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January 23, 2018

The Honorable Ronald D. Kouchi,
President and Members of the Senate
Twenty-Ninth State Legislature
Honolulu, Hawai'i 96813

The Honorable Scott Saiki, Speaker
and Members of the House of Representatives
Twenty-Ninth State Legislature
Honolulu, Hawai'i 96813

Dear President Kouchi, Speaker Saiki, and Members of the Legislature:

For your information and consideration, the University of Hawai'i is transmitting one copy of the Report on a Coordinated Framework of Support for Preschool and Post-Secondary Agriculture Education (Senate Resolution 80, 2015) as requested by the Legislature.

In accordance with Section 93-16, Hawai'i Revised Statutes, this report may be viewed electronically at: <http://www.hawaii.edu/offices/government-relations/2018-legislative-reports/>.

Should you have any questions about this report, please do not hesitate to contact Stephanie Kim at 956-4250, or via e-mail at scskim@hawaii.edu.

Sincerely,

David Lassner
President

Enclosure

UNIVERSITY OF HAWAI‘I SYSTEM REPORT



REPORT TO THE 2018 LEGISLATURE

Report on a Coordinated Framework
of Support for Preschool and Post-Secondary
Agriculture Education

Senate Resolution 80 (2015)

January 2018

P-20 Agriculture Education Working Group



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I. Executive Summary

The goal of agricultural education is to reconnect our children, youth, and adults with the ‘āina: that which feeds us mentally, spiritually, and physically.



The Charge

In 2015, Hawai‘i State Senate Resolution No. 80 requested that the UH-Mānoa College of Tropical Agriculture and Human Resources (CTAHR) develop an “implementation strategy and recommendations for the creation of a statewide coordinated framework of support for P–20 agriculture education, including any proposed legislation.”

Progress

To gather input and recommendations to respond to this resolution, CTAHR invited members of stakeholder groups that were currently working in the field of agricultural education to form an Agricultural Education Working Group (**P–20 Ag Ed Working Group**). These groups include the State education system (P–20), in which ag ed-related activities and programs are conducted in HIDOE elementary-level schools (Pre-K–8) and formal courses and programs are offered through the HIDOE secondary-level schools (9–12) and the UH System (13–20). State department leads on agriculture, health, nutrition, labor, and a number of community-based organizations and non-profits are also contributing to P–20 Ag Ed Working Group, which would, through participation in a series of meetings, create a summary of current statewide resources for P–20 ag-ed programs and offer recommendations for furthering the visions of this group and Governor Ige with regards to agriculture education in the state.

This report is a work in progress, reflecting the experience and research of the participants in the group, and may not include all resources available in the Islands.

Vision

The P–20 Ag Ed Working Group envisions thriving agricultural systems in Hawai‘i that are an integral part of our community’s consciousness where public and private entities value and invest in ‘āina-based learning, local food production and consumption, community health and wellness, and diverse agricultural connections and career opportunities.

Recommendations

Based on the P–20 Ag Ed Working Group’s vision, Governor Ige’s vision for doubling food production by 2030, and the findings of the stakeholders participating in the P-20 Ag Ed Working Group, the main recommendation is for **funding in the amount of \$400,000 for a paid coordinator** housed under CTAHR to coordinate the continued work of the P–20 Ag Ed Working Group and to **support the efforts of the P–20 Ag Ed Working Group**.

This working group will 1) engage in discussions with appropriate State departments such as HIDOE, HDOA, DLNR, DBEDT, DOH, and DLIR, 2) continue refining and building on our initial work, so that by Dec. 2017 the P-20 Ag Ed Working Group will develop a coordinated framework that will focus on the group's long-term recommendations:

1. **Teacher Development**

Create a strategy for, and increase investments in, teacher training and preparation.

2. **Curriculum Integration**

Increase efforts for curriculum integration, to build school culture around appreciation and understanding of agriculture across all subject areas.

3. **Human Resources**

Increase staffing resources and collaboration for school capacity-building.

4. **Marketing and Branding**

Market agricultural education and career pathways to students more thoughtfully.

5. **Higher Education Access**

Increase access to a diversity of higher educational options, especially for neighbor islands.

6. **Increase Collaboration**

Lessen redundancy and increase collaboration between organizations.

In order to achieve the above goals, funding for a permanent coordinator for P-20 Ag Ed and for the continued work of the P-20 Ag Ed Working Group is necessary and needed.

Additional Participants

The P-20 Ag Ed Working Group should include regular participation from representatives of the following groups, in addition to the consistent and regular participants, listed on pg. 5 of the report:

- Legislative leads on agriculture and education
- Representatives from Hawai'i Department of Labor and Industrial Relations and from DLIR's Agriculture Workforce Advisory Group
- HI DOE Office of Curriculum, Instruction, and Student Support
- Other UH system and other higher ed representatives
- DOH SNAP-Ed
- Representatives from all interested community non-profit stakeholders

II. The P–20 Ag Ed Working Group



Purpose

The purpose of the P–20 Ag Ed Working Group is to assess the current state of agriculture education in Hawai'i and prioritize needs and next steps toward the creation of a holistic framework of support for P–20 (preschool through post-secondary) agriculture education in the state. The Hawai'i State Senate adopted [Senate Resolution No. 80](#) in the 2015 legislative session, requesting that the UH Mānoa College of Tropical Agriculture and Human Resources (CTAHR) convene such a working group, and that the group develop a plan for implementation by Dec. 31, 2017. A legislative report is due December 30, 2016, outlining an implementation strategy.

Both the Department of Labor & Industrial Relations Report in 2014 and the P–20 Ag Ed Working Group in 2016 have focused their work on discussing issues and possible solutions that will assist the State in creating an agricultural industry that truly helps Hawai'i become self-sustaining. All parties, from industry, education, and government, agree that more must be done to help develop a vibrant and sustainable agriculture industry that is not only attractive for the next generation but also becomes a strong economic pillar in the state. The continued development of and support for agricultural educational programs pre-K–20 will greatly assist in those goals.

Participants

Over the course of seven stakeholder meetings, from August 2015 to December 2016, active P–20 Ag Ed Working Group participants included the following groups:

Agricultural Leadership Foundation	Hawai'i Master Gardener Program
Future Farmers of America	Kamehameha Schools
GoFarm Hawai'i	The Kohala Center (Hawaii Island School Garden Network and FoodCorps Hawaii)
Grow Some Good Maui	Kokua Hawai'i Foundation
Hawai'i Agricultural Foundation	Malama Kaua'i (Kaua'i School Garden Network)
Hawai'i Dept. of Agriculture	MA'O Organic Farms
Hawai'i Dept. of Education	Maui School Garden Network
Hawai'i Dept. of Labor & Industrial Relations	Pacific Resources for Education and Learning (PREL)
Hawai'i Environmental Education Alliance	O'ahu School Garden Network
Hawai'i Farm Bureau	Sust'ainable Moloka'i (Moloka'i School Garden Network)
Hawai'i Farmers Union United	University of Hawai'i CTAHR
Hawai'i Farm to School & School Garden Hui (HUI)	

Progress

The group has thus far accomplished the following:

- Identified and gathered participants from both public and private sectors to coordinate and contribute to policy development for agricultural education;
- Built awareness among stakeholders of work being done by various programs and entities in the area of P–20 agricultural education;
- Built awareness of resources that can be utilized in the area of P–20 agricultural education to allow utilization and reduce redundancies;
- Identified sustainability narrative as an optimal approach towards incorporating agriculture into education;
- Identified strengths, opportunities, and gap areas in P–20 agricultural education;
- Created a map of resources available for P–20 education;
- Identified opportunities for partnerships;
- Created recommendations for future policy support.

Vision

To create a statewide coordinated framework of support for P–20 Agriculture Education, the group drafted the following vision statement:

The P–20 Agriculture Education Working Group envisions thriving agricultural systems in Hawai'i that are an integral part of our community's consciousness where public and private entities value and invest in 'āina-based learning, local food production and consumption, community health and wellness, and diverse agricultural connections and career opportunities.

Thriving, sustainable agriculture systems are elegant and intricate, interdependent, yet robust, resilient and not fragile. These systems that we envision will endure the tests of these times of climate change and geopolitical instability. When built on the enduring principles of nature, this system design we envision will result in dynamic and resilient whole systems that can be used to teach STEAM (Science, Technology, Engineering, Agriculture and Math). P–20 Ag Ed Working Group will articulate a coordinated framework to build agricultural programs with a strong emphasis on sustainable practices and an integration of agriculture education from preschool through workforce, including a strong higher-education sustainable systems component.

P–20 Ag Ed Working Group hopes to create an articulated continuum for the integration of Hawai'i's currently existing programs into a final framework that will be recommended for our agricultural education system for our state. We envision government and the NGO community co-creating farm-to-school programs feeding into FFA and 4-H, feeding into GoFarm-type farmer training programs, feeding into on-farm farmer apprenticeships that will feed agricultural industries and the greater production economy. P–20 Ag Ed Working Group aims to articulate and create this integrated approach to agricultural education, with the ultimate goals of food security and a resilient food-production system for our state. It is recognized that these systems are also a means for the hands-on learning that so many students can learn from and appreciate. P–20 Ag Ed Working Group undertakes this task in the spirit of collaboration with all of those involved, while remaining focused on creating an agricultural workforce that prepares for and mitigates climate change, creates a sustainable and resilient food system, and fosters a new agricultural production-based economy for Hawai'i.

III. Recommendations and Implementation

Funding for a paid coordinator for the P–20 Ag Ed Working Group for two years, funding support for group meetings and for disseminating the findings of the group will allow the group to build the framework and implementation plan for the following recommendations: \$400,000 over 2 years.



Teacher Development

Create a strategy for, and increase investments in, teacher training and preparation.

One of the most commonly requested needs and areas for improvement in Hawai'i's agriculture education was more comprehensive and institutionally supported teacher training and preparation.

The P–20 Ag Ed Working Group has determined that pre-service and in-service teacher training and courses should include the following:

- 1) **Immersive experiences** for teachers in agriculture and farm-to-school programs in which the teachers can experience firsthand where their food comes from and how it is grown;
- 2) Agriculture and farm-to-school **curriculum development** that connects to national and state educational standards;
- 3) Outdoor **classroom management** skills with an emphasis on *safety*; and
- 4) **Nutrition, wellness, and health** integration.

What was once vocational education, with teacher preparation in agriculture, business, home economics, industrial arts education, etc., has transitioned to Career and Technical Education (CTE). There is no formal program in the state that prepares teachers to teach agriculture, nor even any CTE teacher-preparation program. The only available alternative pathways to teacher licensure are the Post-Baccalaureate Certificate in Secondary Education and the Master of Education in Teaching (MEdT) program.

The Department of Education has been in discussion with UH-CTAHR on creating a partnership program whereby CTAHR undergraduates could also be prepared to meet teacher-licensing standards to support further development of agriculture teachers. Continued collaboration and planning in this area could prove to be useful in developing skilled and knowledgeable agricultural educators. Designing and supporting an appropriate teacher-preparation program to support the shared goals of the P–20 Ag Ed Working Group, including paid professional-development days for existing teachers, will be important in implementing comprehensive agriculture professional development and training and would help to education statewide.

Many current teachers have reported a desire to increase their skills and knowledge in agriculture. Investments in professional development would meet their desired learning objectives, as well as increase the agricultural knowledge of educators as a whole.

In the last several years, CTAHR, UH-Hilo's CAFNRM, and Kamehameha Schools have jointly offered for-credit UH summer courses at no or minimal cost to agriculture and science teachers, and in summer 2017, CTAHR and HIDOE are jointly organizing a summer training program at low cost for agriculture teachers, which will help them in the classroom and provide professional development credit so they may advance professionally.

Curriculum Integration

Increase efforts for curriculum integration, to build school culture around appreciation and understanding of agriculture across all subject areas.

Another aspect of increasing teacher training and preparation is providing assistance to teachers in integrating school gardens and agriculture education into the curriculum across subject areas. The group believes this is of critical importance to the health of agriculture education and its related facilities-based resources, such as school gardens and outdoor classrooms. Farm-to-school efforts can and should be integrated academically while meeting national standards through STEM-based learning and connection to all subjects. School gardens and agriculture education offer the ability to connect to real-life learning in a variety of academic subject areas beyond STEM, including history, language, arts, health, physical education, social studies, and Hawaiian studies.

We can achieve this by increasing access to and awareness of available curriculum and by supporting further curriculum development and training. Increased institutional recognition for Hawai'i-based curriculum-development efforts through investments in professional-development training opportunities and paid professional-development days for teachers related to proven localized programs, such as Kokua Hawai'i Foundation's ĀINA In Schools program or The Kohala Center's Ku 'Āina Pa: Hawai'i School Garden Curriculum Map, may provide incentives needed. Teachers interested in this kind of curriculum integration are often not incentivized to participate, yet many use their weekends to attend curriculum training; if training were provided as a part of their work week, we would likely see increased training participation and curricular adoption.

We also recognize the need for streamlining programmatic integration between agriculture education, school gardens, culinary/nutrition education, and school meal programs. Some of the current barriers to deeper integration of these efforts include school meal-procurement policies and food safety considerations. A recent CTAHR collaboration with the Hawai'i Farm to School and School Garden Hui created a publication on basic food safety practices as well as posters to be used on school garden sites. However, work needs to be done in the areas of policy and standardization of school garden food-safety certification efforts.

Additional benefits of widespread curricular integration of school gardens and related agriculture curricula would be the increased health and sustainability of school garden programs, as well as increased student engagement and achievement. The research in Dr. Koh Ming Wei's dissertation, *Discovering Learning, Discovering Self: The Effects of an Interdisciplinary, Standards Based School Garden Curriculum on Elementary Students in Hawai'i* (2012), http://kohalacenter.org/teachertraining/pdf/Discovering_learning_discovering_self.pdf, shows that Kohala Elementary School went from a failing school to a Distinguished School in one year due to collaborative, concerted efforts integrating school learning gardens into the curriculum.

Human Resources

Increase staffing resources and collaboration for school capacity-building.

If increased success in agriculture education is to be achieved, school staff and communities must have their capacity built beyond their current status.

Many advancements have been achieved in Hawai'i's agriculture education due to increased staffing levels through school garden network partnerships with schools; DOE part-time teacher (PTT) funds, ĀINA In Schools docents, FoodCorps, and AmeriCorps VISTA programs have provided supplementary resources to schools across the Islands, which have greatly increased capacity in an extremely affordable way. Researching the potential for larger institutionalized

efforts focused on gardens, environment, and sustainability within these programs on the part of educators, program coordinators, and administrative support staff may be worth exploring further.

Our agricultural communities are an asset to schools, and many community partners are interested in supporting school-based efforts; however, the capacity of schools to capitalize on and direct this support appropriately is limited. Currently, many of these efforts are supported by the island-based school garden networks, which operate on non-profit-sized private funding with limited capability to fully service all schools on each island. County and state-level investments in school garden networks may be a way to further increase school-level support.

Also, increased collaboration between school garden networks, community/parents and school staff, possibly by the Parent-Community Networking Centers (PCNC), would be valuable for increasing collaborations and integrating community partners and support resources within schools. Many school garden partners report that a major challenge in ensuring school garden sustainability lies in garden maintenance, which may be addressed through increased community and parent workdays.

Other collaborative possibilities include utilizing school-based agriculture education facilities as community-based learning centers during non-school hours. This provides an opportunity for shared responsibility for facility investments, maintenance, and operations between schools and community partners. It also provides an opportunity for various complementary programs to engage in community agricultural engagement, such as afterschool and school-break programming, community training classes and workshops, etc.

Marketing and Branding

Market agricultural education and career pathways to students more thoughtfully.

Agriculture is becoming “cool” again; we need to capitalize upon that with peer-to-peer marketing. We suggest changing the narrative given to students concerning agricultural careers: Emphasize sustainability, environmental protection, and health benefits. We note as well that cultural integration is important for meaningful relevancy.

Investment in School-to-Farm Initiatives

Increase investments in internship, apprenticeship, and incubator programs to bridge in-school education with working agriculture experience, especially for high school and college students.

There is a recognized gap in providing in-field, hands-on, professional working farm experience for high school and college-level agriculture students in the form of internships, apprenticeships, and incubator programs. We need to support these *school-to-farm* opportunities so that educated students also have resumes and experiences that help them begin their agricultural careers.

Although the call for new farmers rings loudly from across all islands and from every level of government, there has been little government investment into supporting and expanding these programs. Since this gap was identified in the 2013 Ag Skills Panel Report, much of the new progress in this area has come from GoFarm Hawai'i, Kohala Center, Malama Kaua'i, Hawai'i Farmers Union United, KUPU, and Hawai'i Agricultural Foundation. Increased coordination, investments, and collaborations among island-specific and statewide efforts may help to reduce redundancies and strengthen program capabilities.

Institutionalization of such programs in high schools and colleges, such as Go Farm's base at UH-CTAHR, can help provide long-term stability and integration. Allowing high school students' credit for on-farm internship experiences during school hours, as a part of their Natural Resources Career Pathway option, has the potential to engage more youth in gaining in-field experience. In Waianae, MA'O Farms (http://maoorganicfarms.org/school_programs) is a model school-to-farm program that works very closely with UH West O'ahu's Sustainable Community Food Systems Bachelor's program (<http://www.uhwo.hawaii.edu/academics/degrees-and-certificates/bachelor-of-applied-sciences/food-systems/>) and Leeward Community College's agriculture program (<http://www.leeward.hawaii.edu/pbt>).

A for-credit agricultural internship/apprenticeship class could be offered at University of Hawai'i institutions statewide, perhaps modeled after UH West O'ahu's Sustainable Agricultural Practicum course. If provided as an online course, balanced with in-field internship experience, the course could be available to students at all campuses without the need for multiple coordinators/program leads across the Islands. Incorporation as an allowable elective into all agriculturally related degree programs would ensure availability to agriculture students statewide.

Such programs are critical to allow students to enter the field and gain valuable working experience, build mentor relationships, and gain experience in being farmers, and they align with students' education. Business students don't graduate and immediately become CEOs, just as very few youth go directly from being agriculture students to being farm owners/operators—their early career development *needs* to involve hands-on experience and mentorship by other farmers for them to flourish into budding entrepreneurs themselves. Many farmers and agriculturalists “learn by doing,” so not having paid internships available to students leaves an important piece of their development out of reach. Experience is also a key component to obtaining future loans and land for agricultural purposes.

School-to-farm programs can also provide teachers immersive experiences in agriculture and food production, supporting their work in curriculum integration, career choice promotion, and health and nutrition practices integration.

Higher Education Access

Increase access to a diversity of higher educational options, especially for neighbor islands.

To reach P-20's established goal of 55% of Hawai'i's working-age adults having a 2- or 4-year college degree by 2025, we must increase access to these degrees, especially for neighbor island residents. The University of Hawai'i system currently does not provide bachelor-level educational options on Kaua'i, Moloka'i, or Lana'i, and none of UH's currently available [distance learning options](#) are related to food or agriculture. Work should be done to increase distance opportunities and to articulate community college training with available bachelor's degrees at UH Hilo and UH Mānoa. The UH system-wide Agribusiness Education, Training and Incubation (AETI) Program, a consortium of eight UH campuses and the Agribusiness Incubator Program, funded in large part by a USDA/NIFA competitive grant, has begun sharing resources across campuses (e.g., see pollinator virtual field trip created under the AETI Program <http://cms.ctahr.hawaii.edu/beesmart/Home.aspx> for use at multiple campuses).

The development of online degrees in agriculture and food systems, combined with in-field practice to connect with hands-on learning, would open up opportunities for those seeking advanced education in the field. Online degree options for the related fields of natural resource management, forestry, and conservation are also needed on neighbor islands, in order to accommodate significant workforce demands.

Increased Collaboration

Lessen redundancy and increase collaboration between organizations.

Throughout our research, we recognized redundancy in various program offerings, curricula, and projects. While statewide initiatives typically offer scale, consistency, and increased access to funding, localized community-based efforts are often tailored to meet the more deeply understood target community needs. Local organizations also have “on-the-ground” time and networked connections with target audiences.

We recommend that groups continue their cross-organizational dialogue and increase collaboration opportunities to intertwine programs so that streamlined programmatic frameworks can be created; that funding be committed to the P-20 Ag Ed Working Group to continue the work and to develop the framework; and that explicit collaboration be initiated between the DLIR Agricultural Workforce group and P-20 Agriculture Education group.

The Agribusiness Education, Training and Incubation (AETI) Program is an example of an effort that integrates education and training across the entire UH system.

CTAHR's 22 stations across the state provide a recourse to build a p-20 ag-ed framework that offer a communities and climates a

Implementation Timeline

July 2017 - Funding awarded

Sept 2017 - Coordinator hired

December 2017 - Implementation framework and plan developed

Dec. 2018 – A community model of a P–20 ag-ed program elucidated

IV. Current P–20 Ag Ed Resources

Following is a collection of programs and resources related to agriculture education across the Islands, organized by the grade level/age group served.



Preschool (Early Childhood Education)

Farm to Keiki

Farm to Keiki provides early childcare educators with the tools needed to integrate gardening and nutrition education into their curriculum throughout the entire school year. The program influences lifelong healthy habits and increases the availability of local fresh fruits and vegetables in school meals and snacks by introducing local food purchasing, gardening and nutrition curriculum, school gardens and farm field trips, parent and caregiver workshops, and a wellness policy into the school environment. <https://farmtokeiki.wordpress.com>

K–12

4-H (CTAHR)

4-H is a youth development program for youth ages 5–19. Youth are reached through a variety of delivery methods including community 4-H clubs, short-term/special-interest groups, and military 4-H clubs. Popular 4-H projects are food and nutrition, livestock, clothing, health, safety, environment, and leadership. Science, Technology, Engineering, and Math (STEM) is also guiding new project-development focus in the Hawai'i 4-H Program. <https://www.ctahr.hawaii.edu/4h>

Food Identification Program (Kamehameha Schools, Maui)

In the food identification program, each grade selects a different plant every year, and students learn how to grow, harvest, and process (e.g., cook) that plant by the end of the year. By the time students are seniors, they should know how to grow and use 13 food crops.

Grow Some Good

www.growsomegood.org

Hawai'i Agricultural Foundation (HAF)

HAF's goal is to build an educational continuum from K–12.

Veggie U, piloted in 2013 in HI, is 5-unit, 25-lesson curriculum for 4th-graders to grow their own vegetables in their classroom. It is taught in 157 classes participating statewide. The curriculum encompasses math, science, reading, and social studies. HAF pays for a professional development day for teachers so they can learn the curriculum, and gives them all the kits and tools needed for the lessons. An end-of-year review is required. Veggie U is aligned with General Learner Outcomes, Common Core, HI Content and Performance standards and Next Generation Science standards.

<http://hawaiiagfoundation.org/education/veggie-u>

Aquapono curriculum teaches middle and high school science through aquaponics. The In the Fields high school curriculum program provides paid internships for leading students hand-selected by their agriculture teachers in which students visit a variety of farms, including biotech, traditional, and organic. Kids Cooking Local is a partnership with After-School All-Stars Hawai'i, a program sponsored by Hawaiian Electric Industries and Hawaii Medical Service Association. HAF conducts one hands-on lesson related to healthy eating and home gardens once a month. A chef prepares a healthy dish using ingredients from a Community-Supported Agriculture Local Inside bag once a month. HAF is also working on developing a 2nd-grade curriculum and other new programs. www.hawaiiagfoundation.org

Hawaii Environmental Education Alliance

This group now has a new education director and is becoming more active. The P-20 Ag Ed Working Group plans to discuss plans and resources with the Alliance.

Hawai'i Farm to School and School Garden Hui (The HUI)

The Hui is a coordinated collaborative leading many statewide initiatives in agricultural education and the farm-to-school movement. The group includes island-based networks (Hawai'i Island, Maui, Lanai, Molokai, O'ahu, Kaua'i), as well as representatives from Hawai'i Department of Health, DOE Hawai'i Child Nutrition Program, DOE School Food Services Branch, Department of Agriculture, University of Hawai'i at Mānoa Extension, 4-H and Master Gardener Programs, Kamehameha Schools, the Charter School Network, and community organizations with an agricultural focus. The Hui is based out of The Kohala Center and meets quarterly for strategic planning, program sharing, and policy development.

The group focuses on the three elements of farm-to-school: education, procurement (buying), and school gardens. Hawaii Physical Activity and Nutrition Plan 2013–2020, provides support for school gardens and agricultural education programs and recommends establishing Farm to School Coordinators in DOE and DOA to support school gardens and agricultural education programs. In the 2015-16 HIDOH Safety and Wellness Survey, it was identified that 208 of 256 schools in DOE had school). 51% were using gardens for instructional purposes daily with science, health and nutrition education, CTE agricultural classes and language arts were the top 4 areas of use. www.kohalacenter.org/schoolgardenhui

The Kohala Center

Supports a variety of ag-ed initiatives across grade and experience levels:

Hawai'i Island School Garden Network: Founded in 2008 and administered through The Kohala Center's agricultural education programs, HISGN supports 63 school learning gardens with funding opportunities, resource and volunteer development, ongoing research and report sharing, media and communications, school garden curriculum and nutrition education, and professional development opportunities for teachers K-12 with PDE3 credit. They have hosted 165 professional development events and workshops for teachers and community and 7 statewide school garden conferences. They provided start up grants for school gardens from 2008–2015. HISGN also supports the Charter School Food Working Group, helping 8 charter schools collaborate efficiently to build and maintain school food service programs. www.kohalacenter.org/hisgn

The Ku 'Āina Pa school garden teacher-training program offers professional development for teachers and curriculum resources through the Hawai'i School Garden Curriculum Map, which connects the Common Core subject areas and standards of Math and ELA, Next Generation Science (NGSS), STEM, and Health with garden-based learning in the outdoor classroom in grades K–8. Three cohorts of teachers have completed a year-long training program, earning 6 PDE3 credits from 2012 through 2014. The Curriculum Map was developed with a team of 15 public school teachers in 2014–2015, and

the curriculum is available to download on HISGN website. <http://www.kohalacenter.org/hisgn/curriculum-map> and www.kohalacenter.org/kuainapa

FoodCorps Hawai'i is a national and state AmeriCorps school garden and nutrition program that partners with public and charter schools statewide and places young leaders as full-time garden and nutrition educators in high-need schools. FoodCorps service members focus on hands-on lessons, support the development of healthy school meals, and help lead school wellness committees and promote a school-wide culture of health. In the 2016–2017 school year, 9 FoodCorps Hawai'i Service Members will serve in 14 schools on O'ahu and Hawai'i Island. www.kohalacenter.org/foodcorps and www.foodcorps.org

Hawai'i Public Seed Initiative works statewide to help create ongoing educational opportunities for farmers and gardeners and is currently building the Hawai'i Seed Growers Network, an online portal to purchase locally grown seed for home production and market farms. www.kohalacenter.org/hpsi

Hawai'i Farm to School and School Garden Hui is a statewide group of agriculture education leaders that includes Island School Garden Networks, state agencies, institutions, and organizations that meet quarterly to collaborate on the creation of a coordinated framework of support for agricultural education, increased local food purchasing for institutional food service, and ongoing collection of farm-to-school metrics statewide. <http://kohalacenter.org/hisgn/farm-to-school>

The HI-MEET Program (HI Meaningful Environmental Education for Teachers) helps teachers develop appropriate and engaging classroom curriculum.

The Ke Ku'u 'Āina Program is an after-school and school intersession/summer STEAM educational program for middle school students. <http://kohalacenter.org/hisgn>

Kaua'i School Garden Network / Youth & Food Programs (Malama Kaua'i)

KSGN has 3 full time AmeriCorps VISTAs, each dedicated to a school complex area, to assist with capacity-building services such as new project development, grant writing, fundraising, in-kind donation attainment, volunteer recruitment, and more for school garden, food and natural resources programs. Developed the *Kaua'i Natural Resources Career Pathway Guide*, which lists speakers, internships, field trip sites, pathway options for careers, employers, and more for teachers and students.

Malama Kaua'i's Youth and Food Programs also include the Hawaiian Charter School Food Program, which aims to develop culturally-relevant farm-to-school meal programs for Hawaiian focused public charter schools; local food procurement modeling pilot coming up with 2 AmeriCorps VISTAs designated at 2 pilot schools. They also incorporate fresh produce deliveries to schools through their Village Harvest gleaning partnership program with Kaua'i Master Gardeners. www.malamakauai.org/mk/youth-food-programs

Kokua Hawai'i Foundation

ĀINA In Schools Curriculum: standards-based, multi-subject, hands-on lessons for grades K–6 covering nutrition, garden, composting. 'ĀINA In Schools farm-to-school initiative, launched in 2006, connects children to their local land, waters, and food to grow a healthier Hawai'i. In addition to encouraging the use of locally grown fruits and vegetables in school meals and snacks, the program includes a K–6 standards-based nutrition, garden, and compost curriculum that empowers children to grow their own food, make informed food decisions, and reduce waste. ĀINA In Schools also promotes field trips to local farms and chef cooking demonstrations in classrooms, as well as waste reduction, garden, and cooking educational opportunities for families and community members. Kōkua Hawai'i Foundation works directly with 19 O'ahu elementary schools that have implemented the 'ĀINA In Schools program and trained 356 educators from 214 schools and educational organizations across the state to implement the 'ĀINA In Schools garden, composting, and nutrition curricula.

Maui School Garden Network

Run by in partnership by Kokua Foundation and Grow Some Good, Maui SGN serves over 40 schools by providing training, tech support, resources, and more. Their mission is to develop kids' kuleana towards food security, understanding of nutrition through school gardens, promoting connection between local food producers and schools for all schools. www.mauischoolgardennetwork.org

Molokai School Garden Network (Sust'āinable Moloka'i)

Molokai SGN 2 FoodCorps members for past 2 years in 3 of Moloka'i's 4 elementary schools and 1 middle and high school. They support existing programs and fill in the gaps, working with teachers, cafeteria managers, and performing administrative tasks. They also building an afterschool program focused on agricultural education, farming, aggregation, marketing, and more to students at Moloka'i middle and high schools. Sust'āinable Moloka'i also works in the area of school food procurement, creating a food hub to bring local farmers products into school Fresh Fruit & Vegetable Program (FFVP). www.sustainablemolokai.org

O'ahu School Garden Network

Launched in 2006, OSGN works with 16 O'ahu elementary schools. Core members include Kokua Hawai'i Foundation, HI Association of Independent Schools, and PREL, but open to O'ahu-based individuals and organizations with focus on advancing F2S opportunities. <http://oahufarmtoschool.org/directory.html>

High School

Hawai'i Department of Education

Hawai'i Department of Education offers agriculture education (Natural Resources Career Pathway) programs in 25 high schools statewide. In school year 2015–2016 there were 2,887 students enrolled in agriculture-related courses.

Future Farmers of America (FFA) is an integral part of a quality agriculture education program. Established in Hawai'i in 1930, FFA is one of the oldest agricultural education resources in the Islands. Hawai'i currently has 15 active chapters with over 150 FFA members. Hawaii FFA members participate in a variety of different career development events, including parliamentary procedure, agriculture demonstration, creed recitation, job interview, plant identification, vegetable judging, corsage making, chapter records, extemporaneous public speaking, and prepared public speaking. They also participate in leadership conferences and district and state tournaments. <http://hawaiiffa.weebly.com>

SAE (Supervised Agriculture Experience) is part of the FFA experience. Every student member has an opportunity to participate in implementing an SAE project. FFA members earn income based on their individualized SAE project and work toward chapter, state, and American FFA degrees offered by the National FFA Organization.

Hawai'i Agricultural Foundation

In the Fields Internship Program educates students on conventional, organic, and biotech farming while introducing them to the diversity of careers available in agriculture. This program fosters a workforce that is needed to grow and sustain Hawai'i's agricultural industry.

Kaua'i Ag Internship Program (Malama Kaua'i)

Since launching in late 2015, has provided 27 local high school and college agriculture students with 117 weeks of paid agricultural internships across Kaua'i, with their Summer 2016 Session providing approximately \$10,000 in Educational Awards to participants through a partnership with AmeriCorps. During the internship experience, which is offered during school breaks, interns participate in hands-on agriculture projects, engage with various mentors and guest speakers from across the industry, and complete service learning projects at various sites across the island, exposing them to a variety of agricultural career pathways. In addition to receiving a stipend for their participation, students also receive a recommendation letter and internship evaluation for their future career portfolio.

www.malamakauai.org/mk/sustainable-economic-development/kauai-ag-internships

The Kohala Center's Ag Internship Program in partnership with Kamehameha Schools offers agriculture internships for students ages 16–19. One-week internships are offered during the Department of Education's fall and spring intersessions, and two-week Internships are offered twice during the summer in June and July. The program is based at The Kohala Center's farm in Honoka'a, Hawai'i Island. Interns gain hands-on experience in organic farming, visit local farms, and engage in 'āina-based service learning activities. Stipends are awarded to participants upon completion of the internships.

Post-Secondary

UH West O'ahu Sustainable Community Food Systems (SCFS)

- BS of Applied Science in Sustainable Community Food Systems at UHWO
- Highly interdisciplinary, experiential, hands-on learning
- Half-acre garden on campus
- Sustainability and equity focused
- Interdisciplinary and applied STEM education
- Integrates 'Ike Hawai'i
- Civic engagement and responsibility
- Some courses: Environment and Ecology; Survey of SCFS in HI; Agroecology; Politics of Food; Ag, Food and Human Values; Sustainable Agricultural Practicum (student placed on a working farm of their choice); Food Systems Practicum (students work at Center for Food Safety, policy work, etc.); Theory and Practice of Sustainable Ag (hands-on, applied horticulture and soil science)
 - Electives in food sovereignty, nutrition and human well-being, Native planters of old Hawai'i—Traditional agriculture; Natural History of Bees, Beekeeping and Honey Hunting; Indigenous Science and Natural Resource Management; Development and Social Change; Specialty Crops of Pacific Islands; Research Internships in Agroecology
- Many more courses: See UHWO SFCS for more info
- USDA Step Grant 2016-2019
 - 3-year secondary school professional development series
 - Collaboration with Malama Learning Center and DOE scaffolding UHWO BAS-SCFS curriculum to West O'ahu high schools.

UH Mānoa College of Tropical Agriculture and Human Resources (CTAHR)

- Founding college of the University of Hawai'i land-grant system.
- Undergraduate and graduate degree programs that span all aspects of agriculture, food, and natural resource management, including Tropical Plant and Soil Sciences (BS, MS, PhD), Natural Resources and Environmental Management (BS, MS, PhD), Entomology (MS, PhD), Tropical Plant Pathology (MS, PhD), Animal Sciences (BS, MS), Food Science and Human Nutrition (BS), Food Science (MS), Nutritional Sciences (MS), Nutrition (PhD), Biological Engineering (BS, MS), Molecular Biosciences and Biotechnology (BS), Molecular Biosciences and Bioengineering (MS, PhD).
- Approximately 300,000 sq ft of laboratories, offices, and classrooms in seven major buildings on the Mānoa campus.
- Roughly 1,600 acres of off-campus facilities, including 22 research stations and nine extension offices spanning five major islands in the state of Hawai'i.
- Agribusiness, Education, Training and Incubation (AETI) Program, which was established with the goals of (1) developing and strengthening the local agricultural and food production workforce through education and training and (2) expanding local agricultural and food production through more productive agribusinesses. AETI's partnership of

eight UH campuses and UH's Agribusiness Incubator Program provides educational programs that target a variety of degree levels. AETI's educational programs emphasize student experiential learning and student recruitment, retention, and educational equality, with a focus on developing student leadership skills and building capacity among Hawai'i's rural agriculture communities, including a large number of Native Hawaiian and other traditionally underserved minority populations. Project outcomes include a higher number of graduates in agricultural sciences and increased productivity and profitability of Hawaii agribusinesses.

UH Hilo College of Agriculture, Forestry and Natural Resource Management (CAFNRM)

- B.S. in Agriculture; students chose from the following specializations:
 - Animal Science - Livestock Production Track
 - Animal Science - Pre-Veterinary Medicine Track
 - Aquaculture
 - Tropical Horticulture
 - Tropical Plant Science & Agroecology
- Also offers certificates in Energy Science, Forest Resource Management & Conservation, and Plant Tissue Culture.

<https://hilo.hawaii.edu/catalog/college-of-agriculture-forestry-and-natural-resource-management>

Hawai'i Community College

- A.A.S. and certificate in Agriculture
- A.S. and certificate in Tropical Forest Ecosystem and Agroforestry Management.

<http://hawaii.hawaii.edu/agriculture>

Kaua'i Community College

- AAS/AS/AA Degrees in
 - Plant Biology & Tropical Agriculture,
 - Biological Science
 - Physical Science
 - Culinary Arts
 - Hawaiian Studies
- Certificates in
 - Culinary Arts
 - Hawaiian Botany
 - Hawaiian Studies
 - Plant Biology & Tropical Agriculture
 - Sustainability
- CTE in Aquaponics
 - Apiary, Horticulture
 - Food Safety Certification
 - Tree Felling, Chainsaw
 - OSHA
 - PPE
 - Business Skills

University of Hawai'i Maui College – Moloka'i Educational Center and Molokai Farm

- Associate in Applied Science (AAS) Degrees in
 - Horticulture and Landscape Maintenance
 - Sustainable Tropical Crop Management
- Certificates in
 - Agricultural Science
 - GIS in Ecosystem Management
 - Landscape Management
 - Nursery Production
 - Pest Management
 - Sustainable Tropical Crop Production
 - Turf grass Specialist
 - Floriculture Management
 - Nursery Management
 - Horticulture and Landscape Management
 - Sustainable Tropical Crop Management

Workforce

Agribusiness, Education, Training and Incubation (AETI) Program

This program, offered through the University of Hawai'i, was established with the goals of (1) developing and strengthening the local agricultural and food production workforce through education and training and (2) expanding local agricultural and food production through more productive agribusinesses. AETI's partnership of eight UH campuses and UH's Agribusiness Incubator Program provides educational programs that target a variety of degree levels. AETI's educational programs emphasize student experiential learning and student recruitment, retention, and educational equality, with a focus on developing student leadership skills and building capacity among Hawai'i's rural agriculture communities, including a large number of Native Hawaiian and other traditionally underserved minority populations. Project outcomes include a higher number of graduates in agricultural sciences and increased productivity and profitability of Hawaii agribusinesses.

Agribusiness Incubator Program

The University of Hawai'i's Agribusiness Incubator Program (AIP) helps people who produce, use, or promote agriculture in Hawai'i to start, grow, and improve their bottom line. AIP serves all islands with business planning, marketing, financial analysis, and other guidance designed to launch businesses and products, lower costs, and increase sales. The team is located on O'ahu. www.aiphawaii.com

CTAHR's Certified Master Gardener Program

The University of Hawai'i's College of Tropical Agriculture and Human Resources' Certified Master Gardener Program is a volunteer program administered by Cooperative Extension Service (CES). Master Gardeners are trained volunteers who assist the College in its mission to deliver relevant, research-based, environmentally sound horticulture information to the public. Through community outreach and education, MGs strive to promote sustainable gardening practices and environmental stewardship in Hawai'i. Certified Master Gardeners complete training equivalent to a college-level horticulture course, and must volunteer 40 hours per year in the community. School garden and youth education projects are popular service opportunities across the islands. www.ctahr.hawaii.edu/uhtm

GoFarm Hawai'i

GoFarm Hawai'i is the state's leading Beginning Farmer Training Program, offering non-credit certificates and incubator services on the islands of O'ahu, Kaua'i, Big Island/Hawai'i, and Maui. Their mission is to enhance Hawai'i's food security and economy by increasing the number of local agricultural producers by offering those with an interest in agriculture a combination of knowledge, experience, and support designed to assist them in becoming viable production growers, and accomplish this in a manner that encourages sustainability. They have graduated over 175 students.

Emphasis is on the practical skills and knowledge necessary to become a successful agricultural entrepreneur, thus the curriculum will cover the fundamentals of farm production and business management, and expose participants to the realities of farming through the experience of seasoned farmers. Services such as shared equipment, land, marketing, and business consulting (including pursuit of financing and land matchmaking) will be provided to facilitate participants' entry into commercial farming. www.gofarmhawaii.org

Hawai'i Agricultural Leadership Foundation

The Hawaii Agricultural Leadership Foundation previously received a City and County Grant in Aid which allowed nine (9) FFA students and two (2) teacher/advisors from O'ahu high schools to attend the FFA National Leadership Conference in Washington, D.C. Additionally, the students had an opportunity to interact with the adult participants of the Foundation's Agricultural Leadership Program sharing their career interests and leadership skills. Upon return from the national conference, the FFA student presented highlights of their trip to the Foundation's Board Members. The Foundation continues to pursue funding opportunities to support FFA students including providing scholarships and travel expenses for neighbor island FFA students to attend the Hawaii Agriculture Conference and present their projects.

Hawai'i Farmers Union United

HFUU asserts that a multitude of smallholder diversified family farms that implement regenerative techniques in growing and raising our food will create a resilient, vital and productive agricultural system to better feed Hawai'i's people. Their priorities include supporting family agriculture, demonstrating the relation of climate change to food production, building the agricultural workforce for purposes of sustainable and resilient food stability, developing policies that promote sustainable management of soils, and supporting development projects that facilitate the dissemination and implementation of sustainable ag practices.

They have active chapters on Maui, O'ahu, Hawai'i, and Kaua'i; host an annual conference/state convention; and run a Farm Apprentice Mentorship (FAM) Program on The FAM Program is a year-long apprenticeship and certificate program that teaches regeneration of soil health, farm operation and business planning, as well as provides access to farm and agricultural facilities. It includes 120 hours of experiential classes, 200 hours of applied methods conveyed through mentor-driven on-farm activities, and immersion in HFUU farm projects. Approximately 70% of their graduates are currently employed on farms. FAM currently collaborates UH-Maui College, Sustainable Living Institute of Maui (SLIM) and agriculture department credit program; Maui economic opportunity (MEO) business planning; The Kohala Center for cooperative business development; Hawai'i Department of Agriculture and the county of Maui Office of Economic Development and is planning future community collaborations with GoFarm Hawai'i and Kamehameha Schools 'Āina Engagement program. <https://hfuuhi.org>

Hawai'i Island Beginning Farmer-Rancher Development Program (Kohala Center)

The program has recruited, trained, and supported more than 100 new farmers in the Hāmākua region of Hawai'i Island to date. The seven-month course will deliver more than 70 hours of classroom training, hands-on field days, and farm tours over 14 sessions. Led by University of Hawai'i researchers, Extension agents, and other agricultural experts, the course covers a wide range of critical subject areas, such as managing soil health and fertility; crop nutrition; pest management; business planning, and marketing. In addition to the classroom trainings, hands-on field days, and farm tours, The Kohala Center developed a ten-acre demonstration farm in Honoka'a to provide apprenticeship opportunities for individuals seeking hands-on farming experience.

<http://kohalacenter.org/farmertraining>

GoFarm Hawai'i: Farming Certificate and Incubator Program at The Kohala Center's Farm in Honoka'a on Hawai'i Island.

Hawai'i Youth Conservation Corps (KUPU)

Although focused primarily on offering paid AmeriCorps internships within the conservation field, many of their summer or year-long internship programs are at agriculturally focused sites. <http://kupuhawaii.org/hycc/>

USDA Hawai'i Rural and Cooperative Business and Development Services

Based out of The Kohala Center on Hawai'i Island, the program provides one-on-one counseling and training for farmers. Their services include: Cooperative Business Education, Group Facilitation and Organization, Strategic Project Planning, Feasibility Assessment, Business Planning, Market Analysis, Loan/Grant Application Assistance and Capitalization Strategies, Legal Document Assistance, Professional Referrals, Board and Member Trainings, and Conflict Resolution. <http://kohalacenter.org/business>

V. Island-Specific Resource Analysis

Hawai'i Island



Educational Resources & Pathways

Level	Resource	Description
K–12	<p>Mala'ai: The Culinary Garden of Waimea Middle School</p> <p>4-H (CTAHR)</p> <p>Hawai'i Institute of the Pacific (HIP) Agriculture</p> <p>Hawaii Agriculture Foundation</p> <p>The Kohala Center</p>	<p>The Mala'ai Culinary Garden serves all students at the Waimea Middle School and is the demonstration garden for the Ku 'Aina Pa School Garden Teacher Training Program. This unique program centers on growing and sharing nourishing food and connecting land stewardship, culture, and health. A student farmers market, Community Super Kitchen community volunteer program, local chef visits, and community events and workshops are ongoing. www.malaai.org</p> <p>The East Hawai'i 4-H and Hawai'i County 4-H Livestock groups are active, and popular https://www.facebook.com/pages/East-Hawaii-4-H-Hawaii-County-4-H-Livestock/316404270943</p> <p>Youth programs: K–12 field trips and presentations, middle school campouts, afterschool and summer programs. www.hipagriculture.org</p> <p>Aquapono</p> <p>Veggie U</p> <p>2nd Annual We Grow Hawaii Conference, April 30, 2017</p> <p>Hawai'i Island School Garden Network</p> <p>The Ku 'Aina Pa School Garden Teacher Training Program and the Hawai'i School Garden Curriculum Map</p> <p>FoodCorps Hawai'i</p> <p>Hawai'i Public Seed Initiative</p> <p>Hawai'i Farm to School and School Garden Hui</p>
High School	<p>HIDOE</p> <p>The Kohala Center in partnership with Kamehameha Schools</p> <p>Hawai'i Agriculture Foundation</p> <p>Kahua Pa'a Mua Program</p>	<p>FFA and SAE programs</p> <p>Agriculture Internships (16–19 yr.) One week Internships offered during the Department of Education's fall and spring intersessions, and two week Internships offered twice during the summer (June and July). Program based at The Kohala Center's farm in Honoka'a, Hawai'i Island. Interns gain hands-on experience in organic farming, visit local farms, and engage in 'aina-based service learning activities. Stipends awarded upon completion.</p> <p>Aquapono</p> <p>Ka Hana No'eau is a youth mentoring program that melds traditional knowledge with contemporary methodologies in agriculture and related areas.</p>

<p>Post-Secondary</p>	<p>University of Hawai'i at Hilo</p> <p>Hawai'i Community College</p> <p>HIP Agriculture</p>	<p>B.S. in Agriculture</p> <p>A.A.S. and certificate in Agriculture A.S. and a certificate in Tropical Forest Ecosystem and Agroforestry Management.</p> <p>Immersion course and Internships. www.hipagriculture.org</p>
<p>Workforce / Professional/ Community</p>	<p>The Kohala Center</p> <p>Professional Associations & Groups</p> <p>University of Hawai'i CTAHR agricultural Extension</p> <p>East Hawai'i Island Master Gardeners</p> <p>West Hawai'i Island Master Gardeners</p> <p>HIP Agriculture</p> <p>One Island</p>	<p>USDA Rural & Cooperative Business Development Center: Services include Cooperative Development, Agriculture Business Development, Microloan Programs, Beginning Farmer-Rancher Development Program, and educational and professional services. www.kohalacenter.org/business</p> <p>GoFarm Hawai'i - Farming Certificate and Incubator Program at The Kohala Center's Farm in Honoka'a on Hawai'i Island.</p> <p>Several active groups with regular meetings and educational opportunities include: Hawaii Tropical Fruit Growers, East Hawaii Cacao Association, Hawaii Farmers Union United, Hawaii Farm Bureau, Macadamia Growers Association, Kona Coffee Farmers Association, Hawaii Coffee Association, The Kohala Center, Hāmākua Farmers Cooperative, and Hawaii Papaya Industry Association.</p> <p>Several agriculture Extension agents provide educational opportunities, answer questions and provide recommendations to commercial growers. http://www.ctahr.hawaii.edu/site/Extprograms.aspx</p> <p>Provides educational opportunities, gives recommendations for home gardeners, and community volunteer experiences. http://www.ctahr.hawaii.edu/uhmg/EastHI/index.asp</p> <p>Provides ongoing educational opportunities and maintains an information hotline for gardeners. http://www.ctahr.hawaii.edu/uhmg/WestHI/index.asp</p> <p>Community Workshops and Classes in agriculture and related areas. www.hipagriculture.org</p> <p>Community Workshops, events, and on-going projects in the areas of developing local food systems, renewable energy and green building, watershed protection, and health and wellness. www.oneisland.org</p>

Strengths

- With strong support from The Kohala Center's Hawai'i Island School Garden Network and FoodCorps Hawai'i, the island's agriculture education and school garden programs are slowly building. In 2007, there were 20 school garden

programs, and in 2016, there are 24 paid garden educator positions (PTT), and 21 teacher-led garden programs and another 20 schools with a school garden but no official program or position.

- The Kohala Center has supported the creation of the Hawai'i School Garden Curriculum Map, a school garden curriculum for grades K–8 that connects classroom core curriculum standards with garden-based learning in the outdoor classroom. Ongoing workshops and summer intensives with PDE3 credit for Hawai'i's teachers are critical to advancing school garden education in Hawai'i.
- The FoodCorps Hawai'i Program creates partnerships with DOE high-need schools to provide garden and nutrition education with a full-time educator supported by extensive professional-development opportunities.
- The Kohala Center's USDA Rural Cooperative and Business Development Center offers statewide services for farmers and communities.
- The GoFarm Hawai'i Certificate Program and Incubator will help to build the next generation of Hawai'i's farmers
- There is a High School Agriculture Internship Program for young adults at The Kohala Center's Farm in Honoka'a.
- The Hawai'i Public Seed Initiative strengthens resources for Hawai'i's farmers and gardeners, and for the diverse community of learners. The Hawai'i Seed Growers Network will soon offer an online portal that home producers and market farmers can use to purchase locally grown and adapted seed.
- The Hawai'i Farm to School and School Garden Hui strengthens the ability to work together on a statewide basis to support both farm-to-school initiatives and the agricultural community and help create a coordinated framework of support from government agencies, institutions, private funders, organizations, and individual benefactors.
- The University of Hawai'i at Hilo's CAFNRM has 5 BS degree programs in Agriculture and 11 certificate programs.
- The UH Mānoa CTAHR Master Gardener Program is active both in East and West Hawai'i.
- Six of the eight public high schools have an FFA Program and CTE Natural Resource Pathway.
- 4-H is America's largest youth development organization, empowering young people with the skills to lead for a lifetime and building life skills (like confidence, independence, resilience and compassion) through hands-on learning. Research has shown that young people in 4-H
 - are twice as likely to participate in STEM activities,
 - experience greater educational achievements,
 - have greater motivation and aspirations for future education,
 - are more civically active,
 - are more than four times as likely to give back to their communities,
 - have significantly lower drug, cigarette, and alcohol use,
 - are twice as likely to make healthier choices,
 - report better grades and higher levels of academic competence, and
 - are nearly two times more likely to go to college.

O'ahu



Educational Resources & Pathways

Level	Resource	Description
K-12	Kōkua Hawai'i Foundation	'ĀINA In Schools
	HAF	<p>Veggie U</p> <p>Aquapono</p> <p>Kids Cooking Local: Sponsored by Hawaiian Electric Industries and Hawaii Medical Service Association, and in partnership with After-School All-Stars Hawai'i; HAF conducts a hands-on lesson related to healthy eating and home gardens once a month aimed at middle school students. A chef prepares a healthy dish using ingredients from a Community-Supported Agriculture Local Inside bag once a month.</p>
	4-H	A variety of clubs learning focusing on healthy eating and kitchen skills and environmental concerns.
	HAF	Aquapono

High School	DOE HAF	Natural Resources Career Pathway Programs FFA (Future Farmers of America) SAE (Supervised Agriculture Experience) In the Fields
Post-Secondary	UH Mānoa CTAHR UH West O’ahu	BS, MS, and PhD degrees in all aspects of agriculture, food, and natural resource management BS in Applied Science in Sustainable Community Food Systems
Workforce / Professional	Agribusiness Incubator Program GoFarm Hawai’i Professional Associations & Groups O’ahu Master Gardener Program	Free consulting and business planning services Farming certificate program & incubator Several active groups with regular meetings and educational opportunities Provide educational opportunities, gives recommendations for home gardeners, and community volunteer experiences, http://www.ctahr.hawaii.edu/UHMG/Oahu/index.asp .

Strengths

- A majority of CTAHR’s faculty, staff, and students are based out of UH Mānoa, providing a critical mass of expertise and educational opportunities.
- 4-H is America’s largest youth development organization, empowering young people with the skills to lead for a lifetime and building life skills (like confidence, independence, resilience and compassion) through hands-on learning. Research has shown that young people in 4-H
 - are twice as likely to participate in STEM activities,
 - experience greater educational achievements,
 - have greater motivation and aspirations for future education,
 - are more civically active,
 - are more than four times as likely to give back to their communities,
 - have significantly lower drug, cigarette, and alcohol use,
 - are twice as likely to make healthier choices,
 - report better grades and higher levels of academic competence, and are nearly two times more likely to go to college.

Maui



Educational Resources & Pathways

Level	Resource	Description
K-12	<p>Grow Some Good</p> <p>HAF</p> <p>4-H (CTAHR)</p> <p>Boys & Girls Clubs</p> <p>Maui School Garden Network & Grow Some Good</p>	<p>Maui School Garden Network</p> <p>Veggie U</p> <p>Maui clubs participate in livestock raising and judging, take field trips to farms, and participate in cooking demonstrations.</p> <p>Two out of 7 after school sites have early-phase gardening programs</p> <p>MSGN and GSG work together to manage and network 43 Maui and Lana'i school garden programs. Only 3 schools are presently without any school garden program.</p>
High School	<p>DOE</p> <p>HAF</p>	<p>Natural Resources Career Pathway Programs</p> <p>FFA (Future Farmers of America) Lahainaluna HS Chapter</p> <p>SAE (Supervised Agriculture Experience)</p> <p>Aquapono</p>
Post-Secondary	<p>UHMC</p> <p>GoFarm Hawai'i</p>	<p>AAS/AS/AS degrees in a variety of ag-related fields</p> <p>Farming Certificate Program & Incubator; can be taken for credit at UH Maui College, or as professional development</p>

Workforce / Professional	Hawai'i Farmers Union United	Farm Apprentice Mentorship (FAM) Program
	Professional Associations & Groups	Several active groups with regular meetings and educational opportunities include Hawai'i Farmers Union United, Maui County Farm Bureau, Maui Cattlemen's Association, CTAHR's Master Gardener Program, Maui Landscape Professionals, Tropical Fruit Growers Association, Maui Green and Beautiful
	University of Hawai'i CTAHR Extension	Provide research-based agricultural extension education for Maui county, http://www.ctahr.hawaii.edu/Maui/pages/Programs.aspx
	Maui Master Gardener Program	Provide educational opportunities, gives recommendations for home gardeners, and community volunteer experiences, http://www.ctahr.hawaii.edu/UHMG/Maui/index.asp

Strengths

- Hawai'i Farmers Union United has a strong presence and active Farm Apprentice Mentorship (FAM) Program
- There is increased governmental support for agricultural career/workforce development efforts as well as food-related projects including Maui Food Innovation Center at UHMC and Maui food hub planning organizations.
- All four Maui public high schools have Natural Resources Career Pathways and agricultural classes available for the first time in several years as of the 2016–2017 SY.
- Early-career new farmer development and education has increased with recent additions of GoFarm Hawai'i farmer training program and summer internship programs through the Maui Economic Development Board at the middle school, high school, and college levels through funding from DLIR (Department of Labor and Industrial Resources).
- A natural resources and career pathways guide was developed in 2014 to assess pathways and community resources as an educator and student handbook; being updated in 2016. This guide has provided a common starting part for the development of curriculum for our high school ag programs to support the College and Technical Education (CTE) programs out of the DOE.
- 4-H is America's largest youth development organization, empowering young people with the skills to lead for a lifetime and building life skills (like confidence, independence, resilience and compassion) through hands-on learning. Research has shown that young people in 4-H
 - are twice as likely to participate in STEM activities,
 - experience greater educational achievements,
 - have greater motivation and aspirations for future education,
 - are more civically active,
 - are more than four times as likely to give back to their communities,
 - have significantly lower drug, cigarette, and alcohol use,
 - are twice as likely to make healthier choices,
 - report better grades and higher levels of academic competence, and are nearly two times more likely to go to college.

Recommendations

- One of the greatest needs is to offer a bachelor's degree in Ag Education, which currently does not exist in the State of Hawai'i. Drawing from the mainland to fill this need would not be adequate given Hawai'i's unique tropical and cultural

circumstances. Having a program of this sort would feed into Ag and Natural Resources CTE programs at the high school level and give increasing opportunities for outreach to middle school feeder schools within each DOE complex.

Lana'i



Educational Resources & Pathways

Level	Resource	Description
K–12	4-H (CTAHR)	Afterschool activities clubs
	MEDB	Middle School STEMworks afterschool programs that include agricultural learning
	Hui Malama Learning Ctr.	Culturally focused youth enrichment programs
	Boys & Girls Club	Includes early-phase gardening program
	Maui School Garden Network & Grow Some Good	Lana'i school garden program
High School	DOE	Lana'i High School has a Natural Resources Career Pathway curriculum
	Pūlama Lana'i, MEDB, & Maui County Farm Bureau	Summer internships in ag and natural resources integrated with entrepreneurial skills - Summer 2016 included 16 cohorts from high school and college
Post-Secondary		
Workforce / Professional		

Strengths

- 4-H is America's largest youth development organization, empowering young people with the skills to lead for a lifetime and building life skills (like confidence, independence, resilience and compassion) through hands-on learning. Research has shown that young people in 4-H
 - are twice as likely to participate in STEM activities,
 - experience greater educational achievements,
 - have greater motivation and aspirations for future education,
 - are more civically active,
 - are more than four times as likely to give back to their communities,
 - have significantly lower drug, cigarette, and alcohol use,
 - are twice as likely to make healthier choices,
 - report better grades and higher levels of academic competence, and are nearly two times more likely to go to college.

Moloka'i



Agricultural Education Resources & Pathways

Level	Resource	Description
K-12	Moloka'i High School offer courses in Agriculture Education	Moloka'i FFA chapter is active
	4-H	After-school activities club
	Queen Liliuokalani Children's Center	Various garden and farming activities
	Molokai Youth Center - Molokai Community Service Council	Recreational, educational, and community service activities
	Ka Hikina o Ka La	Support for students in Hawaiian Studies and STEM coursework
	Molokai Live & Uplinks	Afterschool programs that offer academic support and various activities, including Kalo Connection (taro farming and poi pounding cultural program)
	DOE, Molokai High School	Natural Resource and Agriculture CTE coursework with hands-on experiences
	Sust'ainable Moloka'i	Molokai Farm to School and School Garden Program, Kalo Connection after school program

Post-Secondary	University of Hawai'i Maui College - Molokai Educational Center & Molokai Farm KUPU Hawaiian Community Assets (HCA) Sust'āinable Moloka'i	Associate in Applied Science (AAS) degrees and certificates Hawaii Youth Conservation Corps & Conservation Leadership Development Program Youth Financial Literacy & Farm to School Americorps and other community programs Internship & Americorps positions in Farm to School & Financial Literacy (partner with Kupu & HCA)
Workforce/Professional	Professional Associations & Groups Kuha'o Business Center UH-CTAHR Extension Services	MEO-Business Development Center, USDA Ho'olehua Plant Material Center, Natural Resource and Conservation Service, The Kohala Center, Kalaupapa National Historic Park, Molokai Land Trust, The Nature Conservancy, Ka Honua Momona, Molokai Lanai Soil & Water, Hawaii Tropical Fruit Growers, 'Āina Pulapula, Master Food Preservers An advocate and vehicle of empowerment for Moloka'i's families to achieve both individually and collectively financial independence and abundance in the formation of healthy and sustainable businesses. Natural Farming Program, Beginning Farmers Program

Strengths

- Moloka'i has a rich farm-to-school history, including the Molokai High School campus having its own dairy, fruit orchards, and farms, where food was produced specifically for the cafeteria. Although that production dwindled over the past several decades, there has been a recent resurgence in farming education and a push for getting more locally grown food back into our school cafeterias.
- Currently, all four of the island's elementary schools have school gardens and/or related farm-to-school educational opportunities. Locally grown products have made their way to Moloka'i students through Sust'āinable Moloka'i, who has been the vendor for Maunaloa and Kaunakakai's Fresh Fruit & Vegetable Program (a USDA-funded snack program). In addition, Kualapu'u Elementary has begun serving a "Homegrown School Lunch" each quarter.
- Molokai High School has various classes in natural resources and agriculture as part of its Career and Technical Education (CTE). UH Maui College, Molokai Educational Center offers a wide range of agricultural certificates and associate degrees, including numerous classes and hands-on experiences at the UHMC Molokai Farm.
- Moloka'i's University of Hawai'i CTAHR Extension agents offer Beginning Farmer & Natural Farming classes regularly.

- The Sustainable Molokai Food Hub and its newly launched Mobile Market are working to better connect local supply and demand. They recently implemented easy-to-use software that allows residents to order products from local farmers/producers and have it delivered to their neighborhood.
- 4-H is America's largest youth development organization, empowering young people with the skills to lead for a lifetime and building life skills (like confidence, independence, resilience and compassion) through hands-on learning. Research has shown that young people in 4-H
 - are twice as likely to participate in STEM activities,
 - experience greater educational achievements,
 - have greater motivation and aspirations for future education,
 - are more civically active,
 - are more than four times as likely to give back to their communities,
 - have significantly lower drug, cigarette, and alcohol use,
 - are twice as likely to make healthier choices,
 - report better grades and higher levels of academic competence, and are nearly two times more likely to go to college.

Recommendations

- Sustainable Moloka'i is currently working to develop a stronger Moloka'i Farm to School & School Garden Hui.
- Need more full-time local farmers/producers.

Kaua'i



Educational Resources & Pathways

Level	Resource	Description
Preschool	Farm to Keiki	Farm to school support for early childhood caregivers and families
K-12	4-H (CTAHR)	Livestock club
	Kaua'i Community College	Summer camp enrichment programs
	Waipa Foundation	Culturally focused youth enrichment programs (Hanalei)
	Na Pua No'eau	Culturally focused youth enrichment programs
	Boys & Girls Clubs	All three afterschool sites have early-phase gardening programs
	Malama Kaua'i	Kaua'i School Garden Network
	National Tropical Botanical Garden	Hawaiian Charter School Food Program
HAF	Ethnobotanical school field trips and youth programs	
		Veggie U

High School	DOE	All 3 public high schools now have Natural Resources Career Pathways with agriculture classes as of 2016-2017 school year Future Farmers of America (FFA): Kaua'i High chapter (Lihue) and Waimea High chapter are active in SY 2016–2017. Kapa'a chapter is planning to be active in SY 2017–2018.
	Malama Kaua'i	Kaua'i ag internship program
	HAF	Aquapono
Post-Secondary	Kaua'i Community College	AAS/AS/AA Degrees, certificates, and CTE in a variety of ag-related fields
	Malama Kaua'i	Kaua'i Ag Internship Program
Workforce / Professional	GoFarm Hawai'i	Farming Certificate Program
	Professional Associations & Groups	Several active groups with regular meetings and educational opportunities include Hawai'i Farmers Union United, Kaua'i County Farm Bureau, Kaua'i Cattlemen's Association, Kalalea/Anahola Farmers Hui, CTAHR's Kaua'i Master Gardener Program, Kaua'i Landscape Industry Council, Tropical Fruit Growers Association
	KUPU	Youth Conservation Corps & Extended Internship Program (agriculture-focused conservation internships)
	Small Business Development Center	Business planning support
	CTAHR Extension Services	Technical and research assistance Master Food Preservers & Master Gardener Certifications, http://www.ctahr.hawaii.edu/UHMG/Kauai/index.asp

Strengths

- Increased governmental support for agricultural park development in each moku and an emphasis on supporting agricultural career/workforce development efforts; many new professional-level projects have begun or are on their way, including Kaua'i County Food Incubator, Kilauea Agricultural Center, Moloa'a Food Hub, Malama Kaua'i Agricultural Education Center, and IWIKUA.
- In the 2015-2016 school year, 67% of schools had a school garden; out of the 27 schools and afterschool programs, 9 did not have a garden program in some form. Schools have significant interest from the community in supporting their efforts.
- All three Kaua'i public high schools have Natural Resources Career Pathways and agricultural classes available for the first time in several years as of the 2016-2017 SY.
- Early-career new farmer development and education has increased with recent additions of GoFarm Hawai'i farmer training program and Malama Kaua'i's Ag Internship Program.

- [Natural Resources Career Pathway Guide](#) was developed in 2014 to assess pathways and community resources as an educator and student handbook; being updated in 2016. It's proven to be a useful tool for teachers in becoming aware of community based resources to make real-life classroom connections.
- 4-H is America's largest youth development organization, empowering young people with the skills to lead for a lifetime and building life skills (like confidence, independence, resilience and compassion) through hands-on learning. Research has shown that young people in 4-H
 - are twice as likely to participate in STEM activities,
 - experience greater educational achievements,
 - have greater motivation and aspirations for future education,
 - are more civically active,
 - are more than four times as likely to give back to their communities,
 - have significantly lower drug, cigarette, and alcohol use,
 - are twice as likely to make healthier choices,
 - report better grades and higher levels of academic competence, and
 - are nearly two times more likely to go to college.

Recommendations

- **Teacher Development, Curricular Integration, & Human Resources:** An increase in school-level support is needed for agricultural education, especially within elementary and middle school years, through increased financial support for resources and staffing, as well as further training and curricular integration. Increased cohesion between interested community partners and school-based PCNC staff would be beneficial. According to the 2015–2016 Kaua'i School Garden Network Survey,
 - The most commonly identified needs in school garden programs, in order of importance, were 1. Volunteer Help, 2. Funding, 3. Garden Coordinator/Staff, and 4. Program Sustainability.
 - Most important to the plans and vision of school garden programs were: 1. Curricular Integration, 2. Program Sustainability, 3. Cultivate Sustainability Awareness, & 4. Involve All Students.
 - Curriculum trainings to date include Kokua Hawai'i Foundation's ĀINA In Schools (K–6) and Project Learning Tree (PreK–12); 57 educators trained in 2015; teacher engagement would increase if *free* trainings were incorporated into school day, or at least become eligible for professional-development credit to incentivize.
- **Invest in School to Farm:** Increased investment in, and institutionalization of, high school and college-level internship and mentorship programs to bridge the gap between education and industry; this mirrors the Kaua'i recommendations made in the [2013 Hawai'i Agriculture Skills Panel Report](#). GoFarm is limited to new farmer training and doesn't yet have access to incubator resources, and Malama Kaua'i's Ag Internship Program is funded through small private grants. Investments into existing programs would support expansion and effectiveness. Supporting high schools and KCC in adopting for-credit internships will strengthen and provide stability for these efforts.
- **Higher Education Access:** There are limited educational options available at the college level. Increased availability of bachelor's-level educational options within the UH system, even if online/remote, would greatly enhance educational progression for residents. There is a high workforce demand for conservation-related ag professionals, but no educational programs available in forestry, conservation, or natural resource management.
- **Increase Collaboration:** Off-island programs are newly coming to island that replicate existing work being done by community-based organizations with a lack of cultural protocol or communication with existing networks and programs.

- **Other:** There is immense potential in entrepreneurship education related to agriculture and food businesses. Department of Commerce/U.S. Census Bureau figures suggest that approximately 25% of Kaua'i's work-age population is engaged as small business operators. Incorporating more curriculum, courses, and clubs within schools that focus on business development skills, such as Junior Achievement and Entrepreneurship Clubs. These educational topics also tend to focus on instilling self-determination, initiative, and accountability, providing our youth with soft skills and tools for success in any field they choose. Schools on other islands have incorporated agriculture and entrepreneurship education through instituting student-run farmers market booths, worm casting and plant sales fundraisers, CSAs, and more.

VI. Appendix of Resources



Preschool

- <http://growing-minds.org/farm-to-preschool/>

K–8

- [ĀINA In Schools](#): Kokua Hawai'i Foundation's standards-based K–6 curriculum, with lessons covering gardening, composting, and nutrition
- Cooking Up A Rainbow Curriculum by Kapi'olani Community College
- [Life Lab Science Program](#)
- [Kohala Center's Hawai'i School Garden Curriculum Map](#)
www.kohalacenter.org/hisgn/curriculum-map
 and Curriculum Resource Page, which includes a collection of recommended school garden curricula.
<http://kohalacenter.org/hisgn/hisgn-resources/school-garden-curriculum>
- The Hawai'i Island School Garden Network website (HISGN) has many resources for getting started, connecting with island resources, invasive species, starting a school orchard, and much more. www.kohalacenter.org/HISGN
- Edible School Yard
- HEEA

- [Veggie U, Hawaii Agricultural Foundation](#): 4th grade, 5-unit, 25-lesson plan for core curriculum for kids to grow their own vegetables in classroom.
- [Center on Disability Studies Aquaponics Education](#): HDOE career pathway curriculum for middle schools; includes mini aquaponics set ups that students create and maintain. The work is intended to prepare middle school students for the Aquaponics Maxi systems now on several high school campuses.
- [4-H \(CTAHR\)](#)
4-H has a very large collection of project resources for members interested in the following areas:
 - Citizenship & Civic Education
 - Communications & Expressive Arts
 - Consumer & Family Science
 - Environmental Education & Earth Sciences
 - Healthy Lifestyle Education
 - Personal Development & Leadership
 - Plants & Animals
 - Science & Technology

High School

- [Kaua'i Ag Internship Program](#): From Malama Kaua'i, the program provides paid internships to high school and college ag students during school break periods.
- [Career and Technical Education](#): Bernadette Howard
- [Aquapono Curriculum and In the Fields Programs](#): From Hawai'i Agricultural Foundation, connects middle and high school students with aquaponics curriculum and internships

Post-Secondary

- Hawaii Agriculture Education and Training Programs: [Click here for Excel version](#) (Excel, 100 KB) [Click here for PDF version](#) (PDF, 216 KB).
- [National Listing of Post-Secondary Sustainable Agriculture Programs](#): includes land-grant institutions
- [The Center for Agroecology and Sustainable Food System \(CASFS\) at UCSC](#): One of the oldest and most well-developed examples of a university center that thoroughly integrates research, undergraduate education, community outreach and education (including K–8) and practical training of organic farmers and gardeners.
- [The Apprenticeship in Ecological Horticulture at UCSC](#): The oldest organic farmer-training program in the nation; a key program within CASFS.
- [The Berkeley Food Institute](#): Integrated research, education, and Extension activities for sustainable food and agriculture systems.
- [The Center for Diversified Farming Systems](#): Research and education and extension activities promoting sustainable food and agriculture

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Workforce

- UC Santa Cruz Farmer Training Manuals (free online) based on [CASFS Farm & Garden Apprenticeship in Ecological Horticulture](#):
 - [Teaching Organic Farming & Gardening](#): focused on production
 - [Teaching Direct Marketing and Small Farm Viability](#): focused on small farm economic viability
- [2013 Hawaii Agriculture Skill Panel Report](#): The report is a culmination of ideas, priorities, recommendations, and action items from the skill panel meetings that DLIR held statewide from Dec 2011 to June 2012
- [Agriculture Labor Market and Career Information](#): HI Department of Labor and Industrial Relations
- [Soft Skills Survey Results and Analysis](#): HI Dept. of Labor report published June 2015

Other

- [Natural Resources Career Pathway Guide](#): A Kaua'i based model for communicating island-specific Career Pathway information and community resources to support teachers and students; includes career pathway maps as well as listings of employers, field trip sites, guest speakers, internships, and more (will be updated in 2016)
- [Hawaii Environmental Literacy Plan](#): From the Hawaii Environmental Education Alliance (HEEA)
- [Exemplary State](#): The work on Exemplary State over the last three years by Darrel Wong and Ken Kaneshiro has as central tenets food security with a strategy to engage families and communities in addition to schools in growing food.
- [Hawai'i After School Alliance](#): Recently launched with funding from the Mott Foundation and matching funds from local sources including HIDOE. The Alliance now has an Executive Director and board that are pulling together all after school resources and programs statewide.
- [Malama Honua](#): The Promise to Children stimulated by the worldwide voyage of Hokulea has a focus on sustainability and maintenance responsibilities for the land and oceans.
- [Trends in the Growth of Agroecology and Sustainable Agriculture Education Programing at the College Level](#): LA Times article