

A Case Study of Molokai Agriculture (Part I)

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We've come a long way, the wrong way, from totally self-sufficiency to almost total dependence on imported food. We can look at this as complacency, slothfulness, an addiction or just a lack of vision.

We import 85-90% of our food, and catchy phrases like 'food security' and 'food sustainability' are buzz words that mean nothing and have no teeth as decision makers give lip service to 'increasing food production by 50%' and throwing crumbs to the idea. This is an utter embarrassment to a former nation that was totally self-sufficient over 200 years ago, and a testament to how much energy we've really put into growing our own food since then.

We've become accustomed to someone else far away growing our food, and we've yet to feel the full brunt of this dependence and what can happen if production and transportation lines are severed. It's easy to have a positive attitude that good times will always be here until something really bad and out of our control happens. It's not a matter of if but when this will happen.

Or maybe this is the American way to depend on big business to produce our food. The key word here is 'dependence', but how does this balance with the need to be food secure in the event of a catastrophe?

Food is life in case most of us have forgotten; we can do without a lot of things, but not food, even for a day. So how do we proceed in creating a safe and food-secure Hawaii? It starts with the masses and their perceptions and beliefs in how important this is to our survival. Without this buy-in, nothing moves forward.



Hawaii farmers need more than a few horses, a disk harrow, and an extension agent to succeed, but it's a good start.

How do we get back to the roots of our former agrarian society or do we even want to? There are many benefits such as keeping everyone engaged and out of trouble since we'll all be really busy, from the farmer to the home gardener. It comes down to a basic concept of 'feeding the farmer, so the farmer can feed us.' That sounds pretty simple, but it isn't. It really comes down to priorities in a very complicated society.

There are major changes nationally being imposed on us that may create

opportunities for Hawaii residents, and we may have to fill in gaps and hope that they're long-lived. California, the salad bowl of the U.S., is going through major aches and pains from water shortages to labor shortages, to drought and fires, but they still produce a disproportionate amount of U.S. food and probably will continue even with these struggles, but changes are coming for sure.



We could use a whole lot more lettuce, but will the farmer be able to grow it profitably and compete with imported lettuce? Or should the price be higher for home grown, and will residents embrace this concept?

Mexico is being targeted due to immigration issues, but many don't realize how much food this country grows for us which we couldn't survive without. However, centralizing our food nationally may not be a good idea from the standpoint of food security and food stability and this has played out and will continue to be played out.

The cost of transportation is increasing the cost of food in Hawaii to the point where some products are double that of many metropolitan retail markets in the

U.S. What is the time value when produce gets to Hawaii at least 10 days old or more, and stores face losses of 30-40%? This is creating a rethinking of how we not only sell food but also grow it. Some big players are saying maybe we should be growing it here. So how will these challenges shake out to create pockets of opportunity for Hawaii farmers?

The basic question is "Are we serious about creating a future in Hawaii agriculture?" That's a question few can answer, but actions speak louder than words, and action and lots of it is what we need to take agriculture to the next level or any level for that matter.

If you go about it in a systematic way without politics mucking up everything, it starts with an assessment of what we have and what we don't in order to rebuild a growing food system in Hawaii.

It starts with the human element and the capacity to execute on a business model, since yes, agriculture is a business. We have to make many foundational changes in how we approach agriculture in Hawaii.

After analyzing all of this, the conclusion I come to is this: If you want agriculture to thrive in Hawaii, you would have to **'Focus on the Farmer!** And how would you do that? It starts by improving the conditions and the environment in which a farmer has to farm and exist. This means addressing all the pieces of the puzzle we call agriculture development.

It's lonely out there and how do we get more involved in creating not just farms but also farming communities?



A farm community is composed of farm families. Tall Erythrina (background) was an important windbreak prior to the 1990's until the accidental introduction of the Erythrina Gall Wasp decimated the crop.

Starting with basic economics, the Law of the Minimum prevails. What is the most important resource that's limiting agriculture development and expansion in Hawaii. Land? Water? Markets? Farmers? Investment? Competitive advantages? Labor? Will of the people? Political will? All of the above?

This has been long debated and definitely a chicken-and-egg-issue. What comes first? I would say the farmer and where does the farmer come from? High school? A family farm? The university? Off the street? Southeast Asia? The Midwest, or maybe next door?

How does one become a farmer? By watching You Tube? Pod casts? Working on a farm? Attending a beginning farmer course? Graduating from the College of Tropical Agriculture and Human Resources in Agriculture or

Horticulture? Or waking up one morning and saying, "I want to be a farmer!"

This is a fleeting question that needs to be answered. Many will say that we don't have enough farmers out there, but I would counter that we have farmers out there but they don't have opportunities to prove themselves and have made it very difficult for anyone to get into farming as a profession, even part-time.

Prior to the 1970's and 80's, there were over a dozen pineapple and sugar plantation communities in Hawaii controlled by large corporations such as Castle & Cooke, Dole, Del Monte, C. Brewer, American Factors, Hamakua Sugar, and many others.

Starting in the early 1800's, they changed the landscape and shaped the socio-economics of Hawaii, clearing large tracts of land and developed veins of water systems, rerouting water from deep valleys to large swaths of land to irrigate King Sugar.

Today, few plantation-type farms remain and their closures have created chaos and upheaval in the local economy over several decades now, displacing families and whole communities as former plantation workers frantically sought new jobs to provide family economic security.

Families moved to where there were jobs, many leaving the islands and communities in which they were born and raised. We replaced it with an

economy totally different from agriculture, and some say we can never return to where we were before.

Today, we continue to grasp at ways to resurrect a new agriculture in the form of diversified agriculture; identifying new crops, seeking new markets, and creating competitive advantages in the process.

Farmers need to find land to farm with reasonable rent, decent land tenure, affordable water, and markets, and access to capital prices. Market prices are based on 'California plus freight' with limited high end markets. This situation forces innovative farmers to seek a balance between focusing on production and marketing.

If we put just half the energy in agriculture that we put into tourism development, we would have a diversified economy with agriculture as an important engine instead of one based on military, government, tourism, and selling land. Feeding the monster is the main focus in Hawaii; build more so you can employ many, break it down so you can build out and up again.

The development of real agricultural communities offers a clear alternative to the fake agriculture dominating Hawaii's rural landscapes that offer no positive impacts to agriculture, and are in fact counterproductive to agriculture by increasing the cost of agricultural land and competing for precious water.



Is this a farm? Kaysville, Utah

Some like to call their community 'agricultural' but the dominant activity is buying and selling land, building houses, flipping it fast, and not producing crops. Agricultural subdivisions are not agricultural communities since producing agricultural products is not the dominant economic activity.

The whole concept behind agricultural zoning is to give farmers a tax break in exchange for jobs, products, and tax revenues created, and in the process create a multiplier effect exceeding most other economic sectors.

You can't just plop farmers in the middle of nowhere, tell them to farm, and expect them to be successful. You have to provide farmers with a whole production and infrastructure system to make them successful, a giant safety net to catch them when they fall if agriculture is really important. It's difficult when you're farming isolated from others with like minds and similar goals, and not linked to the rest of the island or other islands for that matter.

For the most part, we only have pockets of agriculture left in Hawaii.

How do you go about creating a new agriculture out of vestiges of a plantation economy? First, without water you will depend on rainfall which has gotten more unreliable over the last decade and is close to impossible in many areas of Hawaii, so seeking control of water systems is important. Rebuilding old plantation water systems with the goal of creating more food is a critical step.

Identifying competitive advantages, and strengths and weaknesses of your agricultural community is important. This is part of a comprehensive agricultural plan. Some agricultural communities need to be created from scratch.

You need a critical mass of farmers and worker bees, and it can be created in steps as you join forces in some form with others who face similar challenges and decide to work together for the common good, building from there. Sounds like socialism, but pure capitalism isn't working and doesn't 'malama' the people.

The window of opportunity is closing fast as large tracts of the last plantation lands are being swallowed up first for temporary agriculture to keep taxes down, then paving over farms with urban communities such as Ho'opili when the market prices are right, and it will always be right in Hawaii where land is finite. But maybe things can still turn around with recent purchases of large tracts of land in Hawaii?!?!

An area of Cooperative Extension Service work that's not well understood or implemented in Hawaii to any large extent, yet critical to the success of agriculture is Community Resource and Economic Development. This education program is more in line with Peace Corp initiatives such building bridges and roads to create communities than present extension educational programs focusing on the farmer and the farm.

This program focuses on the macroeconomics of agriculture or agriculture infrastructure outside the farm that can increase the farmer's potential for success by decreasing risks and the costs of farming, making things more efficient, and creating new opportunities for diversification to decrease volatility and unpredictability when growing just one crop. These infrastructures are things farmers cannot create on their own, but all can benefit from it.



Agricultural infrastructure in the Molokai Agriculture Park. Two of these facilities, Molokai Livestock Cooperative and Molokai Cooling Cooperative were constructed as part of the Extension Community Resource and Economic Development Program.

Critical to the success and expansion of agriculture is developing infrastructure that can cut the cost of production, from

planting to delivery to markets. This includes improving interisland transportation cost and frequency, upgrading agricultural water systems, creating support services such as supply cooperatives, and post-harvest and value-added processing facilities, as well as providing incentives favoring agriculture such as tax incentives and common fare or subsidies to cover transportation costs.

Subsidies are a bad word, so let's just call it investment, an investment in local food and food security to create fresh, healthy food and everything that comes with it, such as healthy residents. Measuring all benefits will help to justify its investment.

The purpose of the Community Resource and Economic Development Program is to create competitive advantages for farmers and to encourage the expansion of agriculture as an economic engine. Any infrastructure deemed critical to agriculture can fall into this area.

This is the story of extension work conducted on Molokai starting in the early 1980's to create a new agriculture after the closure of two pineapple plantations covering 18,000 acres on the western half of the island and impacting over 60% of the labor force on the island.

Pineapple plantation closures, first with Libby McNeil and Libby in 1975 followed by Del Monte in 1982 brought the island to its knees as residents struggled to

hold their families together and make ends meet. Some relocated to other islands seeking new job opportunities while others stayed behind hoping for better times.

Pineapple companies packed their bags and moved to countries such as Costa Rica and the Philippines which offered them better competitive advantages: cheaper labor to exploit with no union interference, lax environmental laws, supportive countries with favorable taxes, and a better return on investment. The pineapple infrastructure was dismantled and even the crane at Kaunakakai Wharf was shipped elsewhere.



Pineapple Production on Molokai. Hawaiian Home Lands, Hoolehua, Molokai. Undated; before 1976.

All the pineapple production technology discovered and/or created over a period of 100 years was taken with them. The community economic centers created by the plantations, including doctors and dentists office, stores, restaurants, and gas stations, had to be retrofitted to a new era. Two of the communities included Kualapu'u in central Molokai and Maunaloa on west Molokai. The

plantations also owned the homes of workers, and were later sold, some to former employees who still remained on the island.

But from crisis comes opportunity. In the early 1980s, with the writing on the wall, County and State Governments came together to address the issue of dislocated workers, and identified needs of this group; job retraining, housing, and creating a mix of employment opportunities. The Molokai Task Force was created and organized in 1982 to address the closure of pineapple production and the loss of the most important economic engine for the island.

This gave farmers a venue to identify and address issues and concerns affecting Molokai agriculture through the Agriculture Subcommittee, one of several communities tasked with identifying alternatives. Other committees addressed economic opportunities in tourism which was looked upon by many as the possible savior for Molokai.

This committee went through an 18-month process of interviewing agencies and organizations connected to Molokai agriculture, and identified areas of concern, bottlenecks, and possible remedies. After exhaustive meetings, the Agriculture Subcommittee identified 36 key issues hindering Molokai agriculture and actions needed to be taken. Richard Hanchett, veteran Hoolehua Hawaiian Home Lands alfalfa farmer chaired the Ag Subcommittee,

and many farmers participated including nursery, corn seed, and both homestead and large farms.

Over 27 issues were identified and voted upon by farmers. The top 5 priorities identified included the following:

1. Alleviate prevailing winds in the farming area.
2. Preserve, maintain, and develop the Molokai Irrigation System for agricultural use.
3. Develop a post-harvest cooling facility for agriculture products on Molokai.
4. Develop a University Cooperative Extension Service demonstration farm on Molokai.
5. Improve harbor and transportation services for agricultural products.



Molokai Irrigation System, presently managed by the State Department of Agriculture, is the lifeblood of the Molokai farming community.

The Agriculture Sub-committee was able to complete their report before all the other committees, which was seen as a tactical advantage, but it was not to be. Their findings were rejected by the Molokai Task Force because of the second priority, “Preserve, maintain, and

develop the Molokai Irrigation System for agricultural use.”

The hidden agenda by both State and County leadership was to increase the transmission of water from a well in central Molokai owned by developers on West Molokai, dubbed Well #17, to the west end through the Molokai Irrigation System, a state-owned agricultural irrigation system for resort development.

Louisiana Land and Oil Exploration Company, developers of West Molokai in the ahupua'a of Kaluakoi, envisioned a community of 40,000 residents. The Sheraton Molokai Hotel and Golf Course employed over 200 residents and was seen as the anchor for the creation a larger resort community.

It seemed sacrilegious to many that an irrigation system built for agricultural development, especially the utilization of Hawaiian Home Lands agricultural lots would be retrofitted for large scale tourism development. There was already much controversy regarding the transmission of water from Well 17 through the Molokai Irrigation System to West Molokai when it was first approved in the mid 1970's by the State Department of Land and Natural Resources.

Controversial and questionable decisions by the State Board of Land and Natural Resources made the issue more heated. Two unions representing hotel workers were also vying to represent these new hotel workers, and one of them also sat on the land board.



Hoolehua Hawaiian Home Lands, a 7,600 acre parcel and the second homestead developed as part of the Hawaiian Homes Act of 1920. Composed of mostly 35-acre agricultural lots awarded to Hawaiian families in the mid- and late-1920's, this entire area was formerly in pineapple production starting in the 1930's.

Hawaiian Homesteaders lost two suits, one before the State Supreme Court blocking the movement of water to West Molokai in the mid-1970's which led to development of the resort and golf course.

The Molokai Task Force's decision to reject the findings of the Agricultural Task Force did little to slow momentum of the farm movement. Farmers were already in the process of forming the Molokai Farm Bureau, and this provided another pathway to address key issues identified in the Agricultural Subcommittee Report by submitting bills to the Hawaii State Legislature to push projects forward.

The conscious and articulated development of agriculture on Molokai after the closure of 18,000 acres of pineapple was a game of chess with two or more players; farmers, government, and private developers, all with slightly different values and goals. Things

happen for a reason and it usually has to do with the need for an economic stimulus or job creation driven by government and rarely by grassroots initiatives.

Government saw a need to create a base of tax payers by stabilizing employment as opposed to absorbing rampant unemployment with many families on public assistance. The businesses main goal was to increase the value of their holdings and make a profit, possibly even expanding, with a ready workforce of residents now without jobs. Farmer's goals included the ability to expand and make a profit with reliability.

Through awareness and activism with strong grass roots, change was possible on Molokai. During the mid-1970's Molokai was a hotbed of activism, leading the Kaho'olawe movement and also Molokai-based initiatives such as Hui Alaloa to open access to coastal areas and ancient trails. Through surveys, the development of agriculture was looked at as a high priority in eyes of the community.

Windbreak Development Program

A comprehensive windbreak program was proposed for most of Hoolehua, especially the Hawaiian Homes areas encompassing 7,600 acres. Funding from USDA Soil Conservation Service (SCS), presently the Natural Resources Conservation Service (NRCS) proposed the planting of windbreaks on each homestead agricultural lot.

However, the Department of Hawaiian Home Lands was unwilling to sign off as the landowner, so the project died. However, on-farm projects moved forward through SCS cost-sharing programs including installation of windbreaks and irrigation systems, and the identification of new windbreak species were also in full swing.



Tall Ironwood [Casuarina equisetifolia](#) windbreaks to protect crops from strong northeast trade winds in Hoolehua Hawaiian Home Lands.

A farmer was experiencing seedling dieback when sowing a new field of alfalfa, and suspected herbicide damage from former pineapple production. To identify the herbicide used, an herbicide bioassay trial was conducted.

This involved planting rows of different plant families including mustards, lettuce, tomato, a grass, and a cucurbit to possibly identify the herbicide in question. None of the plants showed herbicide damage, and it was determined that herbicide damage was not the issue.

An adjacent farmer who visited the test plot asked if the grass had potential as an in-field windbreak. That grass was Sorghum-Sudan hybrid grass. This

started a series of research projects with Extension and USDA Plant Materials Center to create a system to utilize this grass as a windbreak, including seed spacing, seeding rates, water requirements, and fertility program starting with a variety trial.



Sorghum-sudan hybrid grass in-field windbreaks protecting cucumber rows. Jefts Farm, Hoolehua

Before long, there were over 10 miles of this variety utilized as infield windbreaks for watermelon, tomato, peppers, eggplant, and other crops. This technology was shared with farmers on neighbor islands.

The first varieties, such as ‘Haygrazer’ turned into a weed as it dropped seeds throughout the crop fields and became a pest. The next goal was to test varieties that wouldn’t become invasive, and sterile seed varieties were identified. Of these, the best variety was Dekalb ST6+, a sterile seed variety.

After a while, difficulty in securing seed of Dekalb ST6+ required more field trials to identify alternatives. More recent work identified long-day varieties that do not produce seed under Hawaii’s short day conditions, such as Big Kahuna,

Sweeter N Honey, and more recently Bundle King.



Sorghum-Sudan Hybrid grass (right) utilized to minimize wind damage in gardens and farms. Hawaiian Home Lands, Hoolehua.

Field research has continued in the last couple of years by Alton Arakaki to identify varieties with high sugar content as a plow-under crop to increase microbial activity in fields prior to planting.

Molokai Cooling Plant

The development of a cooling facility was one of the priorities, and farmers came together to create the Molokai Cooling Cooperative. State legislative appropriations as well as federal monies from the Economic Development Administration made this project possible.

With the assistance of both Molokai Extension Agents, the cooperative was organized and designed simultaneously with strong farmer participation. The creation of a cooling facility would allow for more diversity in crop production. Prior to this, the focus of agricultural production was on crops that didn’t

require refrigeration such as sweet potato, irish potatoes, tomato, onion, watermelon, and alfalfa, with a few exceptions where farmers developed cooling systems for their crops, including green beans and peppers.



Hoolehua Homestead watermelon farmers Byron and David Bush; a legacy of homestead watermelon growing since the late 1920's.

This project was an ambitious undertaking with a steep learning curve such as identifying what type of cooling system to be utilized and configurations to allow many different crops to be cooled. After visiting cooling facilities in California such as vacuum cooling, hydro-cooling, and forced air cooling, forced-air cooling was selected due to its ability to cool an array of crops.

Due to the high cost of electricity on Molokai, the group looked at generating its own electricity, and potential partners such as Cummins Diesel were interested in setting up a generation facility on the cooling plant site. However, the combination of state and federal funding called for following rules and regulations from both levels of

government and precluded the facility from connecting to any source other than the existing electrical grid.

Another more contingency-focused justification for generating its own electricity was in the event of a catastrophe, this facility could be used to store food on the island, both crops from the field as well produce in stores that lacked back-up generation systems and lie within the tsunami inundation zone, including the entire town of Kaunakakai.

Farmer surveys were conducted to help identify crops that could be produced in order to keep the facility functional. Many looked at this as a chicken-and-egg situation. What came first, the facility or the crops? It couldn't just be a 'build it and they will come' situation.

At that time, Hawaii agriculture was in flux with the closing of sugar and pineapple operations on other islands, including Oahu and it was unclear how this would shake out in terms of competitive advantages for all farmers focusing on the primary market, Honolulu. This created uncertainty in the minds of farmers on all neighbor islands since this change would open the door to Oahu farmers with significant competitive advantages.

The advantage of farming on Oahu is that it allows farmers to deliver on demand which allows them more control and influence of markets there, while neighbor island farmers dealt with additional costs of transportation and

the inability to have a grip on a volatile market. This is what happened. Being bullish in the marketplace is important. In agricultural marketing, either the wholesalers had you 'over the barrel' or you had them 'over the barrel', and there was no middle ground.

Integral to the development of farms in central Oahu after the closure of sugar and pineapple production was access to affordable water to support continued crop production in this arid area. This was at the crux of a major water battle starting with a contested case hearing before the State Commission on Water Resource Management and ending up in the State Supreme Court in the 1990's and beyond.

The issue was whether to continue to allow the transmission of water from an old irrigation water system in Windward Oahu designed for sugar production to the Ewa Plains and adjacent areas. There were hidden agendas to keep the water in the central plains, including the need to recharge the Pearl Harbor aquifer in the interim allowing for continued housing development in this area after farms are pushed out.

The construction of a post-harvest cooling facility alone was not enough to prompt farmers to shift to exporting new crops. There are many factors that influence farmer's decisions on whether to take a quantum leap into the Honolulu market, including reliability of the market, additional infrastructure to make the shift, access to capital, labor needs, return on investment, and other

competitive advantages. There were too many question marks for farmers to answer.

In the end, only one farmer took the leap into the Honolulu market, while he shifted the majority of his farm operation to Honolulu to become the largest diversified farmer there. He also benefitted from the agricultural technology developed on Molokai.



Will organic papaya be the next big crop for Molokai?

In the next installment, the story of the Community Resource and Economic Development Program on Molokai continues.

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Hauoli Makahiki Hou! Trying to play catch-up after taking a six-month sabbatical, the first of 37 years in extension. 'Times they are a changin' as the song goes, and so goes Hawaii agriculture, hopefully for the better. More next time...

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