficient land and water management systems provided for everyone's basic needs, including food. Nowadays, community farming has mostly fallen by the wayside, but the overall sense of community throughout the region is still very strong. The right approach to new development, and guidance via technical assistance, can help island communities

reclaim the food (and economic) independence that was once a defining part of their identity. CTSA has supported some of these efforts, most notably in Micronesia, where extension agent Masahiro Ito established a sea cucumber and pearl oyster hatchery and trained local Micronesians to oversee and conduct its operations. Those technicians in turn, trained community members who now operate community farms. In addition, recent projects in the Marshall Islands and Hawaiian fishponds have allocated support for training to catalyze community-based food production efforts.

Community farmers on Pakin Atoll, FSM

Though CTSA supports this work, we need to do more to shift our industry to these types of activities, and to employ an integrated approach toward becoming a food secure region. Most Pacific Islands import the majority of their food. In Hawaii, approximately 90% of food is shipped from thousands of miles across the sea. This is disappointing for a location that has favorable growing climate, pristine natural resources, and a rich tradition of sustainable food production.

The isolation of our region presents us with unique challenges and opportunities. Although we will likely never be able to produce as much product as our mainland and international counterparts, our region can impact global food security by demonstrating how efficient small to medium-scale farming can feed and support communities. Results from these efforts can also go a long way to relieve pressure on natural stocks, limit dependency on imported goods and fossil fuels, and overall help in the restoration of our ocean. CTSA is looking forward to the day when our industry fully embraces the inherent resources of our region to make significant and lasting positive impacts.

Quotes in this article are from the Worldwatch Institute Aug. 18 news release about the 2015 report.

Regional Aquaculture Announcements & Reminders

Announcing the NOAA Aquaculture Photo Contest!

Do you have great aquaculture photos or video shorts? Enter them in the NOAA Aquaculture Photo Contest! The photo contest recognizes photographers and videographers who have captured images or short videos of aquaculture and the people, science and technology behind it. Submit by September 13, 2015. Winners will be announced over Aquaculture Week,September 21-25, 2015. Read the Photo Contest Guidelines here. Submit an image/video to the contest here.

Share Your Expertise with FishEthoBase until August 31

From Aquafeed.com staff, 8/19/15. FishEthoBase, the first database on fish ethology, has extended the feedback period for the initial three species covered, to 31 August. The database is designed to collect, systematize and make available through open access, all ethological knowledge to be found on fish in the wild and in captivity, with a focus on farmed species in order to help improve fish welfare in aquaculture and avoid practices that harm fish. Three species have been covered so far, Atlantic salmon, Nile tilapia and Gilthead seabream, and four more are in development. A section on feed is included for each fish. Full details here.

Apply by Sept. 1 - Aquaculture Researcher Position at University of Hawaii

The University of Hawaii's College of Tropical Agriculture and Human Resources (CTAHR) is seeking to hire an **Assistant Researcher** for the Human Nutrition, Food and Animal Sciences department. The position will begin approximately January 2016, or soon thereafter. For best consideration, all application materials should be submitted by September 1, 2015. Click here for more information and to apply for the position.

Apply by Aug. 31 - SeaGrant Extension Agent at University of Guam

The University of Guam is seeking an **Assistant to Associate Professor** in Extension and Outreach who will provide high quality, responsive, science-based, and effective programs under the CNAS SeaGrant portfolio. Applications due by August 31, 2015. Employment period to begin on November 1, 2015 or earlier. For more information and to apply for this position, please click here.

AquaClip ~ Norway ~ BioMar Project to Optimize Feed Efficiency

from www.worldfishing.net. Aug. 26, 2015

Scientists and industry are joining forces in a new project to improve feed for commercial fish farming in order to improve protein digestibility.

In the ExiPro project - funded by Innovation Fund Denmark - scientists from Aarhus University, University of Copenhagen, the Technical University of Denmark, and fish feed producer BioMar, hope to reduce the impact on the aquatic environment, improve fish growth and save the industry DKK50m ($7.5M US) a year.

The scientists say that if the protein is not fully utilized then surplus nitrogen will end up in the aquatic environment, and therefore protein digestibility needs to be optimized.

The project partners expect to increase protein digestibility by at least one per cent and protein intake by at least five per cent. This means a total reduction of nitrogen excretion to the aquatic environment of at least nine per cent. They say that improved protein digestibility of one per cent may help the industry save DKK50m a year in raw materials.

The project aims to optimize the specific part of feed production known as the extrusion process. During this process the feed is heated and mechanically processed under high pressure - as a total mass - through an extruder, in order to achieve a final product with a specific homogenous form, which is suited for the specific fish and easy to handle. The process involves heat and pressure, both of which may destroy the quality and digestibility of the protein. There is, however, limited knowledge about what happens to the protein during the extrusion process.

"The extruder is like a 'black box' as we only have limited knowledge on the chemical reactions and physical processes that take place in it", associate professor Trine Kastrup Dalsgaard, Department of Food Science at Aarhus University, explains.

The scientists at Department of Food Science are, together with co-workers, currently mapping the effects of extrusion on the physical and chemical properties of fish feed protein sources and examining how these changes affect fish growth, metabolism, protein intake, and nitrogen excretion.

Click here to read the full article.

The Center for Tropical and Subtropical Aquaculture (CTSA) is one of five regional aquaculture centers in the United States established and funded by the U.S. Department of Agriculture's National Institute of Food and Agriculture (NIFA) under active grants 2010-38500-20948, 2012-38500-19566, and 2014-38500-22241. The regional aquaculture centers integrate individual and institutional expertise and resources in support of commercial aquaculture development. CTSA was established in 1986 and is jointly administered by the Oceanic Institute and the University of Hawaii.

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