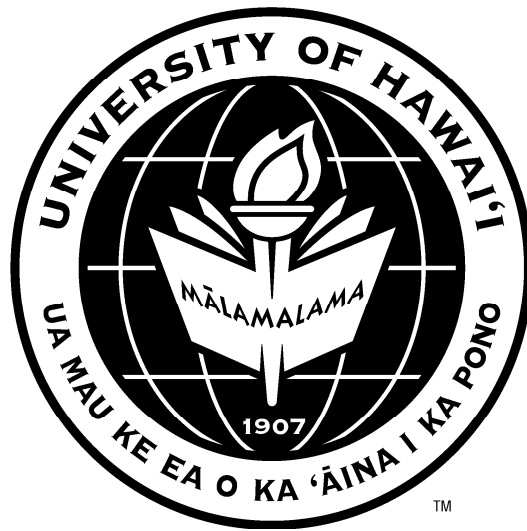


UNIVERSITY OF HAWAI‘I SYSTEM REPORT



REPORT TO THE 2019 LEGISLATURE

Final Report on a Coordinated Framework of Support for Preschool
Through Post-Secondary (P-20) Agriculture Education in Hawai'i

Senate Resolution 80 (2015)

December 2018

P–20 Agriculture Education Working Group

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I. Executive Summary

The average age of farmers in Hawai'i is over sixty years, and Hawai'i does not have an adequate-sized farming workforce for expansion of cultivated agricultural lands and food production. A primary cause of the shortage of new farmers in Hawai'i (which is mirrored by our overall shortage of teachers) is the decline during the past several decades of support for agriculture education from state government, including training for agriculture teachers, resulting in an insufficient interest in pursuing the fields of agriculture and natural resource management among youth. Prospective farmers face challenges in terms of access to land, and farming today requires a more diverse skill set than in the past, including crop and livestock production, marketing, food safety, regulatory compliance, environmental stewardship, business skills, and more. Whereas ancestral Hawaiians were completely self-sufficient, today Hawai'i imports approximately eighty-five to ninety percent of our food, and the health of Hawai'i's people, 'āina, and food systems is suffering.

In order to meet the State's aspirations for increased food security and self-sufficiency, the number of local farms and farmers, and the amount of food produced for local markets, will need to increase significantly. Agriculture education is key to the development of future farmers and to a society that values and understands the vital role of agriculture, food, fiber, and natural resource systems in advancing personal, local, and global well-being. During the past decade, a vibrant grassroots movement in support of agriculture education has emerged in Hawai'i, along with a marked increase in new farmer-training programs and student involvement in Future Farmers of America (FFA). To encourage this momentum, the Hawai'i State Senate in 2015 passed [Senate Resolution \(SR\) 80](#), an unfunded request that the University of Hawai'i (UH) at Mānoa College of Tropical Agriculture and Human Resources (CTAHR) “convene a working group to develop a coordinated framework of support for preschool through post-secondary (P–20) agriculture education and a plan for implementation,” including any proposed legislation, through annual reports to the Hawai'i State Legislature prior to the 2017, 2018, and 2019 legislative sessions.

In response to this charge, CTAHR convened the P–20 Agriculture Education Working Group, which includes both governmental and non-governmental stakeholders. This report has been developed and refined by the working group over three years and includes 1) a Coordinated Framework of Support for P–20 Agriculture Education with a plan for implementation, 2) an overview of the working group and career opportunities in agriculture and food systems, and 3) a summary of current local resources for P–20 agriculture education. This report reflects the experience and research of the working group participants and may not include all available resources and strategies.

Implementation of the Coordinated Framework of Support for P–20 Agriculture Education in Hawai'i (Figure 1 and Section II) requires that a P–20 Agriculture Education Coordinator position be established within UH CTAHR and funded for the purposes of overseeing ongoing communication and collaboration of the P–20 Agriculture Education Working Group and spearheading the **Implementation Plan (Figure 2 and Section III) as follows:**

Teacher Development: Prioritize teacher training in agriculture and food systems education at all levels (P–20) for those preparing to become teachers (“pre-service teachers”), as well as additional professional development for those already in classrooms (“in-service teachers”).

Curricular Integration: Integrate agriculture education into the core curriculum in all subject areas at all levels (P–20).

Agriculture Educators: Establish and fund positions at the state, community, and school levels that directly support teacher development and curricular integration around agriculture and food systems.

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. We are confident that this vision can and will be achieved through implementation of the recommendations put forth in this report.

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Photo courtesy Hoa‘āina o Mākaha

II. Coordinated Framework of Support for P–20 Agriculture Education in Hawai'i

The Coordinated Framework of Support for P–20 Agriculture Education in Hawai'i brings together governmental and non-governmental stakeholders for a common goal, increasing the depth, breadth, and scope of agriculture and food systems education in the state. Students who develop literacy in agriculture, ecology, and sustainability will become farmers and local food producers, consumers who buy local, and businesspeople and policy-makers who put the earth first. See Figure 1 for a visual representation of the Coordinated Framework of Support for P–20 Agriculture Education in Hawai'i.

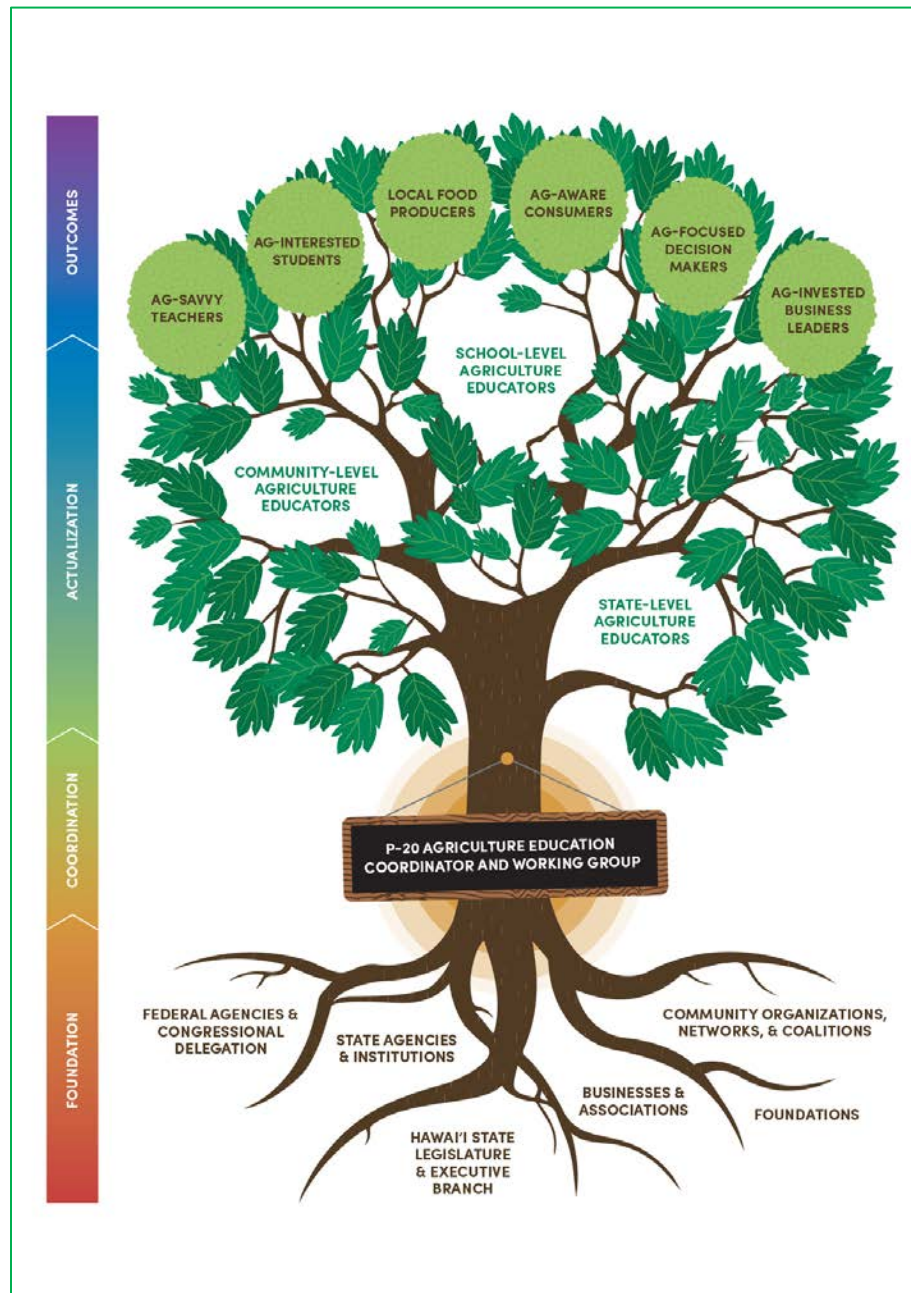


Figure 1. Coordinated Framework of Support for P–20 Agriculture Education in Hawai'i

Foundation

A Coordinated Framework of Support for P–20 Agriculture Education in Hawai'i requires collaboration and funding from the following key entities:

- Federal agencies (US Departments of Agriculture, Education, and Health and Human Services) and Congressional delegation
- Hawai'i State Legislature and Executive branch
- State agencies and institutions
- Foundations
- Community organizations, networks, and coalitions
- Businesses and associations

Coordination

Assessment, planning, action, evaluation, and refinement are carried out by the following key entities:

- P–20 Agriculture Education Coordinator
- P–20 Agriculture Education Working Group

Actualization

Direct implementation is carried out by trained personnel who provide technical assistance and training in the development of agriculture education programs:

- Agriculture Educators at the state, community, and school levels (examples in Section III)

Outcomes for Hawai'i

Effectuation of the Coordinated Framework of Support for P–20 Agriculture Education in Hawai'i will result in the following desired outcomes:

- Increased number of teachers trained in agriculture education.
- Increased number of students exposed to agriculture education at all levels (P–20) in public, charter, and independent schools.
- Increased number of public school students entering and completing the CTE Natural Resources Career Pathway in agriculture.
- Increased number of students entering and completing higher education programs in agriculture and food systems.
- Increased number of local farms and food producers.
- Increased local food supply and food security.
- Increased support for agriculture, including supportive legislation and funding for the Hawai'i Department of Agriculture and agriculture education programs and positions in the Hawai'i Department of Education.

III. Implementation Plan

The Implementation Plan outlines the steps needed to actualize the Coordinated Framework of Support for P–20 Agriculture Education in Hawai'i. As its first step, the Plan requires the funding and hiring of a P–20 Agriculture Education Coordinator, who will drive and supervise the remaining steps of teacher development, curricular integration, and coordination and support of agriculture educators. See Figure 2 for a visual representation of the Implementation Plan to develop the Coordinated Framework of Support.

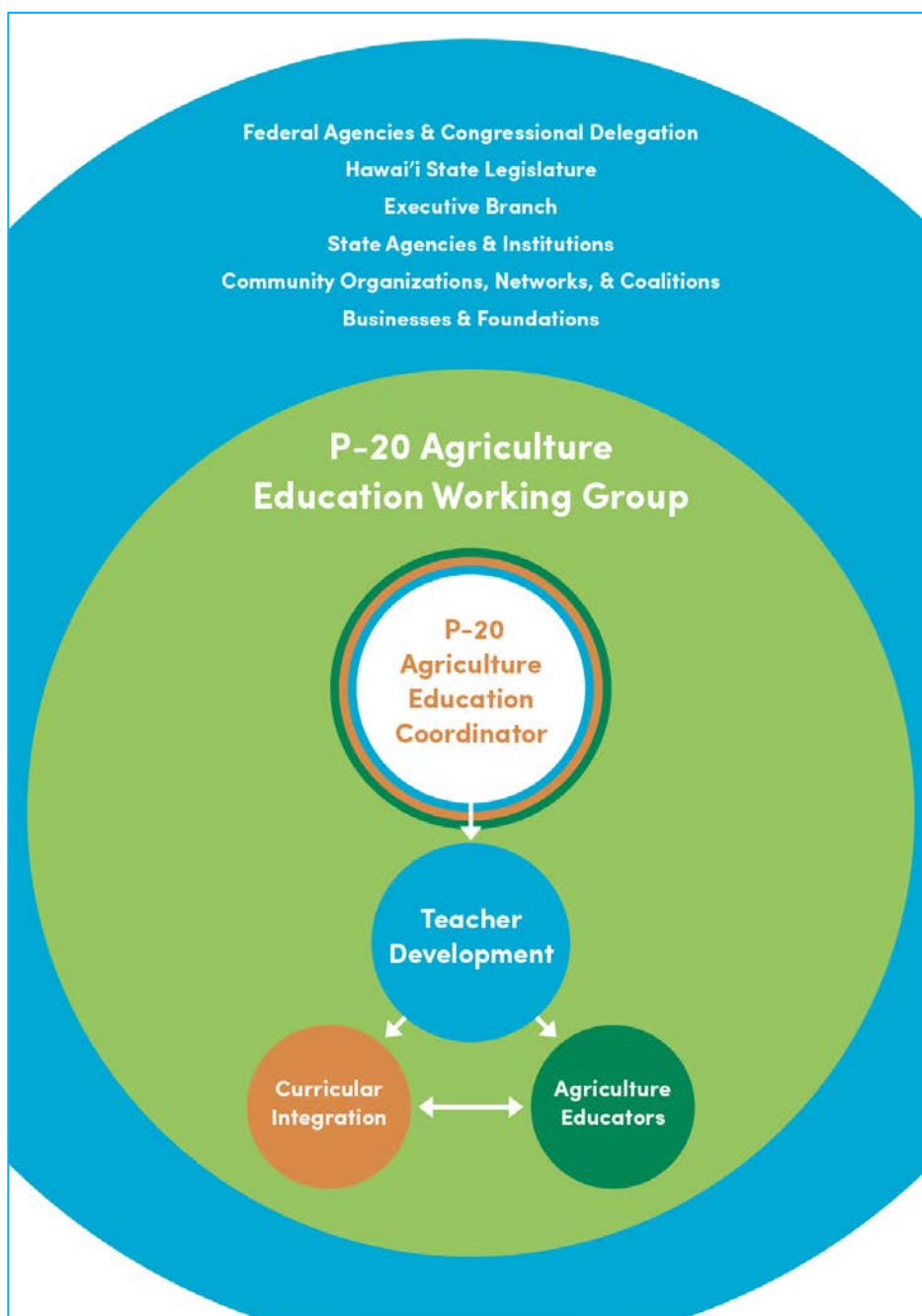


Figure 2. Implementation Plan to develop the Coordinated Framework of Support

P–20 Agriculture Education Coordinator

Establish and fund a P–20 Agriculture Education Coordinator position within UH CTAHR to oversee continued collaboration of the P–20 Agriculture Education Working Group and spearhead implementation of the Coordinated Framework of Support for P–20 Agriculture Education in Hawai'i.

Position Location:

UH CTAHR Office of Academic and Student Affairs

Position Type:

Permanent Administrative, Professional or Technical Position, Band B

Reports To:

UH CTAHR Associate Dean of Academic and Student Affairs

Funding Request:

\$150,000 per year (travel, meeting expenses, supplies, and salary plus fringe benefits for a permanent position)

Key Duties:

- **Teacher Development:**
 - Coordinate training in agriculture and food systems education at all levels (preschool through post-secondary, P–20) for Hawai'i's teachers, child care providers, professors, and informal educators statewide through these steps:
 - Working with Hawai'i State Approved Teacher Education Programs (SATEP) to integrate agriculture and food systems education into teacher development programs for those preparing to become teachers (“pre-service”) at all levels (P–20);
 - Working with stakeholders to identify, coordinate, and promote professional development opportunities for active (“in-service”) teachers and other educators;
 - Working with UH Cooperative Extension to provide technical support in agriculture and agriculture education to educators and schools; and
 - Working with UH College of Education (COE) to establish a “4+1 program” to develop graduates with a bachelor's degree from CTAHR and teaching license from COE (reducing the amount of time needed to obtain teacher licensure).
- **Curricular Alignment:**
 - Maintain an online calendar, email listserv, and social media accounts, and publish a monthly newsletter announcing professional development opportunities and available resources (including curriculum) related to agriculture and food systems education.
 - Maintain an up-to-date webpage publicizing current P–20 agriculture and food systems education resources in Hawai'i and abroad (based on Section VI of this report).
- **Coordination and Support of Agriculture Educators:**
 - Conduct ongoing surveys to assess the status of agriculture educator positions at the state, community, and school levels.

- Support agriculture educators by providing networking and professional development opportunities and access to curricular and other resources.
- **Capacity Building:**
 - Coordinate quarterly meetings and reports of subcommittees (by age group: PreK, K–8, 9–12, 13–20, Workforce) of the P–20 Agriculture Education Working Group and biannual meetings of the full working group.
 - Coordinate with the P–20 Agriculture Education Working Group to plan and conduct ongoing needs assessments and progress evaluations.
 - Cultivate new partnerships and seek alignment with other relevant initiatives, including the Hawai'i Department of Labor and Industrial Relations (DLIR) Agriculture Workforce Advisory Group.
 - Identify and write proposals for additional sources of funding.
 - Oversee publication of an annual report.

Teacher Development

Prioritize teacher training in agriculture and food systems education at all levels (P–20) for those preparing to become teachers (“pre-service teachers”), as well as additional professional development for those already in classrooms (“in-service teachers”).

Courses and workshops for pre-service and in-service teachers should include the following:

- **‘Ike Hawai’i**, or the integration of indigenous knowledge and culture and their contributions to food system sustainability, climate change resilience, social equity, and ‘āina-based education;
- **Immersive experiences** in agriculture and food systems through which the teachers can experience firsthand where food comes from and how it grows;
- **Curriculum development and integration** around agriculture, food systems, and garden-/farm-/ocean-based learning that connects to national and state educational standards in core subjects;
- **Outdoor classroom management** skills and best practices for **safety**;
- **Nutrition, wellness, and health** integration; and
- **Environmental/peace/sustainability education.**

Curricular Integration

Integrate agriculture education into the core curriculum in all subject areas at all levels (P–20).

Agriculture education (including garden-/farm-/ocean-based learning) offers students the engaging opportunity to connect to real-life learning in a variety of academic subjects including STEAM (science, technology, engineering, arts, and math), nutrition, food science, Hawaiian studies, language arts, health, social studies, and more. Garden-based learning is also associated with increased social emotional skills among students.

Meaningful curricular integration can be achieved within all levels of education by these means:

- Increasing access to and awareness of **available curricula**;
- Supporting further **curriculum development**; and
- Expanding collaborative efforts to increase **coordinated professional development opportunities** for teachers at all levels.

Coordination and Support of Agriculture Educators

Establish and fund positions at the state, community, and school levels that directly support teacher development and curricular integration around agriculture and food systems.

Examples are provided for existing [E] and proposed [P] agriculture educator positions. Of the agriculture educators that currently exist, many are privately funded. There is a need for increased state investment in this area.

- **Agriculture Educators, State-Level:**
 - P–20 Agriculture Education Coordinator [P]
 - UH CTAHR Statewide Master Gardener Coordinator [E]
 - HIDOE Career and Technical Education (CTE) Resource Teacher (Agriculture, Food, and Natural Resources Career Pathway) [E]
 - HIDOE School Garden Education Specialist [P]
- **Agriculture Educators, Community-Level:**
 - UH CTAHR Extension Agents (complex-area level) [P]
 - HIDOE CTE/STEM/Science Resource Teachers [E]
 - HIDOE Agriculture/Sustainability Resource Teachers [P]
 - Farm to School/Food Systems Coordinators (district/complex-area level) [P]
- **Agriculture Educators, School-Level:**
 - CTE Agriculture Teachers (Grades 6–12) [E/P; growth needed]
 - School Garden Coordinators (Grades PreK–12; oversee garden-based learning at schools as part-time teachers or full-time licensed teachers) [E/P; growth needed]



Photo courtesy East Hawai'i 4-H

IV. The P–20 Agriculture Education Working Group

Purpose & Background

The [National Council for Agricultural Education](#) defines agricultural education as a systematic program of instruction available to students desiring to learn about the science, business, and technology of plant and animal production and/or about environmental and natural resources systems. An additional goal of agriculture education is to reconnect all people with the ‘āina: the land and waters that feed us physically, mentally, and spiritually.

The purpose of the P–20 Agriculture Education Working Group is to assess the current state of agriculture education in Hawai‘i, prioritize needs, and identify next steps toward the creation of a holistic framework of support for P–20 (preschool through post-secondary) agriculture education in the state.

The adoption of Senate Resolution 80 (2015), which initiated the P–20 Agriculture Education Working Group, followed the passage of the 2015 Hawai‘i Farm to School Bill, Act 218. This, our third and final Report, identifies the work that has formed the foundation of agriculture education statewide over the past decade. The report reveals current gaps in the continuum and gives recommendations for the development of a coordinated framework of support that will renew both education and agriculture in grades PreK–20. This group of experienced teachers, administrators, and other experts in the field of agriculture education saw this three-year opportunity as a way to shift our state’s vision and practice in the fields of agriculture, education, health, environment, and culture.

The Coordinated Framework of Support for P–20 Agriculture Education is essential to revitalize Hawai‘i’s agricultural economy, food and farming systems; develop lifelong healthy eating habits and consumer preferences; and improve health. Hawai‘i was built on agriculture; the soil, water, air, and year-round sun and warmth are some of our greatest assets. Future citizens will gain skills, knowledge, and career pathways that will effectively care for the ‘āina (the land that literally feeds and sustains our economy), and create an “outdoor classroom,” a learning garden on every school campus. This outdoor learning laboratory will be used as an instructional unifying strategy to further place-based and project-based learning along with nutrition and environmental education. The strategy is a long-term solution to the challenges around food, health, and the environment that we face today.



Photo courtesy HIP Agriculture

Participants

From August 2015 through December 2018, active P–20 Agriculture Education Working Group participants have included representatives from the following groups:

GOVERNMENTAL ORGANIZATIONS

1. Hawai'i Department of Agriculture
2. Hawai'i Department of Education
3. Hawai'i Department of Health
4. Hawai'i Department of Labor & Industrial Relations
5. Office of Hawaiian Affairs
6. United States Department of Agriculture, Farm Services Agency
7. University of Hawai'i, State Office for Career and Technology Education
8. University of Hawai'i at Mānoa, College of Education (COE)
9. University of Hawai'i at Mānoa, College of Tropical Agriculture and Human Resources (CTAHR)
10. Hawai'i Master Gardener Program (CTAHR)
11. Hawai'i P–20 Partnerships for Education
12. GoFarm Hawai'i (CTAHR)
13. University of Hawai'i System, Hawai'i Community College
14. University of Hawai'i System, Kapi'olani Community College
15. University of Hawai'i System, Leeward Community College
16. University of Hawai'i West O'ahu

NON-GOVERNMENTAL ORGANIZATIONS

1. Agricultural Leadership Foundation
2. Future Farmers of America
3. Grow Some Good, Maui School Garden Network
4. Hawai'i Agricultural Foundation
5. Hawai'i Association of Independent Schools
6. Hawai'i Environmental Education Alliance
7. Hawai'i Farm Bureau
8. Hawai'i Farmers Union United
9. Hawai'i Farm to School Hui (Hawai'i Public Health Institute)
10. Hawai'i Food Policy Council
11. Hawai'i Homeschool Hui
12. 'Iolani School (O'ahu Farm to School Network)
13. Kamehameha Schools
14. Kōkua Hawai'i Foundation
15. Mālama Kaua'i (Kaua'i School Garden Network)
16. MA'O Organic Farms
17. Pacific Resources for Education and Learning (PREL)
18. Pacific Gateway Center
19. Sust'ainable Molokai (Molokai Farm to School Network)
20. The Bennett Foundation
21. The Kohala Center (Hawai'i Island School Garden Network and FoodCorps Hawai'i)

Progress

The group has thus far accomplished the following:

- Held regular meetings and created yearly reports to the Legislature;
- Identified and continually developed a coalition from both public and private sectors to coordinate and contribute to policy development for P–20 agricultural education;
- Built awareness among stakeholders of the 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 reduce redundancies;
- Identified a sustainability narrative as an optimal approach toward incorporating agriculture into education;
- Identified strengths, opportunities, and gap areas PreK–20;

- Created a map of resources available for P–20 agriculture education;
- Identified opportunities for partnerships;
- Drafted a “Coordinated Framework of Support for P–20 Agriculture Education in Hawai‘i”; and
- Created recommendations for policy support, legislation, and funding.

Vision

To create a statewide Coordinated Framework of Support for P–20 Agriculture Education in Hawai‘i, the group developed 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, not fragile. These systems will endure tests of climate change and geopolitical instability. When built on the enduring principles of nature, this system design will result in dynamic and resilient whole systems that can be used to teach STEAM (Science, Technology, Engineering, Agriculture/Arts and Math) skills and principles. The Coordinated Framework of Support for P–20 Agriculture Education in Hawai‘i builds agricultural programs with a strong emphasis on sustainable practices and an integration of agriculture education from preschool through workforce entry, including a strong higher-education sustainable systems component.

The P–20 Agriculture Education Working Group aims to develop an articulated continuum for the integration of Hawai‘i’s currently existing programs into a framework that supports a coordinated system of agricultural education in the state. We envision government and the non-governmental community organizations co-creating farm to school programs feeding into FFA and 4-H youth programs, that feed into farmer training programs, that feed into on-farm farmer apprenticeships, that will feed citizen gardening, agricultural industries and the food production and value-added economy. The P–20 Agriculture Education Working Group aims to articulate and create this integrated approach to agricultural education, with the goal of food security and resilience for the state. These systems are also a means for the hands-on learning that students learn from and come to appreciate. P–20 Agriculture Education Working Group undertakes this task in the spirit of collaboration with all involved, while remaining focused on creating an agricultural workforce and citizenry that prepares for and mitigates climate change, creates a sustainable and resilient food system, and strengthens the agricultural production-based economy for Hawai‘i.

P–20 Agriculture Education Participation

The P–20 Agriculture Education Working Group should include regular participation from representatives of the following groups, in addition to the consistent and regular participants listed above:

- Legislative leaders on agriculture and education

- Representatives from Hawai'i Department of Labor and Industrial Relations (DLIR) and from DLIR's Agriculture Workforce Advisory Group
- Hawai'i Department of Education (HIDOE) Office of Curriculum and Instructional Design (OCID)
- Representatives from interested community non-profit stakeholders
- Representatives of ocean agriculture such as Sea Grant and others



Photo courtesy Sust'ainable Molokai

V. Careers in Agriculture, Food Systems, and Education

The table below lists the careers that exist today. Agriculture education must prepare students for future possibilities by developing skills in design thinking and problem-based and project-based learning.

HIDOE's Career and Technical Education (CTE) [Hawai'i Career Pathway System Handbook](#) identifies the following as examples of occupations for which the CTE Natural Resources Career Pathway prepares or begins to prepare graduates:

<u>Occupational Cluster</u>	<u>Occupational Examples</u>
Agriculture/Aquaculture Production	Ag-Aqua Engineer Agricultural Extension Agent Agricultural Inspector Agricultural Manager Agricultural Science Teacher Agricultural Technician Agriculture and Food Science Technician Agronomist Aquacultural Manager Farm Equipment Technician Farm Labor Contractor Field Manager Irrigation Engineer Technician Marine Biologist Soil Scientist
Animal Systems	Animal Science Teacher Animal Scientist Beekeeper Farm Manager Livestock Extension Agent Range Manager Veterinarian Veterinary Assistant
Environmental Resource Management	Biofuel Processing Technician Biomass Engineer Bio-Resource Manager Cartographer Conservation Scientist Environmental Compliance Inspector Environmental Engineer Environmental Resource Technician Environmental Science Teacher Environmental Scientist Fish and Game Warden Forest and Conservation Technician Forester Forestry Manager Geologist

<u>Occupational Cluster</u>	<u>Occupational Examples</u>
	Geophysical Technician Hydroelectric Plant Technician Hydrologist Hydrology Technician Marine Biologist Park Naturalist Soil and Water Conservationist Wildlife Biologist Zoologist
Horticulture	Arboriculturist Architectural Landscaper Botanist Entomologist Ethnobotanist Field Technician Floral Designer Floriculturist Greenhouse Technician Grounds Manager Nursery Technician Soil and Plant Scientist
Natural Resources Biotechnology	Biochemist Biophysicist Biotechnology Technician Field Manager Genetic Engineer Geneticist



Photo courtesy Hoa'āina o Mākaha

Examples of Food Systems Jobs:

- Farm Manager
- Farm to School Coordinator
- Farmers' Market Access and Equity Program Coordinator
- Farmers' Market Manager
- Food Literacy Coordinator
- Food Network Non-Governmental Organization (NGO) Executive Director or Program Officer (e.g., [Gorge Grown](#))
- Food Policy Analyst
- Food Service Manager
- Food Systems Project Director or Program Coordinator (e.g., [Blue Zones](#), [Food Tank](#))
- Food Waste Reduction Coordinator
- Local Food Access Coordinator
- Local Food Systems Project Coordinator (e.g., [Buy Fresh, Buy Local](#))
- Nutritionist
- Organic Certification Inspector/Agent
- School Garden Educator

<https://elist.tufts.edu/wws/info/comfoodjobs>

<http://foodsystmsnetwork.org/index.php/jobs>

<http://nesawg.org/job-resources>



Photo courtesy CTAHR Food Science and Human Nutrition Council

VI. Current P–20 Agriculture Education Resources in Hawai‘i

The following is a collection of programs and resources related to agriculture education across the Islands, organized by the grade level/age group served. Programs and resources are active and available statewide unless otherwise stated.

Preschool (Early Childhood Education, ECE)

ECE Wellness Guidelines

Wellness Guidelines for Nutrition and Physical Activity in Hawai‘i’s Early Care and Education Settings includes best practices for cooking and eating nutritious foods and beverages, nutrition learning experiences, nutrition environment, and staff and family engagement that align with Farm to ECE goals. <https://health.hawaii.gov/snap-ed/files/2018/03/wellnessguidelines.pdf>

Farm to Keiki

Farm to Keiki provides early childcare educators with the tools they need to integrate gardening and nutrition education into their curriculum throughout the entire school year. The *Farm to Keiki* book emphasizes environmental stewardship, lifelong healthy habits, and access to local fresh fruits and vegetables in school meals and snacks by introducing concepts of local food purchasing, gardening and nutrition curriculum, school gardens and farm field trips, and a wellness policy into the school environment. The *Farm to Keiki* book is offered as a free download and a hard copy for purchase. Farm to Keiki is offering free workshops on the book to teachers on all Hawaiian Islands in 2019. www.farmtokeiki.org



Photo courtesy CTAHR Children’s Healthy Living Project

Hawai'i Farm to ECE Statewide Network

The network is in the beginning stages of development via the Farm to ECE working group of the Hawai'i Farm to School Hui. Key lead organizations include the Hawai'i Department of Health, Hawai'i Child Nutrition Program, The Bennett Foundation, Farm to Keiki, Kōkua Hawai'i Foundation, Charter Commission PreK Program, Kapi'olani Community College (KCC) Culinary Arts Department, HCAP Head Start on O'ahu and the Hawai'i Farm to School Hui. During school year 2018–19, the Hawai'i Department of Health and The Bennett Foundation are conducting a pilot Farm to ECE Learning Collaborative model with HCAP Head Start classrooms. Professional development workshops were delivered to early childhood wellness stakeholder groups, Charter Commission PreK Program teachers, and attendees at the annual Hawai'i Association for the Education of Young Children conference in 2017 and 2018. Curriculum resources, including a photo library of Hawai'i produce, are available on the "Cooking Up A Rainbow" website: <http://culinary.kapiolani.hawaii.edu/cooking-up-a-rainbow/>.

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>

Boys & Girls Club of Hawai'i

Two out of seven after-school sites on Maui and Lāna'i have early-phase gardening programs.

www.bgch.com

Exemplary State Initiative

In the face of escalating social ecological challenges driven by climate change impacts in the Hawaiian Islands, the "Exemplary State Initiative" envisions a statewide effort in which K–12 schools in their respective ahupua'a communities participate in place-based STEM collaborations in which teachers, students, Hawaiian cultural experts, researchers, engineers, technologists and resource managers are engaged in research activities that will contribute to Hawai'i's scientific knowledge base about the current state of biodiversity, climate, and environmental human health. Through these STEM collaborations, communities will be empowered in a participatory process to deal directly with issues relevant to their ahupua'a, including disaster management, flood mitigation, natural resource management, pollution, infectious disease, etc. <http://hbmpweb.pbrc.hawaii.edu/exemplary/>

Grow Some Good (Maui)

Grow Some Good is a non-profit organization based on Maui and dedicated to creating hands-on outdoor learning experiences that cultivate curiosity about natural life cycles, connect students to their food sources, and inspire better nutrition choices. In addition to helping establish food gardens and living science labs in local schools, Grow Some Good provides resources and curriculum support through community partnerships in agriculture, science, food education, and nutrition. www.growsomegood.org

Hawai'i Afterschool Alliance

The Hawai'i Afterschool Alliance is dedicated to advancing sustainable, high-quality out-of-school time programs to create a system of support to improve academic, social, emotional and physical outcomes for children and families. www.hawaiiafterschoolalliance.org

Hawai'i Agricultural Foundation (HAF)

HAF is a non-profit organization created to promote agriculture and farming. www.hawaiiagfoundation.org

Where Would We Be Without Seeds is a one-unit, three-lesson curriculum for 2nd-graders that focuses on foods grown from seeds, plant life cycles, and the local agriculture industry. This interactive program helps students understand the fundamentals of the farming process.

Veggie U, piloted in 2013 in Hawai'i, 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.

Aquapono curriculum teaches middle and high school science through aquaponics.

In the Fields Partnership Program introduces local high school students to the agricultural industry and the diversity of careers available in it. Throughout the academic year, participating classrooms visit three different types of farms—conventional, biotech, and organic—and have the opportunity to garner real-life, hands-on experiences through workplace mentorships. Business owners are also able to interact with educators to ensure that what students are learning aligns with the skills needed by industry.

Kids Cooking Local is a partnership with After-School All-Stars Hawai'i and the Boys and Girls Club of Hawai'i, where students learn about the importance of agriculture and how to work with farm-fresh ingredients in the kitchen. Interactive cooking classes teach students about various types of produce, food preparation, kitchen skills such as food storage and washing produce, proper cleaning practices, and how to be creative in cooking.

Hoa 'Āina O Mākaha (O'ahu)

Since its founding in 1979, Hoa 'Āina O Mākaha (Land Shared in Friendship) has worked hand-in-hand with its neighbors to create a 5-acre community garden and educational resource center where people of all ages can experience the remarkable cultural, natural, and community strengths of the Wai'anae Coast. Through educational, 'āina-based (land-based) programs deeply rooted in Hawaiian culture, the organization connects the community, students, and families to nature so that they are able to gain a deeper sense of the relationship between individual, community, and environmental health and well-being. Hoa 'Āina O Mākaha serves approximately 4,000 participants annually. Its mission is "Creating peaceful communities in harmony with nature, through the eyes, hands, and hearts of the children."

<https://www.hoainaomakaha.org/>

Hawai'i Department of Education (HIDOE)

'Āina Pono Hawai'i State Farm to School Program aims to improve childhood health, support local agriculture, and increase Hawai'i's food security by increasing the amount of nutritious,

fresh, local food served in school meals statewide, while increasing the number of students eating school breakfast, lunch, and other school meals. 'Aina Pono also supports the provision of K–12 nutrition, health, and agriculture education; school gardens; and greening cafeterias statewide. Oversight for the program has been managed by the Office of the Lieutenant Governor and the HIDOE School Food Services Branch (SFSB). Funding to establish one full-time farm to school coordinator position in HIDOE SFSB was approved by the Hawai'i State Legislature in 2018. www.ainapono.org, www.hawaiipublicschools.org/TeachingAndLearning/HealthAndNutrition/f2s/Pages/default.aspx

Career and Technical Education (CTE) (see “High School” section)

Center on Disability Studies Aquaponics Education: HIDOE 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.

Hawai'i Department of Health (HDOH)

HDOH School Health is an active participant and supporter of Farm to School and Farm to ECE in Hawai'i. <http://health.hawaii.gov/school-health/>

Hawai'i Physical Activity and Nutrition (PAN) Plan 2013–2020

HDOH oversees the development of the PAN Plan, which recommends increasing educational opportunities for students and staff to learn about nutrition and agriculture by increasing the number of schools with school gardens and establishing positions in the Hawai'i Departments of Education and Agriculture to support school gardens and agriculture education programs.

Safety and Wellness Survey (SAWS)

SAWS is administered annually by HIDOE and HDOH to all K–12 public non-charter schools in Hawai'i in order to monitor implementation of the HIDOE Wellness Guidelines. Data from the 2016–2017 school year show that 88% or 225 of 256 K–12 public schools in Hawai'i have gardens, and 80% or 206 schools use gardens for instruction. Fifty-one percent of K–12 public schools use school gardens for science instruction, followed by Hawaiian Studies (35%); health education, including nutrition (29%); and CTE agriculture (20%).



Photo courtesy Grow Some Good

Hawai'i Environmental Education Alliance (HEEA)

HEEA's mission is to foster and develop high quality environmental education by building relationships and organizational capacity through networking and professionalism to promote education about environmental issues in Hawai'i. HEEA led development of the Hawai'i Environmental Literacy Plan which incorporates the importance of agriculture education (<http://heea.org/Files/eehi/2015/Final2015revisions.pdf>). HEEA hosts an active website with a calendar and resources, and offers Pilina professional development programs across the state, aiming to strengthen systems of support for students and teacher success around place-based learning in Hawai'i's communities. www.heea.org

Hawai'i Farm to School Hui

The Hawai'i Farm to School Hui is a statewide network comprised of five island-level networks (Hawai'i Island, Maui & Lāna'i, Moloka'i, O'ahu, and Kaua'i), community organizations, schools, and state agency representatives with a collective mission to strengthen Hawai'i's farm to school movement. State agency partners include the Hawai'i Department of Health, Hawai'i Department of Education (Hawai'i Child Nutrition Programs, School Food Services Branch, Facilities Development Branch, Office of Curriculum and Instructional Design, Office of Hawaiian Education, Community Engagement Office), Hawai'i Department of Agriculture, and the University of Hawai'i. The three core elements of successful farm to school programs are: 1) school gardens, 2) education (agriculture, culinary, nutrition, food systems), and 3) school food improvements through local food procurement. The Hui formed in 2010 and became a program of the Hawai'i Public Health Institute in October 2017. Core members of the Hui meet quarterly and the Hui Coordinator staff position was established in 2014. <http://www.farmtoschoolhui.org/>

Hawai'i Institute of Pacific Agriculture (Hawai'i Island)

Committed to educating and empowering the next generation of young farmers, the Hawai'i Institute of Pacific Agriculture (HIP Ag) offers a variety of programs designed to engage Hawai'i's youth in sustainable agriculture, land stewardship, and healthy lifestyles. Through field trips, in-class presentations, middle school campouts, afterschool and summer programs, immersion courses and internships, HIP Ag instructors provide interactive, hands-on, place-based and STEAM learning opportunities. www.hipagriculture.org

Kōkua Hawai'i Foundation (KHF)

'ĀINA In Schools is a farm to school program of KHF that launched in 2006. The 'ĀINA In Schools curriculum offers standards-based, multi-subject, hands-on lessons for grades K–6 covering nutrition, gardening, and composting. 'ĀINA In Schools connects children to their local land, waters, and food to grow a healthier Hawai'i. The program also promotes field trips to local farms and chef cooking demonstrations in classrooms, as well as waste reduction, and educational opportunities for families and community members. During the 2018–2019 school year, KHF is working directly with 23 O'ahu elementary schools that have implemented the 'ĀINA In Schools program and to date has trained 600 educators from over 250 schools and educational organizations across the state to implement the 'ĀINA In Schools gardening, composting, and nutrition curricula. www.kokuahawaiifoundation.org

Māla'ai: The Culinary Garden of Waimea Middle School (Hawai'i island)

Māla'ai is a one-acre organic outdoor living classroom adjacent to and serving all students of Waimea Middle Public Conversion Charter School; it is the demonstration garden for the Kū 'Āina Pā School Garden Teacher Training Program (see The Kohala Center). This unique program was founded in 2005 and 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

Mālama Kauaʻi

Kauaʻi School Garden Network (KSGN)

KSGN employs several AmeriCorps VISTAs to assist with capacity-building services such as new project development, grant writing, fundraising, in-kind donation attainment, volunteer recruitment, and more for school gardens, food and natural resources programs.

www.malamakauai.org/mk/programs-3/kauai-school-gardens/

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. They also incorporate fresh produce deliveries to schools through their Village Harvest gleaning partnership program with Kauaʻi Master Gardeners. www.malamakauai.org/mk/youth-food-programs

Maui School Garden Network (MSGN)

Operated in partnership with Grow Some Good, MSGN serves over 40 schools on Maui and Lānaʻi by providing training, technical support, resources, and more. MSGN's 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.maui-school-gardennetwork.org

Oʻahu Farm to School Network (ʻIolani School)

Launched in 2006, OFSN is a network of school garden support organizations (SGSOs) coordinated through ʻIolani School and that includes Kōkua Hawaiʻi Foundation, UH CTAHR Oʻahu Master Gardeners, The Green House, and more. OFSN conducts professional development programs for educators and offers technical assistance to schools as available.

Sustʻāinable Molokai

Molokai Farm to School Network

Sustʻāinable Molokai networks with schools to support existing farm to school and school garden programs and helps fill in the gaps, working with teachers and cafeteria managers and performing administrative tasks. Sustʻāinable Molokai also works in the area of school food procurement, operating a food hub to bring local farmers' products into the school Fresh Fruit & Vegetable Program (FFVP). www.sustainablemolokai.org

The Kohala Center (TKC)

TKC supports a variety of agriculture education initiatives across grade and experience levels:

Hawaiʻi Island School Garden Network: Founded in 2008 and administered through The Kohala Center's agricultural education programs, HISGN supports over 60 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 Kū 'Āina Pā 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. 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 organization that connects kids to healthy food in schools. Since 2013, FoodCorps has placed AmeriCorps members in high-needs public schools in Hawai'i to provide hands-on education in the school garden, classroom, and cafeteria, support healthy school meal initiatives, and promote a schoolwide culture of health. FoodCorps AmeriCorps members are emerging leaders who dedicate one to two years of public service and gain training and professional development experience in the areas of farm to school, school food, agriculture, education, and public health nutrition. In 2017-2018, nine FoodCorps AmeriCorps service members:

- Delivered 2448 hours of school garden, nutrition, and culinary education to 3711 students;
- Conducted over 300 tastings in the classroom and garden;
- Engaged over 350 volunteers; and
- Supported 13 school gardens on O'ahu and Hawai'i Island.

During the 2018-2019 school year, 9 FoodCorps Hawai'i Service Members serve 9 schools on 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

The HI-MEET Program (Hawai'i Meaningful Environmental Education for Teachers) trains and supports teachers to conduct relevant field research activities that are aligned with Common Core and Next Generation Science Standards. <http://kohalacenter.org/hi-meet>

Ke Kumu 'Āina provides K–12 students and teachers the opportunity to learn and teach from their own 'āina by offering a variety of student and teacher programs and services year-round, both during school and intersessions. <http://kohalacenter.org/ke-kumu-aina>



Photo courtesy O'ahu Farm to School Network, 'Iolani School

UH CTAHR

Gene-ius Day Program (K–12)

The Gene-ius Day program, developed by Dr. Ania Wieczorek, is a part of the CTAHR, UH Mānoa, broader K–12 STEM and agriculture educational efforts. The mission of this program is to kindle curiosity and create lifelong learners by creating aspirations in Hawai'i's school-age students to study science, agriculture, and to pursue this passion into college. Over three years since its inception, the program has hosted 6,000 students. Hawai'i's abundant natural resources and unique climate, plants and animals, environmental topics and themes are ideal for kindling curiosity among local students and are well integrated into the Gene-ius Day curriculum. Of the 81 Gene-ius Day classes that have been developed for students grades 1–12, 50 classes (62%) have an environmental/agriculture focus. Classes cover topics such as climate change, greenhouse gas, animal & plant diversity, ecosystem cycles, renewable vs. non-renewable resources, aquaponics, soil health, watersheds, ahupua'a and more. The Gene-ius Day programs offer a unique opportunity to expose students to the STEM concepts behind processes such as global warming, ocean acidification, etc. so they can have a better understanding of causes and effects. www.ctahr.hawaii.edu/geneius-day

Waipā Foundation (Kaua'i)

Waipā Foundation works with the community to manage the 1,600 acre ahupua'a of Waipā, where kalo and other foods are grown. Waipā Foundation welcomes learners of all ages to explore how native Hawaiian values and practices apply to modern life through youth programs, workshops and group visits that feature transformative, hands-on learning. www.waipafoundation.org

High School

Hawai'i Department of Education (HIDOE)

Career and Technical Education (CTE): During the 2017–2018 school year, CTE agriculture education programs (Agriculture, Food Innovation, and Natural Resources Career Cluster) were offered at 38 public and charter high schools statewide, with a total program enrollment of 3,357. This number has shown minor fluctuations, from 3,212 students in SY1516 to 3,521 students in SY1617 enrolled in HIDOE CTE agriculture programs.

Future Farmers of America (FFA) is a co-curricular Career and Technical Student Organization that is an integral part of a quality CTE agriculture education program. Established in Hawai'i in 1930, FFA is one of the oldest agricultural education resources in the Islands. FFA participation in Hawai'i has been increasing, from 10 chapters and 126 students in SY1314 to 20 chapters and 416 students in SY1718! Three new chapters have formed during SY1819. Hawai'i 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 Agricultural Experience) is part of the tri-circle CTE agricultural education in natural resources with FFA. Every CTE natural resources student has an opportunity to participate in implementing an SAE project. In addition, an SAE may allow students to earn income based on their individualized project. FFA student members can also use their SAE toward chapter, state, and American FFA degrees offered by the National FFA Organization.

Kahua Pa‘a Mua (Hawai‘i Island)

Youth from Kohala can participate in the Ho‘okahua Ai (to build a foundation of nutrition, sustenance, communication, and sharing) or “HA” Mentorship Program at the Ho‘ea Korean Natural Farming Learning Center. <http://www.kahuapaamua.org>

Kaua‘i Ag Internship Program (Mālama Kaua‘i)

This program, launched in 2015, provides local high school and college agriculture students with paid agricultural internships across Kaua‘i, along with monetary 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

Ōhāhā High School Agriculture Program (The Kohala Center)

The Kohala Center’s Ōhāhā intersession (fall and spring) programs help high school students deepen kinship with the ‘āina and local agriculture through ‘ike that will also help them flourish in life. <http://kohalacenter.org/farmertraining/ohaha>

UH CTAHR

AgDiscovery Summer Enrichment Program

Beginning in 2011, CTAHR, in collaboration with the United States Department of Agriculture, Animal and Plant Health Inspection Service (APHIS), has run the Hawai‘i AgDiscovery Summer Enrichment Program, which targets a diverse population of students interested in agriculture from across the nation and the Pacific region. This two-week summer program provides high school students with the unique opportunity to explore agricultural careers, use innovative and advanced technologies, and network with agricultural professionals. The overall goal of the Hawai‘i AgDiscovery Program is to make available cutting-edge technologies and stimulating learning experiences to encourage students throughout the U.S. and the U.S.-affiliated Pacific Island regions to select an agricultural field as an academic major and future career. More specifically, the project enhances the understanding of educational opportunities available to a wide array of students by creating an added awareness that agriculture can be a high-tech, high-wage profession with opportunities for upward mobility and career advancement.

Gene-ius Day Program (High School)

In the Fall 2017, the Gene-ius Day program opened its first high school class. The goal of this program is to continue creating aspirations in Hawai‘i’s high school students to study science and agriculture and to pursue this passion into college. Students who attend this program develop a strong understanding of basic biology and gain a better grasp of the importance of science and agriculture in everyday life. During the 2018–2019 school year, there are total of 50 students enrolled in the Saturday program. The unique design of this new curriculum does not mimic traditional classroom settings, but rather aims to enhance learning based on (1) a high degree of student involvement, (2) multiple ways of learning and knowing, and (3) sequential phases of cognition. The insights that students gain through the program’s student-driven investigations thus become more relevant and significant to the learner. This investment in the curriculum and learning process leads to the active construction of meaningful knowledge, rather than the passive acquisition of facts transmitted by a lecturer. The student-to-student collaboration that is built into the program reinforces the assimilation of knowledge, while the

teacher-to-student collaboration builds trust for future discovery. Because of this novel approach, students who participate in this new high school program have so much fun that they do not even realize that they are learning new and often complex ideas.

www.ctahr.hawaii.edu/geneius-day

Summer Program - Title I Schools

To increase interest in STEM and agriculture-based subjects among the students of Title I schools (schools that serve low-income families), three years ago, Gene-ius Day launched a summer program to specifically target students from these schools. Students from Title I schools typically feel estranged from higher educational institutions, having had formative experiences that often do not include university graduates. There is frequently a resulting lack of appreciation for the value of higher education in their communities. Providing students with the opportunity to engage in activities on campus that are specifically designed for their edification, the opportunity to interact with mentors with whom they can identify, and exposure to the value of agriculture and STEM education, all the while developing their own communities within the program, is expected to permit the participants in the program to identify positive life experiences with educational opportunities. Ultimately, they will acquire an appreciation for the value of education and the positive role that education and community can play in improving their lives.

In the last three years, in collaboration with the GEAR-UP program, the Gene-ius Day summer program has brought more than 300 students for a series of one-week-long sessions with newly developed Gene-ius Day curricula. Emphasis is placed on showing students the connections between STEM study areas and agriculture, particularly the way that STEM subjects are applied in agricultural disciplines. This goal is accomplished through exciting, tactile activities that stimulate all the senses. This engaging experience motivates students and creates new cohorts of self-directed learners, providing valuable experiential learning in the process.



Photo courtesy CTAHR Gene-ius Day Program

Post-Secondary

Hawai'i Department of Labor and Industrial Relations (DLIR)

Agricultural Training and Education Programs in Hawai'i (October 2012): [Click here for Excel version](#) (Excel, 100 KB) [Click here for PDF version](#) (PDF, 216 KB)

MA'O Organic Farms (O'ahu)

Mala 'Ai 'Opio Community Food Systems Initiative or MA'O was established to recognize the land and youth as Hawai'i's most important assets and to catalyze educational and entrepreneurial opportunities around these assets to address the root causes of cultural, social, economic, and environmental poverty.

MA'O is an acronym for mala (garden), 'ai (food), and 'opio (youth), or "youth food garden," which affirms the belief that when we reconnect and restore the relationship between the land and the people, we are able to return abundance and prosperity to youth, to their families and to the community. www.maoorganicfarms.org

Kauhale Youth Leadership Training (YLT)

YLT is a 2-year farm-to-college program that invests in youth, who are our waiwai, our most valuable asset, and connects them to their community to instill in them a sense of kuleana and responsibility to mālama 'āina, all while earning a college degree and an educational stipend and contributing positively to the local community food system.

University of Hawai'i (UH) West O'ahu Sustainable Community Food Systems (SCFS)

UH West O'ahu's Bachelor of Applied Science with a concentration in Sustainable Community Food Systems (SCFS) prepares students for jobs in the sustainable food and agriculture sector in Hawai'i and beyond. The SCFS Program is a multi-disciplinary, experiential and applied education program about key ecological and social issues in food and agricultural systems. It incorporates problem-based and hands-on learning to develop food system professionals capable of solving real-world problems and transitioning Hawai'i agriculture toward greater ecological sustainability and social equity. SCFS courses are offered in person at the UH West O'ahu campus.

- Trains new generations of food system professionals to think critically and across traditional disciplinary boundaries, bringing a holistic understanding of ecological and social sustainability to solving real-world problems in the food system through work in agriculture, policy-making, planning, business, research and education.
- Systematically engages students in a rigorous scientific analysis of agriculture as a complex socio-ecological system shaped by biophysical, socio-economic, and political factors.
- Trans-disciplinary curriculum helps students to understand the key social and ecological issues in agriculture and the biophysical and social bases of food system sustainability, resilience, and equity.
- Maintains a half-acre student organic garden on campus used for experiential and hands-on learning in ecological horticulture.
- Applies ecological and social theory to understanding and solving real-world problems.
- Involves a diversity of agriculture and food system courses in the natural sciences, social sciences, and humanities, collectively addressing key issues in the agri-food system from a range of disciplinary perspectives while solidifying student academic competences in

analytical reading and writing, oral communication, critical thinking, quantitative and qualitative analysis, and moral reasoning.

- 'Ike Hawai'i: the integration of traditional ecological knowledge and western science in the SCFS curriculum allows for a deeper understanding of indigenous knowledge and culture and their contributions to food-system sustainability, climate change resilience, and social equity.
- Program and course-level learning outcomes for the SCFS program are aligned with UHWO, UH System, state, national, and UN Sustainable Development Goals.
- Emphasizes the application of academic knowledge to civic engagement and social responsibility.
- Selected courses: Environment and Ecology: An Introduction to Environmental Science; Survey of Sustainable Community Food Systems in Hawai'i; Agroecology: The Science of Sustainable Agriculture; Theory and Practice of Sustainable Agriculture; Traditional Agricultural Systems of Hawai'i and the Pacific; A Natural History of Bees and Beekeeping; Food Sovereignty, Nutrition and Human Well Being; Climate Change, Food Security and Resilience; Agriculture, Food and Human Values; Cross-Cultural Environmental Ethics; Senior Farming Systems Practicum; Senior Food System Practicum. SCFS upper-division elective courses in the fields of Indigenous Natural Resource Management, Traditional Ecological Knowledge, Epidemiology, Political Science, and Anthropology are offered by affiliate faculty members in the SCFS program and UHWO faculty, contributing to a truly trans-disciplinary study of food systems and sustainability.
- SCFS research, education, and outreach efforts:
<https://westoahu.hawaii.edu/ekamakanihou/?tag=albie-miles>
- Close community collaborations with MA'O Organic Farms, Kamehameha Schools, The Kōkua Hawai'i Foundation, West O'ahu high schools, Wai'anae Coast Comprehensive Health Center (WCCHC), and many other community-based and national organizations.
- Video statement on applied research and education:
<https://www.youtube.com/watch?v=eMb0nmQxK7Y&feature=youtu.be>
- Recently selected as one of the top 5 sustainable agriculture programs in the nation:
<https://www.hawaii.edu/news/2018/02/12/sustainable-agriculture-programs-among-countrys-top-five/>



Photo courtesy MA'O Farms

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), and 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 agricultural 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 Hawai'i agribusinesses.
- GoFarm (see Workforce section)

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



Photo courtesy CTAHR Student Organic Farm Training Program

Leeward Community College

- Alternative Certification for CTE Licensure Program (CTE Natural Resources Pathway)
- Community Food Security Academic Subject Certificate
- Plant Biology and Tropical Agriculture
 - Associate in Science
 - Academic Subject Certificate
 - Certificate of Achievement
 - Certificate of Competence
 - Certificate of Competence, Aquaponics Technician

UH Maui College – Molokaʻi Educational Center and Molokaʻi 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
 - Turfgrass 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 Hawaiʻi at Mānoa, 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 agriculture 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 Hawaiʻi'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 Hawaiʻi agribusinesses.

Agribusiness Incubator Program

Based at CTAHR, the University of Hawaiʻi's Agribusiness Incubator Program (AIP) helps people who produce, use, or promote agriculture in Hawaiʻi 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

Agricultural Leadership Foundation of Hawai'i (ALFH)

ALFH provides leadership development opportunities for people committed to strengthening agriculture in Hawai'i, including Agricultural Leadership Programs for adults and youth, and the Hawai'i Agriculture Conference. www.agleaderhi.org

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/uhmg

GoFarm Hawai'i

Based at CTAHR, 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, Hawai'i, and Maui. Their mission is to enhance Hawai'i's food security and economy by increasing the number of local agricultural producers. They offer 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 covers 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



Photo courtesy CTAHR GoFarm Kaua'i

Hawai'i Department of Agriculture Farm to School Program and Coordinator

This program and position were established by the Hawai'i State Legislature in 2015 and signed into law by Governor David Ige via Act 218. Statute indicates the following purposes of this program:

- Improve student health;
- Develop an educated agricultural workforce;
- Enrich the local food system through the support and increase of local food procurement for the state's public schools and other institutions;
- Accelerate garden- and farm-based education for the state's public school students; and
- Expand the relationships between public schools and agricultural communities.

Hawai'i Department of Labor and Industrial Relations (DLIR)

- [2013 Hawai'i Agriculture Skill Panel Report](#) (May 2013): 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](#) (December 2011)
- [Soft Skills Survey Results and Analysis](#) (June 2015)

Hawai'i Farmers Union United (HFUU)

HFUU aims to foster the creation of a multitude of diversified smallholder family farms that implement regenerative techniques in growing and raising our food in order to 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. HFUU has active chapters on the islands of Maui, O'ahu, Hawai'i, and Kaua'i; hosts an annual conference/state convention; and runs a Farm Apprentice Mentorship (FAM) Program. 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. www.hfuuhi.org

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://kupuahawaii.org/hycc/>

The Kohala Center

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

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 delivers 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. www.kohalacenter.org/farmertraining

Rural & Cooperative Business Development Services (Statewide)

Services for farmers 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.

www.kohalacenter.org/business

Professional Associations & Groups

Active groups with regular meetings and educational opportunities include the following:

Hawai'i Island: East Hawai'i Cacao Association, Hawai'i Tropical Fruit Growers, Hawai'i Farmers Union United, Hawai'i Farm Bureau, Macadamia Growers Association, Kona Coffee Farmers Association, Hawai'i Coffee Association, One Island Sustainable Living, The Kohala Center, Hāmākua Farmers Cooperative, Hawai'i Papaya Industry Association.

Kaua'i: Hawai'i Farmers Union United, Kaua'i County Farm Bureau, Kaua'i Cattlemen's Association, Kalalea/Anahola Farmers Hui, UH CTAHR Kaua'i Master Gardener Program, Kaua'i Landscape Industry Council, Tropical Fruit Growers Association, Small Business Development Center.

Maui: Hawai'i Farmers Union United, Maui County Farm Bureau, Maui Cattlemen's Association, CTAHR's Maui Master Gardener Program, Maui Landscape Professionals, Tropical Fruit Growers Association, Maui Green and Beautiful.

Moloka'i: 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, Hawai'i Tropical Fruit Growers, 'Āina Pulapula, Master Food Preservers, Kuha'o Business Center (an advocate and vehicle of empowerment for Moloka'i's families to achieve individual and collective financial independence and abundance in the formation of healthy and sustainable businesses).

O'ahu: Hawai'i Farm Bureaus (East/South/West O'ahu), Hawai'i Farmers Union United (Honolulu, North Shore, Wai'anae, Waimānalo), UH CTAHR O'ahu Master Gardeners.