



He'eia Fishpond: An expanded role for traditional aquaculture in climate adaptation

I ka wā ma mua ka wā ma hope (The future is found in the past)



photo: Manuel Mejia, Island Air article

Fishponds were a culturally significant feature in the ancient Hawaiian landscape. Aquaculture was practiced all over the Pacific, but it reached its most sophisticated form here in Hawai'i. At one time, more than 400 fishponds were found in Hawai'i but now there are very few in operation.

“The fishpond is a place of traditional Hawaiian aquaculture. It’s a place that sustained our people for generations,” explained Keli'i Kotubetey, Assistant Executive Director of Paepae o He'eia.

He'eia Fishpond, likely built 600-800 years ago, encloses 88 acres of brackish water on the Windward Coast of O'ahu. Culturally significant, this *loko i'a* (fishpond) lies on Kamehameha Schools lands, nestled among the mountains, *lo'i* (irrigated terraces) and native forestry programs. The pond is fed by a stream, which is currently choked by invasive mangroves. While the fishpond is not fully operational in terms of aquaculture, it is a huge source of cultural knowledge and prime learning laboratory for practitioners and scientists alike. The *loko i'a* is being restored to its former glory and utility by Paepae o He'eia, an organization that works to remove mangroves, rebuild the walls, and educate thousands of visitors each year.

While sea level rise (SLR) is not on the organization's immediate planning horizon, Paepae o He'eia is one of the partners in the NOAA Hawaiian Islands Sentinel Site Cooperative. This larger effort coordinates “climate change planning and preparedness to promote coastal and community resilience.”¹ The *loko i'a* was damaged in 1965, when a huge flood broke the fishpond's walls. Even today, waves during extreme high tides will wash over the walls causing minor damage. With SLR, this damage will only increase. The walls are not being built higher,

¹ NOAA Hawaiian Islands Sentinel Site Cooperative flyer.



though, for a couple of reasons, according to Kotubetey. First, given limited funds, SLR is not a priority yet. Second, reconstruction goals are to rehabilitate the entire structure to historical accuracy. Once this is done, Paepae o He'eia will look ahead to plan for SLR and other climate events. For now, the main focus is to make this a functional fishpond.

“We don’t have a fishpond if the ocean inundates the walls,” said Kotubetey. “So that’s something that we really have to address because already, in the last 5 to 10 years, we’ve seen the restoration work that we’ve done already begin to erode. So we’ve got to build the walls higher.”

Loko i'a could prove to be effective tools in addressing SLR and coastal resiliency. Depending on their structure, their walls could act as a barrier protecting inland infrastructure from wave inundation or flooding. It is important to incorporate fishpond planning into SLR adaptation efforts to allow traditional aquaculture to flourish throughout the state. As agricultural lands shrink because of SLR, fishponds, if effectively organized, may be one of the keys to providing food security in the Hawaiian Islands.

Going forward, the state can assist in various ways to encourage the establishment and smooth running of these unique traditional farming features in Hawai'i.

RECOMMENDATIONS FOR THE FUTURE

1. To withstand SLR and storm events, effective design and sturdy construction will be needed. Funding this effort will be a major issue and broader state support will be necessary, such as streamlining the entire process from permitting to construction. Current permitting processes only include restoration activities and very minor expansions beyond original construction.
2. Practitioners have consistently expressed an interest in support of a fish hatchery to provide a stable base for production, according to Brenda Asuncion, who manages a statewide network of fishpond stewardship organizations through Kua'āina Ulu 'Auamo (KUA), a cultural and environmental conservation initiative.
3. Consistent support is necessary for the network to share *'ike* (knowledge) about reconstruction of *loko i'a*, removal of invasive species, fish stocking and take levels, pricing, and other relevant topics.