Adapting Aquaponics for the Pacific Islands

American Samoa

Kiara Sakamoto and Harry Ako
Molecular Biosciences and Bioengineering Department
College of Tropical Agriculture and Human Resources
University of Hāwaiʻi at Mānoa
Center For Tropical and Subtropical Aquaculture

Photo by Kiara Sakamoto
Our approach to extension

- Face to face, long term extension
- Problems are solved quickly and easily by both on-site extension agent and farmer
- Networking

“I hear and I forget. I see and I remember. I do and I understand.”
- Confucius
Identifying the Need

- There is little food security
  - All fruits and vegetables are imported from New Zealand
- Land is a premium
  - Very expensive to buy; most land is held by families
- Growing population

- These are Samoan priorities
What is Aquaponics?

- Growing fish and plants symbiotically in one system
  - Fish metabolites feed plants and plants purify fish water
- 6x more production per unit area than traditional agriculture
- Now using modern materials and technology to improve upon ancient methods

Ako and Baker, 2009; Photo by Larry Hirata
CTAHR/CTSA Aquaponics Method

- Plant needs were assessed using hydroponics solutions
- Low capital and maintenance costs
- Potassium and iron are controlled
- Shows that water chemistry is paramount to a successful system
- Heavy extension work
- Without the good science and extension, it wouldn’t work

Ako and Baker, 2009
Goals of the Project

• Build two working systems
• Face to face long term extension work with farmers
• Teach people basic operation and economics
• Make sure they thoroughly understand the chemistry so they can operate logically and efficiently long-term
Building the Systems

• 1 system: 2 trays, 1 tank, 96 plants, 5 kg fish
• 2 sites: ASCC Land Grant, Taputimu village

Photos by Kiara Sakamoto
Daily Management

- Taught farmers how to feed the fish optimally by assessing leftovers
- Taught water quality parameters
- Taught and guided weekly water chemistry testing
- Guided farmers to manage the systems through their own informed decision making

Photo by Kiara Sakamoto
Economics and Marketing

A. Samoa: Lettuce: $3/lb and Tilapia $3/lb

<table>
<thead>
<tr>
<th></th>
<th>12 plywood= raceway</th>
<th>5 raceways (starter farm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annualized capital costs</td>
<td>$332</td>
<td>$2,080</td>
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<tr>
<td>Annualized variable costs</td>
<td>$1,774</td>
<td>$9,045</td>
</tr>
<tr>
<td>Gross income (lettuce/tilapia)</td>
<td>$9,147 ($7,602/$1,545)</td>
<td>$45,738 ($38,016/$7,722)</td>
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<tr>
<td>Net profit</td>
<td>$7,041</td>
<td>$34,613</td>
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A. Samoa average annual income: $8000

Possible Markets
- School Lunch Program
- Cost-U-Less
- Co-op business
- Local Restaurants
  - Mom’s
  - Tradewinds
  - Sadie’s by the Sea
- Small grocers
  - KS Mart
  - US Mart
  - Convenience Stores

Ako and Baker, 2009; Ako and Sakamoto 2011
Getting the Word Out

- Site Visits
  - Duke’s Ponds, Sefulu’s Ponds, Kuki’s Farms etc.

- Media Coverage

- Four Workshops
  - 2 at ASCC Land Grant, 2 held in Taputimu Village

Photos by Francis Leiato and CNR Interns
During Those 6 Weeks...

- Discovered that aquaponics is a viable option for the farmers
- Inspired a third system, funded by Land Grant, and two future grassroots businesses
- Worked hands on with people and taught by having them see, do and practice under guidance

Photo by Larry Hirata
Goals for the Future

- Apela Afoa and Larry Hirata are starting a Hydroponics / Aquaponics Co-op
- Alfred Selinga is starting a future Lettuce and Salad Mix Business
- CTSA’s locally produced Samoa Fish Feed Program is critical
Acknowledgements

- Funding provided by the Center for Tropical and Subtropical Aquaculture
- Special thanks to Apela and Mina Afoa for extending their home and hospitality
- Also to Larry Hirata and ASCC Land Grant CNR for their support in American Samoa
- And to Kamal Singh for generously donating 5 kg of tilapia for this project