POST-PANDEMIC COLLEGE OF TROPICAL AGRICULTURE AND HUMAN RESOURCES

Introduction

The following are documents supplied by the 6 CTAHR departments (Family and Consumer Sciences; Tropical Plant and Soil Sciences; Plant and Environmental Protection Sciences; Molecular Biosciences and Bioengineering; Human Nutrition, Food and Animal Sciences; Natural Resources and Environmental Management).

The documents are the sole product of the faculty in each department. Departments were asked to consider what are the Grand Challenges for Hawai`i that are related to their disciplines. Therefore, these documents range from the Grand Challenges to direct responses to the ideas provided by campus administration.

This exercise has resulted in a variety of open and healthy discussions among faculty, between departments and among colleges. I expect the college to be stronger for this exercise.

Nicholas Comerford Dean and Director

Department of FAMILY AND CONSUMER SCIENCES

SUMMARY

FCS Responses to UH Suggestions to Dissolve the FCS Department in CTAHR

The Department of Family and Consumer Sciences and our 4 units (FDM, HDFS, CES, and COF) have only begun to assess the UH budget committee's suggestion to eliminate the FCS department in CTAHR, removal of academic units to other colleges and realignment fit with proposed units--that appear to have no budgetary consequences. This summary of the process to date is provided for Dean Comerford's presentation 10-12-20 to UH and UHM leadership. The following is a summary with a caveat that many more discussions must take place before any consensus can be reached. FDM and HDFS has met with Provost Bruno and part of his budget team separately with the academic programs of FDM and HDFS. HDFS and COF has had a preliminary discussion with Dean Conan of CSS. FDM has meet with Deans Roley and Arnade, and will be meeting with the Department of Theatre and Dance. COF has met separately with Dean Konan and SSRI, and CTAHR Dean. The following summary is the unit assessments of information gathered in a few weeks, with many questions yet to be answered. Our data gathering, understanding of proposals, and resulting UH decisions must be made to provide support for impacted faculty, students, and staff so that they can grow and remain successful.

FDM Response

Pros of FDM remaining in CTAHR

FDM can assist CTAHR with development of sustainable Hawai`i branded & <u>value-added</u> <u>textile products</u> to maintain a flexible supply chain from <u>local agricultural resources</u>.

- Alpaca wool from Hawaii farms, Silk fiber from Big Island, Natural locally-sourced textile dyes, Hawaiian essential oil, fragrance for health and consumer products, Hemp fiber product for sustainability
- Vegan leather from the FDM Lab can benefit HI agriculture
- Incorporating digital transformations, technologies (i.e., e-tailing, e-fitting, 3D virtual technology), sustainable fashion
- Create and highlight the impact of local and <u>vertical integration</u> in Hawaii to make the Hawaii fashion industry unique
- Developing strategies, applications of cutting-edge fashion technologies and models to overcome geographic barriers for Pacific Rim small businesses

Cons of FDM leaving CTAHR

- With the loss of FCS, CTAHR will lose 30% of its student share hours and tuition
- CTAHR will lose the annual fashion show, one of its largest annual events
- CTAHR has invested in the program since Dean Comerford's tenure
- Faculty will lose access to NIFA grants and funding; their research and scholarship will therefore be hindered
- CTAHR will lose development of value added agricultural products from FDM
- CTAHR will lose all retailing, merchandising and management benefit from FDM

HDFS Response

Pros of HDFS remaining in CTAHR

- HDFS strengthens CTAHR with a focus on Post-Pandemic <u>health/social welfare</u> dimensions, and aligns with NIFA/USDA's mission. Specifically, twelve HDFS faculty's projects serve Hawaii's community that are consistent with CTAHR's land-grant mission.
- HDFS contributes between 24-28% SSH in the last 5 years, and several HDFS faculty have won national, UH, and CTAHR teaching awards.
- Some HDFS faculty have E time (PDs need to change), partners with 4H on NIFA projects to strengthen families and communities
- HDFS faculty outlined possible contributions to Post-Pandemic grand challenges and strategies that supports CTAHR's mission regarding applied sciences (see HDFS's grand challenges paper)

Pros of HDFS moving to SOC/CSS:

- HDFS faculty have not met with Sociology faculty, so the full potential of possible collaboration, synergy and logistics of disciplinary merger have not yet been explored and discussed
- Move to SOC/CSS will provide easier access to graduate students
- HDFS needs to be separated from FDM, so move to SOC/CSS supports this

COF Response to UH Budget Committee Suggestions and Unit Responses

The proposed reorganization offers a chance to evaluate where we can be best situated to assist Hawai'i's families and create new synergies to enhance this work.

COF supports reorganizing the Center on the Family into the College of Social Sciences, specifically the Social Science Research Institute. We agree with Dean Konan's recommendation that "SSRI may be the ideal home for COF." The UH Budget Committee Suggestions indicate that the discipline of family science should move to CSS, and the Unit Response for both CTAHR and CSS assume that COF will move to CSS. We are a Center with a strong community brand and a 30-year history of serving the children, families, and communities of Hawai'i. Our experience as a Center and our expertise as individual faculty fit within many areas and initiatives of CSS and SSRI. We share interests with the departments of PSY, SOC, PUBA, ECON, and GEO and could become a nexus for multidisciplinary projects on family well-being. COF has done due diligence via deep and thoughtful discussions with FCS faculty, the CTAHR and CSS Deans, SSRI, and the Chair of SOC. COF can thrive and expand in SSRI, better meeting the needs of Hawai'i's families in the post-pandemic era.

Family and Consumer Science (FCS) Cooperative Extension Agent Faculty Response

- FCS Agent faculty must remain in CTAHR and in an academic department.
- FCS Agent faculty must maintain their relationship with Cooperative Extension which is administered by CTAHR.

- FCS Agent faculty fulfill UH Manoa's land-grant mission of Cooperative Extension under USDA's National Institute for Food and Agriculture (NIFA), which is the federal administration agency that oversees three FCS-related divisions.
- Networking that occurs during regular academic department business has contributed to several large grant proposals. Two funded examples since 2015 include USDA/NIFA/CYFAR and are valued close to \$2 million.
- Extension programs conducted by all FCS Agent faculty include programs that relate to agriculture and food systems; agents could fit into other academic departments if the FCS Department is moved to another college(s).
- Maintaining connections with current I/R/S FCS faculty allows for new collaborative projects between faculty such as the current collaborations on internship placements, course assignments, and guest expert lectures.

Human Development and Family Studies Grand Challenges

<u>Mission</u>: **HDFS** mission is to provide a cadre of family service professionals by training students while generating and disseminating prevention-based knowledge that supports healthy individuals across the lifespan, families and communities, particularly for Native Hawaiians and Pacific Islanders.

Vision: Cultivate thriving and resilient individuals, families, and communities locally and globally.

Goals:

- We provide students with personally enriching and strong experiential learning pedagogy that enhances their ability and role as a student, family member, parent, and community member;
- We train future family and consumer sciences educators to serve communities in the state of Hawaii and across the US;
- We generate and disseminate community-informed, evidence-based knowledge across the lifespan, in the context of Hawaiian culture

Pros of HDFS to Stay in CTAHR:

- FCS (Family Sciences) is a strong division of USDA and a high priority USDA program. Our mission is to strengthen families, communities, and the economy by focusing on the human dimensions of food and agriculture. Thus, in the eyes of the federal government it is considered a program related to the mission of agriculture.
- FCS (Family Sciences) program exists within an Agriculture College at land grant universities
- All individuals in the ag industries have or are a part of families, and HDFS provide the expertise to help families at the different stages of the life span from early childhood, adolescence, young adulthood and elders in later years.
- HDFS faculty's current projects align closely with the land-grant mission of CTAHR, and serve Hawaii's community specifically.
 - Sothy Eng leads CTAHR's Food Systems initiative & founded the Home Garden Network program which includes ag clients
 - Sothy Eng is evaluator for NIFA's at-risk youth life skill development funded project which includes ag clients
 - Sothy Eng is external evaluator for FETCH program funded by Hawaii DOH's Alcohol and Drug Abuse Division (ADAD) which includes ag clients
 - Lori Yancura's multistate rural family project & GrandCares project with Heather Greenwood-Junkermeier which includes ag clients
 - Bobbie Yee's Native Hawaiian family and nutrition beliefs and lifestyle practices
 - Rheta Kuwahara's collaborative video with faculty in nutrition (Hawaiian culture based learning) & family garden kit, working with master gardeners which includes ag clients
 - Thao Le's multi-year contract with Hawaii Dept of Human Services/OYS to provide mindfulness training to human service professionals serving at-risk youth & families, and development of curriculum resources for DOE

- Diane Masuo's multi-state collaborative research based on panel data from long-standing family business. Focus on sustainability of families, firms and communities; continuum of resilience and transformative change.
- Diane Masuo's pilot study of sustainability of small family farms on Oahu relative to reciprocal owner and community involvement which includes ag clients
- Michael Cheang & Lynn Yamashita's survey on how Covid-19 is impacting farmers and small businesses will be published in the Journal of Extension
- Michael Cheang & Lynn Yamashita's soft skills for success in the workplace, and collaboration with the Manoa Career Center, and the Hawaii Society of Human Resource Managers to help UH students to be more work ready
- Michael Cheang's children's savings and financial literacy projects, family caregiver education, partnership with AARP, Catholic Charities, Project Dana, and the Hawaii Hongwanji Mission temples
- FCS represents 1/3rd of CTAHR Student Semester Hours and is the largest UG program in the college; so is a large hit to the college teaching program. HDFS program specifically contributes between 24-28% SSH within the last 5 years.
- The college has invested in the HDFS program over the past 3 years (e.g., I2s)
- There is no monetary savings associated with the move. In fact, with the move, CTAHR would lose the SSH that HDFS brings to the college.
- Some HDFS faculty have E (extension, translational research) time, and their projects specifically align with the CTAHR's mission to strengthen families and communities--Sothy, Bobbie, Thao, and Michael. If in CSS, PDs would need to change, and extension work may be valued differently. The extension work that all four HDFS faculty (with Extension time) do are important and valuable community projects... community gardening, mindfulness, financial literacy, family caregiver education, immigrant/minority health.
- COF has "I" time in HDFS Mary, Hua, and Barbara- COF agreement is to provide 2 courses/faculty members which significantly contributes to HDFS teaching load.
- Extension 4H sees us as strengthening what they do, and we are active partners with them. Further, extension supports our internship placement program (some interns are offered full employment after graduation).
- FCS alumni are a significant population, and they are likely attuned/attached to CTAHR (not CSS). Example: One of our alumni is heading the covid response out of the Hawaii Community Foundation

HDFS Grand Challenges

HDFS's grand challenges align with Lassner's **Health & Social Welfare domains.** Specifically, our mission is to promote healthy and thriving individuals, families, and communities in Hawaii by <u>training students</u> and <u>fostering research/dissemination</u> of evidence-based prevention intervention programs.

Lassner's Challenge #1 : Engage more Hawaii residents in post-second educ and training

- Almost a third of HDFS students are Filipinos, Native Hawaiians, and Pacific Islanders
 - 29% (49 of 168 HDFS students total), Fall 2019
 - 25% (46 of 182 HDFS students total), Spring 2020

- HDFS awarded 45% of undergraduate degrees in CTAHR (2019-20)
- 69% of HDFS students are local residents (2019-20)
- HDFS student interns are placed to serve local communities in health, education and wellbeing of families
- HDFS has strong partnerships with over 60 internship sites (non-profit organizations, private and public institutions, state and federal agencies) in communities on Oahu, the neighbor islands, the US mainland, and internationally, who seek out our students because of their comprehensive human development background.
- We aim to increase these indicators by 10% within the next 2-3 years by:
 - \circ $\:$ Increasing articulation with community colleges similar to the one with Windward CC $\:$
 - Providing job opportunities to students to help build work skills via the peer mentoring program
 - Meeting our grand challenge #3 below

Lassner's Challenge #2: Workforce Development for Hawaii

- We prepare students not only for jobs in the workplace, but also for entry into graduate programs. An undergraduate degree in HDFS provides a strong foundation for graduate degrees in public health, early childhood education, nursing and medicine, family law, social work, and public administration.
- We surveyed internship supervisors and employers and the Hawai'i Society of Human Resource Managers (N=116) and used the findings to develop a 3-credit Soft Skills for Success in the Workplace class to help our students to be work ready. This class is open to all students at UH-Manoa. Plans are in place to collaborate with SHRM Hawaii Board on workforce development.
- CTAHR's 2018-19 survey of HDFS alumni (N=50) showed that 94% of the respondents reported feeling prepared for their careers. Word Cloud analysis showed that Communication and Management Skills were at the top of all the words mentioned. One participant noted, "I learned about how to create a resume and present myself in the workforce. I also learned a lot about effective time and money management. Most importantly for me, I have learned how to work well in environments that require efforts from multiple people to achieve one goal, and how to socialize well with others in a professional manner."
- The national average for HDFS B.S. is \$57, 029 (payscale.com). Hawaii is about 15K less. We award 45% of the undergraduate degrees in CTAHR, with 4 years as the median time to degree in 2019-2020 (Miro Data).
- Graduates enter the HI workforce in careers that promote prevention/intervention and reduce costs associated with family violence, poor budget management, etc. (e.g., human services, education, health, community development as early childhood educators, program staff in non-profit agencies in human services).
- Successful alumni of HDFS include:
 - o Sheri Daniels, Executive Director, Papa O Lokahi
 - Danny Goya, Partners in Development, Traveling Preschool for Homeless
 - O Lisa Kitagawa, HI House District 48, Legislature,
 - Vanessa Chong, ACLU Executive Director ACLU (retired)

- Virginia Ogata, KCC, Student Success Coordinator
- o Diane Terada, Senior Programs Director, Catholic Charities
- Encourage our internship sites/partners, alumni to participate in CTAHR Career Launch

Challenge #3: Increase enrollment in HDFS & graduates of HDFS majors

- We will explore innovative transdisciplinary courses and pedagogical strategies to increase student enrollment in HDFS
 - Make classes bigger while maintaining good pedagogical practices
 - Expand courses such as HDFS 380 (Research Methods) that can serve other departments in CTAHR
 - Provide workforce development modules that can serve other departments in CTAHR and other colleges (e.g., soft skills class; allied health professionals; financial planning). These will be skill-based courses in addition to theoretical, conceptual courses to help increase employability. An example of a class that is already being offered to all UH-Manoa students is the 3 credit (HDFS 365) class, "Soft Skills for Success in the Workplace" to help students to be work ready.
 - Provide an introductory mental health & wellbeing course Manoa wide (similar to the very popular Yale's Happiness Course). This would address stress/anxiety among college students. This course could be 1-credit Mindfulness Skillful Living.
 - Adapt our curriculum to address the needs and challenges of current students
 - Example graduated internship
 - Incorporate service learning & civic engagement, and partner with other departments interested in civic engagement
 - Currently, all HDFS courses fulfill the diversify requirement for Social Work students.
 - NREM will be listing 7 of our courses (research methodology, mindfulness & skillful living, community needs and resources, consumer economics, etc.) for students who are on their social science pathway.
 - Rick Caulfield has the largest courses taught in our program with up to 300 students in two sections of HDFS 230 each semester. This is a required course for Pre-nursing, KRS, and Elementary Education students and participates in UHM's learning communities for 1st-year students such as Access to College Excellence (ACE) and College Opportunities Program (COP) each year.
 - HDFS faculty wins teaching awards (e.g., Rich Caulfield is the only faculty on campus with all three Excellence in Teaching awards; Lori Yancura and Michael Cheang have both received CTAHR and UH Teaching Awards).
- Restructure course offerings to promote cost-savings
 - Offer less sections of courses and higher enrollment to reduce the need for teaching faculty and lecturers.
- Consider offering a minor or certificate for PSY, SOC, ED, NUR, PUB, SWK. Native Hawaiian programs are looking for PD/certificate for their FCIL, job training, home visiting staff.

- Enhance our marketing through multimedia and social media formats such as video promotion, program posters, program handouts, Facebook, Instagram, and YouTube.
- Participate in national professional association networks to recruit prospective students.

Challenge #4: Increase Family & Community Wellbeing, in Response to Pandemic

- Family well-being is vital to thriving communities. Families who are able to make informed decisions, manage their basic needs, and tackle pressing human and community issues are better equipped to lead happy, healthy lives. HDFS trains students to meet these challenges. We will innovate and provide teaching modules to our community as well.
- HDFS faculty regularly conduct community workshops on mindfulness, family caregiver education and financial literacy workshops.
- Family well-being is vital to thriving communities and especially farm families who are at risk for social-psychological problems. Challenges of farm families include high suicide (<u>Peterson</u> et al. 2018), opioid misuse and addiction. Diane Masuo's research projects & Lori Yancura's multistate rural project are addressing these challenges.
- Package some of our teaching modules and bring it to the community partner up with communities, health/social service organizations that are serving at-risk families/communities
 - Provide modules in family resources, family finances, elder care, parenting, athome food sources,
- Offer certificates (Family Development) in Outreach College for working adults, online
 - o Early childhood family educator
 - o Gerontology
 - o Certified Family Life Educator (CFLE) certified by NCFR
 - o Family Life Skills
 - Budgeting and Money Management or Family Resource Manager
 - Marriage & Family Enrichment educator
 - Grant proposal writer (assisting community orgs with grant identification and acquisition)
 - o Divorce Mediator
 - Case Manager
 - First Aid Family Kit family healthline, prevention & primary prevention
 - Offer credit and non-credit
- Expand Professional Development (PD) opportunities for teachers and social workers
 - Mindfulness & effective behavioral modification (Thao Le currently already offers PD to teachers, and will expand to to reach social workers)
 - Our classes HDFS 331 & HDFS332 are mandatory for teacher's education. Look into expanding other offerings
- HDFS faculty continue to partner and expand current research/extension projects, and find opportunities to engage in transdisciplinary projects with NREM, HNFAS, Social Work, COE

<u>Challenge #5: FTE needed to meet the current demand today (data driven need), and to meet a</u> <u>predicted demand in the future</u>

- Investment in HDFS FTE is needed to meet social welfare demands, both in response to pandemic situations as well as to sociodemographic changes in Hawaii & globally. Expertise areas needed: healthy marriages and family, mental health & resiliency, parenting and resilient pre-K to elementary aged children
- HDFS contributed to 27% (2018-2019) and 24% (2019-2020) of SSH in CTAHR (Miro Data). Our SSH per faculty is the highest in CTAHR.
- At least 1/3rd of graduates go on to seek graduate degrees (MFT) at other universities (Chaminade University); thus, we need a professional MFT program which would require at least 2 FTEs with MFT/counseling credentials.
- Healthy Marriages & Family Needs: Families struggle with work-family balance, caregiving and caretaking, and the added stress of work and learning at home is creating additional stress and challenges. Domestic violence, parental conflict are rising dramatically due to the pandemic. FTE in the area of healthy marriages and family is needed to address the impact of the pandemic on family wellbeing.
- Early Childhood and Pre-K to Elementary School Age Children: Although we are currently living with the pandemic of Covid-19, we are learning more about the effects of living with this virus has caused children. The undetermined short-term and long-term effects of living under this prolonged stress shows a growing need for educated and skilled HDFS graduates to help families and children in the community to meet the emerging needs of this generation.
- Mental health & Resiliency Needs: Medical and social science experts are warning that the reported high levels of emotional distress from the covid pandemic is leading to a national mental health crisis. HDFS faculty is currently providing mindfulness training to K-12 teachers, human & social service, but more FTE in HDFS is needed to meet this growing societal challenge.
- Gerontology: More than 5 million Americans have Alzheimer's disease in 2020, projected to reach 13.8 million by 2050 (Alzheimer's Association). HDFS faculty are currently providing family caregiver education workshops for UH System employees who care for their elders with dementia.
- Family Financial Management: A substantial number of adults were financially vulnerable at the time of the survey and either could not pay their current month's bills in full or would have struggled to do so if faced with an emergency expense as small as \$400. Even fewer had three months of emergency savings to cover expenses in the event of a job loss. One-fourth of non-retirees indicated that they have no retirement savings (Federal Reserve, 2020). HDFS faculty is partnering with local credit unions to start savings accounts for children from resource limited families/communities, and to provide financial literacy workshops for parents.

Challenge #6: Improve philanthropic performance, alumni outreach

- Develop our own internal database to track and follow-up with our alumni. Ask the UH Foundation (Audrey Hirayama) about best practices.
- Explore potential with alumni for an endowed chair position

Challenge #7: Strengthen the Family & Community Focus

- HDFS and FDM faculty's research and teaching interest and focus are dissimilar, disparate, and separate.
- HDFS sees alignment with COF & CES, but not with FDM. We recommend separation from FDM (separation from old-fashioned, somewhat pejorative association with 'home ec.')

Pros of HDFS to Move to Sociology/CSS:

- HDFS faculty would have easier access to graduate students who are trained in an allied discipline for research grants and teaching assistance
- Collaboration with colleagues in CSS who share similar research interests in families, aging, API populations in Asia (and in Hawaii); this will result in efficiencies of clerical staff to assist in communication with grant agencies
- HDFS shares SOC department passion for social justice issues
- More tenured faculty in the department to share the service load for department, college, and university level activities
- Opportunity to create an applied degree track within SOC for students desiring national CFLE certification or to pursue concrete employment opportunities
- Resources of CSS more in line with research and applications for humans (for example: CSS has a college-wide qualtrics license that would eliminate need for costly individual licenses and allow department to state or the art survey technology (including analysis)
- CSS grant support and fiscal units would be more familiar with the grant mechanisms for working with human social science than ag/bio
- As faculty in the University of Hawaii Land Grant Institution, faculty would maintain access to many NIFA resources
- Family sociology is an area within SOC. Family sociologists typically examine social structures and contexts that impact families-divorce, marriages, and NOT interaction of family members and impact on their quality of life; however, SOC students may likely have applied and prevention interests too.
- If a physical move is required, Sanders is a much newer building than Miller and has more professional space
- A combined department of Sociology and HDFS would be among the largest in the University, thus provide more robust protection from potential department eliminations
- New, combined, department will have a relatively narrower focus and thus a more streamlined use of resources
- College administration will have a better understanding of the needs and outcomes of science and outreach of human populations
- Applied research to serve the people of hawaii is still an important part of the University Mission and will be welcome at CSS

Fashion Design and Merchandising (FDM)

The FDM program offers fields of studies that focus on enhancing the lives of individuals, families, consumers, and communities. FDM graduates are prepared to work in specialized fields related to each area of study where they are able to use the knowledge and skills they learn in FCS/FDM to address societal issues to promote the well-being of individuals, families, consumers, and communities. Whether focused on sustainable clothing and upcycling, textile/clothing manufacturing and design, merchandising in the near environment, and/or e-commerce, graduates are prepared to meet the challenges of Hawaii's fashion business environment.

The FDM faculty provides students the individual attention in and out of the classroom to promote learning, scholarship, and development. FDM students are encouraged to take advantage of opportunities through internships, field study, study-abroad, independent study, and/or participation in student organizations to foster academic growth and development.

Vision: To be a leader in fashion and retail education in the Pacific Rim region.

Values: The FDM faculty value sustainable measures, diverse perspectives, creative solutions, critical thinking, and Hawaii as a place of learning.

The mission and the purpose of the instruction program in FDM is to provide students with appropriate knowledge and skills for career positions in apparel and fashion-related industries; to promote understanding of the effects of sustainability, social, cultural, economic, and political issues on global and local apparel and fashion-related industries and on modes of dress; to foster appreciation of the role of dress and appearance as these reflect and shape individual behavior, social and economic exchange, and cultural conditions; to nurture intellectual growth and creativity, and to support the mission of the College of Tropical Agriculture & Human Resources by fostering student acquisition of problem-solving, analytic, and communication skills.

5-Year Goals and Plan (2021-2025):

- 1. Goal 1: Emphasize digital transformations and fashion technologies (i.e., e-tailing, efitting, 3D technology in virtual reality) for sustainability to meet Hawaii's needs in the curriculum.
 - a. 2021: Evaluate and assess the current curriculum to identify areas of weaknesses
 - b. 2022: Update course content as appropriate
 - c. 2023: Begin data collection to assess impact of changes
 - d. 2024: Continue data collection to assess impact of changes
 - e. 2025: Evaluate data to assess impact of changes
- 2. **Goal 2**: Incorporate updated fashion technologies in the curriculum for preparing more Hawaii residents to fill the jobs Hawaii needs.
 - a. 2021: Assess impact of job changes after economic challenge
 - b. 2022: Evaluate and assess the current curriculum to job marketing
 - c. 2023: Update course content and technologies as appropriate current job changes

- d. 2024: Improve applications of technologies to meet the needs of Hawaii fashion industry
- e. 2025: Transfer applications skills to increase Hawaii residents for job market
- 3. Goal 3: Conduct research on the needs of the Hawaii industry and sustainable fashion.
 - a. 2021: Develop research project to assess needs of the Hawaii fashion industry
 - b. 2022: Collect data
 - c. 2023: Analyze data
 - d. 2024: Write up data and summarize findings
 - e. 2025: Disseminate and make recommendations to meet the needs of the Hawaii fashion industry

4. **Goal 4:** *Revise FDM curriculum to address economic sectors and develop new approaches to old ones and global challenges the Hawaii fashion industry is facing.*

- a. 2021: Access current FDM curriculum strength and weakness of economic sectors
- b. 2022: Revise as appropriate FDM curriculum to address recent changes to the Hawaii and global fashion industry of economic performance and importance of local and flexible supply chain management
- c. 2023: Apply pedagogy to improve and strengthen FDM curriculum in regards to economic sectors
- d. 2024: Evaluate the pedagogy applied to the FDM curriculum to meet economic needs
- e. 2025: Examine the effectiveness of the FDM curriculum on student learning outcomes
- 5. Goal 5: Increase student enrollment by 50%.
 - a. 2021: Implement better recruitment strategies by visiting 10 high schools career days annually
 - b. 2022: Create a series of 3 open houses (fashion camp) for high school students to visit annually
 - c. 2023: Continue open house (fashion camp+) and invite high school students and FDM alumni to participate in annual fashion show
 - d. 2024: Continue open house (fashion camp++) for AA degree students. Finalize the MOU with HCC
 - e. 2025: Create FDM day to promote both design and merchandising students' achievements

FDM's Continued Contributions to the Hawaii Fashion Industry:

- 1. Training many fashion business employees for the Hawaii fashion industry: visual merchandisers, retail merchandisers, buyers, managers, assistant managers, brand ambassadors, product developers, public relations, product developers, event planners, creative managers, fashion stylists, brand managers, and creative directors.
- 2. Preservation of Hawaiian cultural and historical clothing designs to pass down to future generations. (i.e., Aloha shirt, muumuu, and holoku studies and publications).

3. Develop and create a bridge of new skills and knowledge to the Hawaii fashion industry. (i.e., 2D/3D digital pattern maker, B2B, B2C).

Changes to the Local Fashion Industry:

The pandemic will accelerate the shift in business from traditional brick-and-mortar stores to etailing (https://www.cnbc.com/2020/07/27/the-future-of-retail-amid-covid-19.html). The operation and strategies of fashion business will evolve into different formats such as ecommerce and relying on local business and sustainability. The fashion and retail worlds will not disappear after the pandemic, but will see change. The manner in which people procure and purchase items will change dramatically to online merchandising, sales, and services. These changes will impact businesses to:

- 1. Focus on e-tailing.
- 2. Rebrand their identities.
- 3. Develop new sourcing, merchandising, marketing, and selling skills, including virtual fitting rooms.
- 4. Create an advisory board to create partnerships with local fashion business professionals in order to prepare our students with the skills to employ effective strategies to meet the challenges our fashion industry is faced with.

Focus on Sustainable Hawaii:

The pandemic has forced the industry to reconnect with current outsourcing policies that leave the local industry in danger during critical times. The local fashion industry will need to develop products that (1) promote sustainability and (2) are unique to Hawaii. These measures include:

- 1. Focusing on local specialty products (e.g., fibers, dyes, fragrances) to provide innovative business operations and strategies with cutting edge technologies (i.e., e-tailing, e-fitting, co-design).
- 1. Focusing on using recycled textiles in the development of new products.
- 2. Developing new sustainable fashion business strategies and operations that pull from the local communities and resources.

Meeting COVID-19 Challenges:

During the pandemic, the FDM faculty are committed to providing essential skills for students and the community through:

1. Developing mask patterns and instructions to share with the community available in the FCS/FDM website and YouTube.

a. Providing basic training skills on mask's construction in FDM 205 or through collaborations with Stole Society, one of FDM's student organizations.

b. Evaluating the quality and effectiveness of masks (in FDM 221, Fall 2020) to train current UH and FDM students to gain updated knowledge of understanding effective quality of

cloth and medical masks, and to prepare FDM and UH students with updated knowledge to develop and enhance their skills.

FDM Revised Curriculum:

FDM is prepared to revise its curriculum in order to meet the new challenges by evaluating and updating its program. Courses that specifically address these issues are:

FDM 101: Introduction to the Fashion Industry provides an overview of the history and current state of the global and local industry, including the retail apocalypse and business models for navigating challenges, as well as developing communication skills for professionals.

FDM 205: Basic Apparel Construction helps students understand the principles of quality clothing and construction. Students are able to develop their knowledge of various practical seam finishing and create different garments (shorts, masks, tank tops skirts, and aloha shirts) throughout the semester using proper machines techniques. This course will appeal to both design and merchandising students who want to pursue further study in FDM.

FDM 215: Block Pattern Design covers a fundamental pattern drafting method, which gives students to learn pattern manipulation through product development. Students are able to enhance their knowledge of garment fit using live models.

FDM 301: Fashion Forecasting and Marketing guides students to analyze trends, develop longterm forecasting, and understand competitive analysis and digital marketing concepts. This course will also appeal to students in CTAHR who need to understand and predict consumer trends and seek to open their own retail operations.

FDM 316: Advance Speciality Design provides students the opportunity to learn advanced study in the specialty market design, pattern making, and apparel construction Different specialty designs (swimwear, menswear, sustainability in design, knitwear, couture, Hawaiian dye creation, non-waste, or others) will be offered every semester or year alternatively. Students are able to develop their original design in the specialty design market utilizing the flat pattern making, draping, and current industry specific construction methods and machinery.

FDM 338: 2D/3D CAD guides students to create 3D virtual samples prior to construction of a physical prototype. Accurate 3D simulations enhance business workflow efficiency and cost efficiency. Also, this course helps students develop diverse graphic designs and sell these designed t-shirts, mug, and office supplies to e-consumers via a website. This course will appeal to students in CTAHR who need any customized designs to promote and advertise agricultural products, plants, and Hawaii-based local products.

FDM 339: 3D Retail Store Design gives the student the opportunity to develop 3D visualizations of retail store environments and 3D virtual tours using 3D modeling technology in virtual reality. It can be used to develop an interactive website. This course will appeal to students in CTAHR

who seek to open an online store or promotion website related to agricultural products, plants, and Hawaii-based local products.

FDM 371: Retail Buying and Merchandising helps students understand the principles and practices underlying the retail industry. This course will also appeal to students in CTAHR who seek to open their own retail operations, whether it be clothing, plants, or nutritional supplements.

FDM 375: Merchandise Planning and Control gives the student the opportunity to define how resources are generated, managed, and expended. Students are able to demonstrate appropriate procedures and techniques relating to financial planning and control of merchandise inventories. This course will appeal to students in CTAHR who seek to open their own retail operations, whether it be clothing, plants, and nutritional supplements.

FDM 411: Body scanning using mobile devices and fitting simulation can appeal to nutrition students who are studying health care and body shape study. 3D body scanning can also appeal to students in CTAHR who seek to open their own retail operations.

FDM 419: Apparel Design Studio focuses on creative design processes to expand design boundaries through in-depth design development. This course provides students the opportunity to develop their own collection through the process of inspirational research and their learned knowledge (forecasting, sketching, draping, pattern making, draping, 2D/3D CAD and design, muslin proofs, fitting, garment construction).

FDM 437: Small Business Start-up guides students to develop e-retail, related business plans, and cost analysis to secure bank loans. It will also appeal to students in CTAHR who seek to open their own retail operations, whether it be clothing, plants, or nutritional supplements.

FDM 471: Appeal to students interested in international trade who want to sell their products in the global market and to learn trade policy and regulation.

FDM 491: Branding focuses on a comprehensive overview of strategic brand management including functional-level, corporate-level, and business-level strategic directions in omnichannel retailing and e-tailing. This course will appeal to students in CTAHR who manage their own businesses related to agricultural products, plants, nutritional supplements, and Hawaii-based local products.

FDM 492: FDM students will be prepared with necessary soft skills and on-hand experience when entering the workforce.

FDM 495: FDM students will employ critical thinking skills when addressing complex issues in the workplace.

Center on the Family

Looking Toward the Future

The Center on the Family (COF) was established by legislative mandate (SCR 82, 1989) to be the key source of research and information on the well-being of Hawai'i's families. COF is a vibrant unit that brings translational research to community partnerships.

COF addresses the well-being of people in Hawai'i as described in the University's recent call to action: "We serve Hawai'i best...when our *scholarship addresses critical challenges and opportunities, and when our service advances the communities in which we are embedded*" (Provost Bruno, September 11, 2020). COF also plays a role in meeting President Lassner's post-pandemic imperative to *strengthen the UH research enterprise* as a major economic and intellectual driver.

- COF's content areas are highly relevant to President Lassner's focus on health, Hawai'i and its people.
- COF furthers the UH Land Grant mission by studying community problems and recommending solutions to government agencies, legislators, and community organizations that serve Hawai'i's families and communities.
- COF contributes to the state economy by bringing in extramural funding. Since its inception in 1991, COF has received over \$37 million in external grants and contracts. For 2020 alone, this figure is \$2.7 million.

Hawai'i's families are increasingly challenged in a post-pandemic society. Hawai'i's families face a constrained economy and a high cost of living. Low-income households took nearly a decade to recover from the great recession and the COVID recovery is expected to take even longer. COVID has also underscored the importance of social determinants of health and the vulnerabilities that stem from systemic inequities. Even pre-pandemic, Hawai'i families often struggled to achieve a healthy work-family balance. In this new world of working and learning at home, families will need to negotiate new ways of coping. Families promote emotional well-being and resilience in their members through nurturing relationships, strong communication, mutual support, and quality family time—families may need help maintaining their internal strengths in times of stress.

How COF Supports Hawai'i's Families and Communities

COF has been nimble in responding to emerging social issues and will continue to do so. Our grand challenge is to apply our skills as researchers, evaluators, and extension educators to help families and communities remain healthy and resilient as the COVID pandemic exacerbates existing stressors and inequities.

- We address a range of social issues including family economic well-being, homelessness, equitable access to early childhood education and care, prevention of child maltreatment, healthy aging, and substance abuse. We work closely with state agencies and community organizations that directly serve children, families, and older adults. Our partners include the Department of Human Services, the Department of Health, and numerous nonprofit human service agencies, community coalitions, and advocacy groups.
- COF provides original research, evaluation services, data, and training/technical assistance. Examples of *research and evaluation* work include peer-reviewed journal articles on child and

family development, a study of street youth, evaluating innovative services to prevent child abuse and the unnecessary placement of children into foster care, monitoring outcomes of young people transitioning out of foster care, a statewide needs assessment of early learning programs, mapping COVID-related changes in community childcare resources, and identifying employment sectors vulnerable to COVID-related job loss. *Data focused* projects include a signature set of Community Profiles, community training to build a data-driven statewide underage drinking prevention program, reports on substance abuse treatment and outcomes, ten years of annual reports on homeless services use, briefs on older adults and their families, and tracking the well-being of Hawai'i's children and their families through the Hawai'i KIDS COUNT social indicator project.

• Our work aligns with UH's goal of helping government officials and legislative bodies by informing program planning, service delivery, and public policy. *Policy-related outcomes* of our partnerships include the passage of a state Earned Income Tax Credit, changes to foster care administrative rules, a bill to establish universal preK, and the expansion of long-term care services for kūpuna to support working family caregivers. *Program-related changes* include more effective social work practices to prevent child abuse and strengthen families, a voluntary foster care program to age 21, a statewide integrated database for substance abuse and prevention services, and teacher coaching in Head Start classrooms.

Response to UH Budget Committee Suggestions and Unit Responses

The proposed reorganization offers a chance to evaluate where the Center on the Family can be best situated to assist Hawai'i's families and create new synergies to enhance this work.

- The UH Budget Committee Suggestions mentions in the recommendations to the College of Tropical Agriculture and Human Resources (CTAHR) that the degree program in Human Development and Family Studies (HDFS) move to the College of Social Sciences (CSS), but that CTAHR will "need to address... the Center on the Family." The CTAHR Unit Response indicates that CTAHR "assumes that COF will go to CSS with HDFS." The CSS Unit Response recommends "reorganizing FCS and COF into the College of Social Sciences... and SSRI may be the ideal home for COF." Both college responses assume that COF will move to CSS.
- In the development of our response, we have done our due diligence. We have met with the deans of both colleges and had productive and detailed conversations about how COF would fit into the vision of each college going forward. We have had multiple conversations with our colleagues in the Department of Family and Consumer Sciences, weighing the pros and cons of membership in each college. We have had conversations with the chair of the Department of Sociology and the interim director of the Social Sciences Research Institute. These have been thoughtful, candid discussions, and we feel we have gathered a comprehensive view of our fit with the objectives and resources of these colleges and units in moving forward to meet the post-pandemic challenges for Hawai'i.
- <u>We support reorganizing the Center on the Family into the College of Social Sciences, specifically</u> <u>the Social Science Research Institute.</u> We are a Center with a strong identity in the community and a history of nearly 30 years serving the children, families, and communities of Hawai'i through extension and research. We agree with Dean Konan that our experience as a Center and our expertise as individual faculty fit within many areas and initiatives of CSS and SSRI. We share interests with the departments of psychology, sociology, public policy, economics, and geography and could become a nexus for multidisciplinary projects on family well-being. Our collective and individual efforts can thrive and expand in SSRI, to continue to meet the needs of Hawai'i's families.

Family and Consumer Science (FCS) Extension Agent faculty

<u>USDA's NIFA Human Sciences Program Mission:</u> Focus on promoting community vitality, strengthening individual and family well-being, and supporting 4-H and positive youth development

<u>CTAHR's Cooperative Extension Mission</u>: Extend practical applications of science to support local food systems, healthy living, youth development, and the stewardship of natural resources for future generations.

<u>FCS Department Mission</u>: Contribute to developing resilient families, businesses, and communities. We seek to serve as a catalyst for long-term family, community, and policy changes that strengthen and promote our stakeholders, and to improve their quality of life through our research/scholarship, instruction, and extension service throughout Hawai'i and the Pacific Basin.

<u>FCS Agent Faculty Responsibility:</u> Address community needs through a research-based educational process aimed at improving the quality of life for individuals and families.

Pros of FCS Extension Agent faculty remaining within CTAHR

- 1. FCS Extension programs are directly related to the following divisions in USDA's National Institute for Food and Agriculture:
 - a. Division of Community and Education
 - b. Division of Family and Consumer Sciences
 - c. Division of Youth and 4-H
- 2. FCS Agent faculty bring together the missions of FCS Department, CTAHR Cooperative Extension, and NIFA: Improve the quality of life for families, communities, and agricultural stakeholders through an educational process utilizing science-based information and resources.
- 3. All individuals in the ag industries have or are a part of families. FCS Extension Agent faculty provide educational programs that are focused on improving the quality of life for farm and non-farm families across the life span.
- 4. FCS Agent faculty deliver educational programs related to agriculture economic sustainability.
- 5. FCS-Agent faculty are/have been PI or co-PI on recently funded projects that align with the land-grant mission of CTAHR.
 - a. USDA/NIFA/CYFAR-GRANDcares
 - b. USDA/NIFA/CYFAR-Creating a Village
 - c. Maui County Office of Economic Development
 - d. Hawaii County Research & Development
 - e. Hawaii Department of Labor Industrial Relations, Workforce Development (HDLIR)
 - f. Whole Foods Bee Cause
 - g. Maui Maker Space
 - h. Hawaii 4-H Foundation Weinberg grant
 - i. Office of Juvenile Justice and Delinquency Prevention
- 6. CTAHR has invested in the FCS Extension over the past three years through the hire of four Extension faculty: one Assistant Extension Agent, two Junior Extension Agents, and one .5FTE Extension Specialist.
- 7. All 4-H/Youth Development and Intergenerational FCS Agent faculty currently include programs that relate to agriculture and food systems.
- 8. Current FCS-Agent faculty support CTAHR students through internship opportunities.

FCS Extension Agent Faculty: Grand Challenges

FCS Extension Agent faculty develop, implement, and evaluate educational programs that address community needs and contribute to healthy and resilient individuals, families, and communities in Hawaii. This is supported through acquisition of external and internal grants.

Challenge #1: Engage more Hawaii residents in post-secondary education

FCS Extension Agent faculty currently deliver the following programs which reach vulnerable K-12 populations for whom higher education can make the greatest difference.

- Family, Career, and Community Leaders of America (FCCLA). Students participate in school and community based programs around topics within the field of FCS.
- Diversity in Agriculture Program. Exposes youth to agriculture and careers in agriculture through a variety of lenses including technology, science, business, culture, and arts in addition to hands-on learning and agriculture practice. The goal is to entice youth to pursue farming and agriculture careers to sustain agriculture in Hawaii.
- Virtual Reality Agriculture Career Pathways. Week-long program held during school breaks and utilizing virtual reality tours with education on agriculture career pathways such as soil science, plant science, food science, animal science and ethnobotany.
- 4-H Positive Youth Development Programs. After-school educational programs at Title 1 schools, homeless shelters, and immigrant community settings. Many programs include a workforce development and career education component.
- USDA/NIFA/Children Youth and Families At-Risk Programs. Targeted educational interventions that build resilience in at-risk youth and their families.
 - GRANDcares. An educational intervention for grandfamilies aimed at increasing parenting skills, self-care practices, self-efficacy, and leadership skills in grandparents and the grandchildren they are raising.
 - Creating a Village. An educational intervention aimed at preparing at-risk intermediate school students for adulthood utilizing youth-adult partnerships, teen mentoring, and life skill development. Lessons include applying to college and choosing a career path.
- Science and Math of the Kitchen. Afterschool and summer educational program for intermediate and high school students that promote the exploration of STEM through everyday experiences. This program is currently offered through Upward Bound to future UH system students.
- CTAHR Promotion. Undergraduate program and career pathways are highlighted at FCS Agent faculty community-based informational events.

Challenge #2: Prepare more Hawaii residents for the jobs Hawaii needs

FCS Agent faculty currently work with the following programs which contribute to

- Internship preceptorships. Faculty serve as preceptors for student interns in CTAHR's HDFS program, School of Public Health's MPH program, and UH Maui College's Human Services program.
- DLIR Workforce grants. Faculty implement skills-based educational programs in areas related to agriculture, technology, and entrepreneurship.
- OJJDP grant. A multi-year collaboration between 4-H and the CTAHR Academic and Student Affairs Office. The Grow with Us Mentoring Program helps high school students develop their readiness for college and careers, explore STEM and agricultural fields, and get hands-on experience in the community.

- College of Education. Recruitment of pre-service teachers to gain experience with informal educational programs as 4-H Youth Development volunteers partnership is in development.
- 4-H Youth Development. Programs that prepare K-12 youth to develop leadership, critical thinking, and public speaking skills necessary in college and career settings.
- Creating a Village. Work experience opportunities for teens that mentor at-risk intermediate age students as they learn and practice life skills necessary for transition into adulthood.

Challenge #3: Seed new economic sectors and develop new approaches to old ones.

FCS Extension Agent faculty seek and manage external grants which fund projects that benefit individual program participants as well as provide economic benefits to their communities.

- Google CS Pathway
- Virtual Reality
- AGduino
- STEM Challenges
- 'Ohana Garden & Grindz. Many of Hawaii's rural families live in food deserts and as a result are more likely to experience food insecurity than non-rural families. This educational program involves the entire household in learning and practicing gardening skills, growing produce to supplement their diet, and prepare the garden produce in ways that contribute to health. This educational process also contributes to food security and sustainable living.
- GET Local video contest
- 4-H Environmental science
- Agriculture Business Succession Planning. Many of Hawaii's current agriculture business owners are nearing retirement without a specific plan for passing on their ag business. This project introduces the business owners to the concepts and the professionals necessary for a successful succession plan. Many of these plans involve either passing the business to younger family members or developing a strategy for identifying non-family members interested in entering the agriculture field.
- GET Local Health Food Systems Initiative.
- Communications fair (esports)

Challenge #4: Strengthen the UH Research Enterprise as a major economic and intellectual driver.

FCS Extension Agent faculty are housed throughout the state and work closely with community partners to identify community needs that can be addressed through educational intervention. Since 2015, agent faculty have been successful in developing community-based applied research projects. Those who benefit from the projects include the participants, grant-funded staff, Hawaii's communities, and the FCS field including academics and practitioners. The following are a few examples of grant proposals and implemented projects in which FCS Agent faculty are PI, co-PI, or Key Personnel.

- USDA/NIFA/Children, Youth, and Families At-Risk. This 5-year funding mechanism provides educational interventions aimed at developing resilience among the vulnerable populations in the state. Since 2015, two 5-year projects have been funded in the state of Hawaii. (approximately \$2 million)
- USDA/NIFA/Special Needs. A competitive grant program for state Extension services at 1862 Land-Grant Institutions to support innovative, education-based approaches to provide cooperative agricultural extension work. In 2016, Hawaii was part of an initial pilot program for a national youth-based disaster

preparedness education program, which is currently implemented through the Hawaii 4-H program throughout the state. (approximately \$110,000)

- USDA/NIFA/Agriculture and Food Research Initiative. This multi-year (varies by grant) awards research, education, and extension grants to improve rural economies, increase food production, stimulate the bioeconomy, mitigate impacts of climate variability, address water availability issues, ensure food safety and security, enhance human nutrition, and train the next generation of the agricultural workforce. Since 2015, two multi-state proposals have been submitted and are currently pending. (approximately \$2.1 million)
- USDA/NIFA/Rural Health and Safety Education Grant. This 2-year funding mechanism focuses on decreasing some of the health and safety disparities experienced by rural families. CTAHR teams have submitted project proposals in recent years which have not been funded. Using reviewer feedback from these unsuccessful proposals, a team in CTAHR is developing a project proposal for the 2021 funding cycle which will focus on improving food security and food access for Hawaii's rural communities. (\$25,000)
- USDA/IAEFP Grant. This 2-year grant provides funding for fellowships to eligible U.S. citizens to assist developing countries in establishing school-based agricultural education and youth extension programs. In 2020, a collaboration between Extension, Instruction, and Research faculty in multiple departments within CTAHR submitted a proposal, which was not funded. The team intends to revise and submit the proposal next year. (\$500,000)
- U.S. National Oceanic and Atmospheric Agency/Environmental Literacy Grant. The program offers grants for programs that educate and inspire people to use Earth system science to improve ecosystem stewardship and increase resilience to environmental hazards. Two proposals have been submitted under this program to deliver educational programs in the community. One was not funded and one is currently pending. (\$506,000)
- Aquaculture for K-12/NOAA Grant. The Center for Tropical and Subtropical Aquaculture (CTSA) received a 2-year grant. The goals of this project and expected impact include: increased aquaculture and fisheries literacy for teachers, students, and their families, as well as the general public in Hawaii; the perpetuation of multiple skills in line with goals for aquaculture workforce development; and improved human nutrition. Through effective integration of education and outreach efforts to promote sustainable aquaculture, this project aims to increase awareness, understanding, and appreciation of the interconnectedness of people, food production, and the environment, and to promote teamwork and community involvement for the benefit of the Pacific Islands.

Department of TROPICAL PLANT AND SOIL SCIENCES

Department of Tropical Plant and Soil Sciences Grand Challenges in Agriculture

The faculty of the Department of Tropical Plant and Soil Sciences (TPSS) engage in *Research*, *Extension*, and *Instruction* to address grand challenges facing agriculture today and in the future. Here, we define two primary grand challenges that collectively encompass TPSS research and extension efforts as well as underlie our instructional programs: (1) improving food self-sufficiency and sustainability under a changing climate and (2) strengthening the agricultural economy in Hawai'i. The department's approaches to these challenges are necessarily broad and interdisciplinary, and operate at multiple scales to better understand and offer solutions at a systems level. The outputs from our research, extension, and instruction efforts are geared to providing impactful solutions to problems facing Hawai'i, the Pacific, and other areas of the world especially vulnerable to climate change.

We emphasize the combined need for significant contributions from research, extension, and instruction to meeting these grand challenges; and we acknowledge the emergent strengths and synergies that come from their interconnectivity. Below, we articulate more explicitly our approaches to address these two grand challenges. Implicit in these approaches is the training of globally competitive students with state-of-the-art skills and competencies; and the development, dissemination, and adoption of dynamic, evidence-based solutions to improve livelihoods in our communities.

Grand Challenge 1 Improving food self-sufficiency and sustainability under a changing climate

Disciplinary Framework - Having an interdisciplinary, systems-level approach is critical to effectively address this grand challenge. For ease of presentation, we divided the scale of investigation within the department into two components: 1) the molecular, cellular, and organismal scale (Plant & Soil Systems) to understand the underlying fundamental principles of agriculture, and 2) the ecological, community, and biocultural scale (Agroecology Systems) to develop economically and environmental sustainable farming systems. Some TPSS faculty work at one scale of investigation, but the majority of faculty work at both scales.

• Plant and Soil System Studies

 Genetics, genomics, molecular and cellular biology, physiology, and organismal biology

Agroecosystem Studies

 Production systems, ecosystem services, biocultural approaches, farm system management



Faculty in TPSS work within or across the two Disciplinary Frameworks. There is a near even distribution across those who work within a Disciplinary Framework and those who work across them (~1:1:1 distribution). Together, Instruction/Research and Extension faculty support each framework's gaps.

Current & Future Approaches - TPSS research and extension faculty, using one or both of the described Disciplinary Frameworks, address these broad areas of need listed below that are ripe for future growth.

- Crop Productivity & Resilience (biomass, yield, G x E, organismal interactions)
- Crop and Environment System Interactions (soil & water health and quality, water use efficiency, carbon capture, systems management)
- *Crop/germplasm Diversity* (floriculture, ornamentals, domestication, nutritional value, underutilized crops)
- *Diverse Agricultural Systems* (urban ag, ornamental, landscaping, edible landscaping, green roof, living walls, xeriscaping)
- *Protected and Predictive Agriculture* (modeling, remote sensing, Smart Farms)



Faculty in TPSS have strong expertise in Crop Productivity & Resilience, Crop & Environment interactions, and Crop/Germplasm diversity but are weakest in Protected and Predictive Agriculture.

The Role of TPSS in Solving the Climate Crisis

Modern agriculture contributes to 24% of greenhouse gases that exacerbate climate change, but we *can* develop agricultural solutions that mitigate the impacts of climate change and remain resilient through adaptation to ensure food security for a growing population. Each point of our Current and Future Approaches above encapsulates how TPSS faculty incorporates these core concepts into their work. *Crop Productivity & Resilience* directly provides ways in which crops may adapt to a changing climate. *Diverse Agricultural Systems* and *Crop/germplasm Diversity* ensures resiliency in our food supplies. *Protected and Predictive Agriculture* effectively controls growing environments that mitigates the many effects of climate change. And *Crop and Environment Systems Interactions* supports all of the points above, and provides strategies that directly reduces greenhouse gases. Together, our work ensures that agriculture becomes part of the solution to the climate crisis rather than a problem.

Grand Challenge 2

Strengthening the agriculture economy in Hawai`i

Current & Future Approaches - TPSS faculty engage in extension, instruction, and research that are essential to support and strengthen the agricultural economy in diverse ways. The collective effort from the TPSS Faculty produces impactful and positive outputs that improve the economy, sustainability and quality of life in our state in diverse ways.

• *Science-Based Workforce Development* (all levels: workshops/training programs; certificate, BS, MS and PhD degrees; continuing education programs)

- Cultivar Development and Marketing (resilient supply chain local to global)
- Sustainable Communities and Culture (viable, relevant, diverse, and scalable plant/soil/water solutions and agroecological systems)
- Integrative Sustainability (profitability, environmental protection, societal benefits)



Faculty in TPSS contribute to all areas we have identified fairly equally to meet this Grand Challenge. We recognize the need for strengthening and explicit cooperation between plant production and marketing that is essential for maintaining a viable food system and a strong agricultural economy.

Recognition of the Need for Change in TPSS

For our program to meet the changing needs of the state necessitates significant revisioning of the Tropical Agriculture and the Environment (TAE) undergraduate program. With a revisioned undergraduate program, our goal is to attract motivated and talented students and provide them with a rigorous, cutting-edge, science-based, solution-oriented education so they can tackle current and emerging challenges facing the state, nation and planet.

A group of faculty from TPSS, MBBE, PEPS, and School of Life Sciences have already begun discussions to map out two potential transdisciplinary undergraduate programs that consolidate, revitalize, and modernize our agriculture and related life science degree programs. Mirroring our two Disciplinary Frameworks, the new programs are <u>Molecular BioSystems</u> and <u>Agroecology Systems</u>. The Molecular BioSystems program emphasizes instruction in genetics/genomics, molecular and cell biology, and biochemistry from a *systems biology* perspective scaling from molecules to ecosystems. The Agroecology Systems program emphasizes instruction in core life science courses and their *application* to natural and managed ecosystems. Collectively, we envision that these two new programs will consolidate existing low-enrollment programs and result in increased student numbers, increased instructional efficiencies, and provide much needed updated learning outcomes to equip our students with the skills required to address and solve the problems of the 21st century.

We are excited and look forward to focused discussions with the CTAHR administration as we work energetically towards this goal.

Department of PLANT AND ENVIRONMENTAL PROTECTION SCIENCES

Plant and Environmental Protection Sciences

Grand Challenges and Importance of the Department

While President Lassner identifies agriculture, conservation, and human well-being as essential areas, **PEPS faculty are proposing the following changes to address grand challenges upon us**.

- DO NOT STOP-OUT enrollment of TAE program: TAE addresses the imperatives outlined by the President's Pandemic Plans - <u>We request a one-year grace period</u>, providing time to collect data for potential changes to improve the TAE program. Changes should be data driven so as to compare our program with successful programs at other agricultural colleges to address issues that are pertinent, attractive to students, and develop a curriculum that is relevant to the future of Agricultural and Environmental issues. We will be mindful to modernize course content while retaining relevant historic elements. We will seek to streamline course offerings. Our understanding is that this comes down to our willingness to address the issue and make appropriate curriculum changes that will be important in avoiding the stop-out. TAE is a joint program between PEPS and TPSS, and we look forward to working together as a joint faculty to make changes.
- Reinvigoration of PEPS graduate programs: We propose that the Entomology and Tropical Plant Pathology graduate programs be reorganized into two programs: a single Entomology Graduate Program offering MS (Plan A and Plan B) and PhD and a single Tropical Plant Pathology Program offering MS (Plan A and plan B) and PhD. This would match the programs offered by our peer institutions, not violating any prohibitions in BOR. After all, the classes taken by MS and PhD students are from the same pool, taught by the same instructors, and supervised by the same program chair. In addition, we would survey local government inspectors and PacificIslands biosecurity organisations for their interest to enroll in a Professional Certificate in Agrosecurity.

Here are a few highlights to show PEPS is essential to move Hawaii economy forward:

- No agricultural industry would survive in Hawaii without pest management. Any agricultural endeavor in Hawaii will encounter pests (insects, pathogens and weeds). <u>PEPS is at the front line of Agrosecurity.</u> [Critical issues: coffee berry borers, spittlebugs on cattle pasture, papaya ringspot virus, basil downy mildew, honey bee health, etc.]
- PEPS makes important contributions to conservation and land stewardship from invasive species management, conservation of endangered species, to diagnosis of forest disease outbreaks. We support NREM programs as they need expertise in entomology or plant pathology. [Critical issues: rapid ohia death, koa wilt, invasive Scolytine beetles that attack native trees, for example].
- PEPS offers outreach services to urban structural, turf and landscape pest management supporting Hawaii Sustainable living and tourism industries [Critical issues: invasive yellow crazy ants, fire ants, bed bugs, termites, coconut rhinoceros beetle, etc]
- PEPS trains and nurtures the next generation of skilled workforce in agriculture, urban and land management, quarantine inspectors, laboratory technicians, scientists and professors knowledgeable in science and technologies (from molecular, greenhouse to field research). We offer the only 'Tropical Plant Pathology' and the only Tropical 'Entomology' graduate programs in North America and the Pacific. Hawaii is the gateway between Asia and the Pacific, many Asian and Pacific countries/territories are looking for expertise in pest management from

PEPS, <u>making us central to UH's Asia-Pacific mission</u>. International students come with their government scholarships to enroll in PEPS' programs.

• Whereas **PEPS faculty secure 27% of the extramural grant funding in CTAHR**, PEPS faculty represent only 10% of the total CTAHR faculty. On average, PEPS faculty actively teach 23.7 credits/FTE to sustain rigorous Entomology and Plant Pathology graduate programs, and support Tropical Agriculture and the Environment (TAE) undergraduate program with TPSS.

Action item we are requesting:

- Returning faculty positions (Mycology, Entomology, Pesticide Specialist) or APTs (e.g Pesticide Education) to PEPS This would result in additional funding from government agencies (HDOA, APHIS, DLNR, EPA, IR4) as well as other competitive grants (NIFA, NSF). In return, PEPS 1) prepares more Hawaii residents to fill the jobs Hawaii needs (quarantine inspectors, conservationists, managers in pesticide industries, pest control managers in ag industries, college instructors, USDA or University scientists etc) or open students to job opportunities elsewhere; 2) prepares Hawaii for the next generation of agriculture technology Gene editing to develop pest resistance; contemporary genomics tools for rapid diagnostic of plant pathogens; utilize biocontrol quarantine facility that can lead to mass rearing and release of biocontrol agents that can safeguard Hawaii crop industries and natural ecosystems hampered by invasive species.
- What will happen if things do not change or not supporting PEPS related programs?

<u>Hawaii will be weak</u> in skilled task force in the field of pest management and land conservation; local skilled jobs will be offered to outsiders; <u>We will be limited in the current effective online</u> <u>courses related to Pest Management; missing out on more ag jobs created by our graduates</u> <u>when they start new entrepreneurship; less income for UH</u> from our training of graduate students that received scholarships from international Universities and industries that need tropical ag in their countries. Continued reduction in PEPS faculty would <u>make UH less</u> <u>competitive with other land grant universities</u> that usually have strong ag programs.

• What is the expected salary of PEPS graduates? (source indeed.com; glassdoor.com) Entry level with:

- ✔ B.S. State: \$32k Fed: \$36k; Private sector: \$46k
- ✓ M.S. State: \$32-41k; Private sector: \$48-70k; Fed: \$50-60k
- Ph.D. Post-doctoral \$35-48K (University), Post doc (Federal)- \$55-60K; junior research -\$65k; University faculty - \$80K; Professional (e.g. ARS)- \$85k; Private industries - \$95k

Jobs available to PEPS graduates: <u>PEPS graduates are qualified for high skill jobs.</u> Accessing websites on 19 Sept 2020, the Entomological Society of America lists 21 advertised vacancies; the American Phytopathological Society lists 27 advertised vacancies in the academic fields, government agencies or industries. All of which our graduates would be qualified. <u>Currently negotiations are under way to develop a new Hawaii state biological control containment and research facility</u> (shared facility for HDOA, USDA, UH through federal fund) <u>which will create positions for ~ 90 graduates in plant pathology, entomology and related disciplines</u>, from technician level to scientist and managerial positions. With increased concerns on invasive species stem from global warming concern, this trend will continue for many years to come.

Department of MOLECULAR BIOSCIENCES AND BIOENGINEERING

Molecular Biosciences and Bioengineering Highlights and Grand Challenges

MBBE represents advanced technology in CTAHR. We teach Biological Engineering, Biochemistry, Molecular and Cell Biology, Bioinformatics, and Biotechnology, with the understanding that together these subjects support the foundation of new technologies to advance human needs. Our faculty conduct innovative research on crops, snails, and microalgae, isolate novel and useful bioactive molecules, and make improvements in these molecules using recombinant technology and biochemical methods. We also work for developing disease resistance in Hawaii's agriculturally important plants like papaya and forestry trees - *Acacia koa* and giant leucaena. Our biological engineering faculty creatively manipulate biomolecules and biological systems for addressing the next challenges in Hawaii. The following are some highlights of the MBBE department.

MBBE Graduate program: MBBE Graduate program represents one of the most successful intercollege, interdisciplinary graduate programs at UH. Since 2000, MBBE has collaborated with JABSOM, CRCH, College of Natural Sciences, HNEI, Sea Grant program, Hawaii Agriculture Research Center and other CTAHR departments like HNFAS, TPSS and PEPS for training our next generation of researchers and educators with PhD and MS degrees. The goal of the program is to prepare a well-trained workforce for Hawaii. The program awarded 110 PhD and 151 MS degrees from 2004 to present. Our graduates have been publishing in high-impact journals and are getting employed in both academia and industry. Some of our past graduates have reached leadership positions in academia and industries. The program has currently 70 students, 40 of them are PhD students and 30 are MS students.

Biological Engineering (BE) UG Program: The BE UG program prepares students to work in various agricultural and environmental engineering industries in Hawaii. Sixty-five students have graduated from the program since 2009. A few of these graduates joined MS and PhD degree programs and the rest got suitable employment opportunities in several companies in Hawaii.

Molecular Biosciences and Biotechnology (MBB) UG program: MBBE is the training hub for Biotechnology at UH. The MBB UG program was started in the year 2013. So far 52 students graduated from the program. The MBB UG program is unique because all students gain two semesters of research experience in a laboratory. All graduates got accepted in various graduate programs, including JABSOM's MD program and MBBE's MS and PhD programs.

Recognition of Faculty: Our faculty showed outstanding achievements in research and teaching. The Board of Reagent's outstanding research award was received by Qing Li (2020) and Samir Khanal (2018). Pratibha Nerurkar received the Board of Reagent's outstanding Mentoring award in 2020. Qing Li also received the American Chemical Society (ACS) Award for Research in Chemistry of Agriculture in 2017 and ACS International Award for Research in Agrochemicals in 2020.

MBBE is responsive to new technology: Our faculty develop and teach modern cutting-edge technology courses to meet new challenges of time. Recently, Zhiyan Du developed a new laboratory course on **CRISPR Technology**, where the latest methods of gene editing in plants, animals and microbes will be taught to MBB and Biology students.

Grant supports: MBBE faculty have excellent external grant funding records. In 2020, MBBE faculty received five new extramural grants and contracts.

Grand challenges:

(i) Innovation and application of modern technology for agricultural and industrial development are essential for speedy recovery of Hawaii's economy from the current financial crisis. MBBE's grand challenge at this critical time is to provide a technological knowledge base for training the next generation of scientific and technological workforce in Hawaii. MBBE will continue to play the leadership role in teaching, research and graduate student training in the areas of molecular, biochemical and bioengineering technology in CTAHR. Our collaboration and friendship with the School of Life Sciences, and the researchers at JABSOM and CRCH are strong. We look forward to opportunities for enhancing these partnerships and collaboration in research, teaching and graduate education. We hope that our new lab course on CRISPR Technology will bring excitement and new opportunities for our students and researchers. (ii) Currently, we have only four faculty members under the BE program. It is urgent that we hire at least two new Assistant Professors in biological engineering, without which ABET accreditation of this degree program may be adversely affected. Similarly, filling up the vacant departmental secretary position is also essential for smooth running of the department.

Ongoing Discussion of BE faculty with the College of Engineering (CoE): The BE faculty has initiated discussion with David Ma, Interim Associate Dean of CoE, to begin exploring the possibility of co-administration of the Biological Engineering academic program by both CoE and CTAHR, to eventually offer the Biological Engineering BS degree through CoE. However, the current BE faculty (and their research programs) will remain in CTAHR. By establishing stronger collaboration with CoE, and offering the BE BS degree in CoE, it has the potential to grow the BE program significantly, considering that BE is an engineering degree. This discussion has just started, so it may take some time to finalize. In the meantime, the BE program will increase its effort to recruit students from community colleges.

Department of HUMAN NUTRITION, FOOD AND ANIMAL SCIENCES

Department of Human Nutrition, Food and Animal Sciences Response to the Budget Committee's Suggestions

**Comments from HNFAS faculty are inserted as <u>underlined text</u> below.

Summary Recommendations

- Consider modifying the MS in Food Science into a professional master's program, in collaboration with Outreach College.
 - Although we appreciate this suggestion, considering our existing resources, converting our MS in Food Science to a professional degree would not better serve our state. Our current MS program serves a broader range of students, while a professional degree would be limiting. Our existing program has allowed graduates to successfully obtain jobs in the food industry in Hawaii and also serves as a pathway for future PhD studies (including the Nutritional Sciences PhD program and other programs within CTAHR). The current MS in Food Science program broadly prepares future graduates for careers in industry, academia and government. Since our MS in Food Science program is researchbased, it provides opportunities for students to receive funding for their academic program (e.g., via various grant mechanisms) and helps students to develop a broad skill set and understanding of food science from research to food supply to practice in our local food system. Our current MS in Food Science program offers both a Plan A (thesis) and Plan B (non-thesis) option, the latter of which has been used in the past by nontraditional students. A Plan B, in fact, can be considered as a type of professional program. Our MS in Food Science program has also established 3+2 agreements with four universities in China. Upon completion of the degree requirements, students in the 3+2 program can earn bachelor's degrees from their home institution in China and Master's degrees from UH Manoa in five years. We have had six graduate students on this path. In addition, our MS degree has been growing for the past few years after a decline. We have used this trend to show that our PhD program (on probation) will meet the requirements for full status.
- Continue to monitor enrollment and support for graduate students in the PhD in Nutritional Sciences.
 - <u>The Nutritional Sciences PhD program currently has 19 students enrolled. To further</u> <u>support growth, a recent modification was approved and implemented. This modification</u> <u>developed 3 tracks within the PhD: Animal Sciences, Food Science, and Human</u> <u>Nutrition. The tracks clearly define curriculum and opportunities for students from all</u> <u>disciplines of the HNFAS department and will support recruitment of new students. We</u> <u>will continue to monitor enrollment and are continually seeking support for our students</u> <u>through grants.</u>

Details

• The Department offers the BS and MS in Animal Sciences, BS in Dietetics, BS in Food Science & Human Nutrition (multiple tracks), <u>MS in Food Science</u>, and the MS and PhD in Nutritional Sciences. The BS in Dietetics (previously a track in the BS in Food Science and

Human Nutrition) is professionally accredited. The BS in Animal Sciences includes a preveterinary track.

- There are <u>154</u> enrolled in the BS in Animal Sciences, <u>28</u> in the BS in Dietetics, <u>104</u> in the BS in Food Science & Human Nutrition, <u>10 in the MS in Animal Science</u>, <u>7</u> in the MS in Food Science, <u>11</u> in the MS in Nutritional Science, and 19 in the PhD in Nutritional Sciences.
- Faculty FTE in the department is <u>25 (22 G-funded and 3 grant-funded)</u> distributed across Animal Sciences, Food Science, and Human Nutrition.
 - <u>The Animal Science needs 3.58 FTE/year to cover its BS and MS curricula; current</u> <u>ANSC faculty together include just 2.8 instructional FTE. Therefore, there is a 0.78 FTE</u> <u>instructional deficit. Faculty losses in the program (totaling 0.9 instructional FTE) have</u> <u>specifically resulted in the inability to offer core courses in animal production and</u> <u>management.</u>
 - <u>The Animal Science faculty currently have a total of 1.35 extension FTE and the</u> <u>Department has lost 3.0 FTE within the past 2 years. This loss in extension directly</u> <u>impacts the ability of CTAHR to meet the needs of its livestock and aquaculture</u> <u>stakeholders.</u>
 - <u>Food Science and Human Nutrition faculty needs 7.7 FTE/year to cover its</u> <u>undergraduate and graduate programs; current FSHN faculty together include 5.5</u> <u>instructional FTE. Therefore, there is a 2.2 instructional FTE deficit.</u>
 - Therefore, the department needs to hire, at the minimum, **two animal science faculty** for teaching applied animal production and management and two food science and human nutrition faculty to meet the instructional workload and course/internship requirements for current students to graduate on time.
- The BS in Food Science and Human Nutrition has 5 tracks, including Food Science: Business, Food Science: Culinology, Food Science: Pre-professional, Human Nutrition: Preprofessional, and Human Nutrition: Sports Wellness. We are unable to pull enrollment by concentration/track. The Food Science Business and Pre-professional tracks share a common core of 34-36 credits, with 15-18 credits reserved for specialization. The Human Nutrition Sports Wellness and Pre-professional tracks share a common core with 15-24 credits reserved for specialization. The Culinology track offers a 2+2 pathway for UHCC transfer students.
- The BS program in Dietetics is the only accredited program to train Registered Dietitians in Hawaii and Pacific Region. The need for Registered Dietitians is expected to grow in parallel with the aging population of the State, and this programs like this are essential to manage the needs of growing numbers of individuals with chronic health conditions such as obesity, diabetes, and kidney disease and to provide services in the prevention of those aforementioned conditions.
- The PhD in Nutritional Sciences struggled with low enrollment, which delayed its conversion to established status for a number of years. The program enrollment appears healthy at 19, however we recommend that the Department continue to give this program attention.
 - See response above.

- Enrollment in the MS in Food Science is currently 8, and of the faculty, there appears to be 4 associated with the program. The program offers 6 concentrations, including food safety and quality, food processing and engineering, food chemistry and biochemistry, food microbiology, food science education, and "special area." Given the low enrollment and number of faculty, recommend that the Department greatly reduce the areas of concentration.
 - <u>There are actually just three faculty associated with the Food Science MS program, who</u> <u>also support and complement the FSHN BS and Nutritional Sciences PhD programs.</u>
 - <u>Although the current language for our program mentions those 6 areas or concentrations,</u> <u>students are not required to specify their concentrations. This language was specified to</u> <u>communicate potential areas of research projects and faculty expertise, not to</u> <u>differentiate subprograms within our program.</u>
- The MS in Food Science is designed to prepare students for positions in academia and in the food industry. Recommend that the faculty consider whether the program would be more successful and better serve the state as a professional master's degree. Cornell University offers a Master of Professional Studies in Food Science that could serve as inspiration: https://foodscience.cals.cornell.edu/graduate/master-professional-studies-mps/
 - We appreciate the suggestion to consider Cornell University's program as a model. We are familiar with Cornell's program and do recognize that they have had success with their program. However, part of Cornell's Professional degree success is due to their larger faculty numbers (~40 food science faculty, not including instructional lecturers). If we were given more faculty hires, we could consider this suggestion or consider other strategies to expand the impact of our MS program. However, within our HNFAS department, we only have 3 food science faculty, so it currently is not possible to develop a program such as this in addition to our existing undergraduate and graduate programs. Cornell's Master of Professional Studies in Food Science has benefitted non-traditional MS students who already have established careers in the food industry and have financial support from their employers to enroll in the program. In Hawaii, this sort of program could theoretically offer the opportunity for current professionals to get an advanced degree while working. However, in reality our local food science professionals often do not have the same time protection, salary equivalence, and financial support as analogous job positions in the continental US do.
- <u>HNFAS hosts the USDA regional aquaculture center in the Pacific region (Center for</u> <u>Tropical and Subtropical Aquaculture, CTSA). Through CTSA, we are working with all</u> <u>higher education institutions and industry in the US-affiliated Pacific Islands to revitalize</u> <u>aquaculture development.</u>

Other notes provided by HNFAS Faculty:

1. The HNFAS Department provides critical research and extension support to livestock and aquaculture production, both of which are key areas of the state's agricultural production with the potential to expand and grow the state's economy.

- With the recent reduction in the number of faculty due to retirements and the increased instructional demands with our growing numbers of students, it is becoming increasingly difficult to provide the research and extension support needed.
- 2. The Budget Committee did not propose any modifications to the **Animal Science program.** The Animal Science BS program has the second largest enrollment in CTAHR (154 students, and with its graduate program it is the largest program in CTAHR), with an increasing trend over the past decade. As a result of several faculty retirements over the last few years, there are currently just seven (7) ANSC faculty with a combined instructional FTE of 2.8 (total 8.35 for HNFAS).
 - Despite the economic tightening that is anticipated, we urge the administration to fill positions within our department to help ANSC meet the needs of the students. The Animal Science program needs to hire additional faculty with practical experience to provide high quality instruction, research, and extension in livestock production. The American Society of Animal Science, the premier organization in this field, is developing an accreditation program for Animal Science degree programs, and instruction in livestock production is a required component. Without this critical component, we risk not being accredited and losing students to programs that are accredited.
 - Swine are a key element in Hawaiian culture and expertise in swine production is needed in a Hawaiian place of learning.
 - Plans to address changing student needs and interests by expanding the companion animal component of the program are underway and will also need instructional support.
- 3. Although we understand the difficulty with budget cuts, we urge the administration to consider the need to invest in food science and technology for Hawaii. In other states, we have seen successful collaboration between industry, government and academia to solve various food-related issues, such as improving the safety, quality, and nutrition of the food supply and developing more efficient and sustainable supply chains. If given the opportunity, imagine the impact we could make on the existing challenges that plague Hawaii! However, we simply do not have enough faculty to support the food science and technology needs of our community. From an instructional perspective, we do not even have the minimum faculty number required (4 is the bare minimum) to be considered an approved Food Science Undergraduate program by the Institute of Food Technologists (IFT), our premier professional and scientific society. Without this seal of approval, we will lose both local and out-of-state enrollment to universities that have IFT-approved programs. In essence, due to our limited faculty number, we are barely able to serve our students and are not able to serve Hawaii to our full potential. In the future, please let us hire more food science faculty with the necessary expertise so that they can help us to better serve our students, our local businesses, and local community. At bare minimum, please let us fill the position of our food science faculty member who unexpectedly passed away in 2017. We currently see two main areas of expertise that need to be addressed: food safety and food chemistry (as it relates to the stability and quality of our food supply). A safe and efficient food supply chain has always been a critical need of Hawaii. Due to post-COVID changes in business models, the need for a key position/ expert in food safety (e.g., FSMA, HACCP, HARPC) is even more crucial to ensuring the safety of our local food supply and to support local enterprises. We have loosely stated the second need as "food chemistry" as the individual in this key position

formerly (unexpectedly passed away in 2017) fulfilled our instructional food chemistry needs. However, this key position goes beyond this "food chemistry" title in that the expert is needed to collaborate with the existing manufacturers and many emerging small food product businesses to ensure quality and nutrition of the products they are making. The existing faculty have received numerous requests for assistance with food analysis, shelf-life testing, food law/legislation, etc. Although the existing faculty have provided some resources for these requests, a dedicated faculty expert would be better able to serve these specific needs for a continually growing industry.

4. There is a clear and urgent need to reinvigorate and expand aquaculture education, extension and research efforts for the state of Hawai'i and Pacific region. The Department of HNFAS receives many inquiries and applications from students and faculty interested in aquaculture undergraduate and graduate programs. At present, however, HNFAS/CTAHR has only 0.3 FTE to cover aquaculture-related instruction at UHM and recent hiring freezes have prevented further expansion of an aquaculture program within the department, including a previously proposed certificate of aquaculture within the Animal Sciences bachelor's degree. Currently, HNFAS/CTAHR is collaborating with the University of Hawai'i Sea Grant College Program on two NOAA National Sea Grant Office-funded national aquaculture initiatives to: 1) establish an aquaculture research and education program at the university that leverages and integrates CTAHR and Sea Grant research, extension, and education resources and activities, through the building of a new facility, the Tuahine Aquaculture Research and Education Center (TAREC), at UHM; and, also in partnership with the Pacific Aquaculture and Coastal Resources Center (PACRC) / UH-Hilo (UHH), 2) to revitalize and expand an aquaculture development program through the establishment of an aquaculture-focused, collaborative program that is inclusive across Hawai'i and the Pacific region. This includes increasing extension capacity in aquaculture, promoting the development of a regional aquaculture education program that leverages curricula, training courses, and developing and disseminating extension materials to aquaculture audiences. Within the latter objective there is particular interest in leveraging state-wide aquaculture extension and instruction capacity towards the development of a UH-wide aquaculture program, spearheaded by a collaboration between CTAHR and UHH.

Specifically, aquaculture education is very limited across the UH System of 10 campuses. Some courses are offered at CTAHR such as Aquaculture Production, a core undergraduate HNFAS course (cross-listed with Oceanography) that is offered at the senior undergraduate level and also attracts graduate students. An Aquaculture Production Laboratory course (listed in the ANSC course catalog but currently not offered due to the lack of suitable facilities and instructional FTE) could also be offered at UHM, pending completion of TAREC and sufficient instruction effort. UHH offers a bachelor's degree in Agriculture at UHH with a specialization in aquaculture and the University of Hawai'i Windward Community College offers three aquaculture-related courses. None of the campuses offers a full bachelor's or graduate degree in aquaculture, although one may earn related degrees such as a Master's in Animal Science, Zoology, or Tropical Conservation Biology and Environmental Science.

Recently, we have additional resources for us to initiate aquaculture program. The Center for Tropical and Subtropical Aquaculture (CTSA), one of five USDA Regional Aquaculture Centers has come to HNFAS. The mission of is to support aquaculture research,

development, demonstration and extension education to enhance viable and profitable U.S. aquaculture. The Center carries out this mission throughout Hawaii and the U.S. Affiliated Pacific Islands of American Samoa, Guam, Palau, CNMI, the Marshall Islands, and the Federated States of Micronesia. The program has served an important role in the development of aquaculture throughout the U.S. affiliated Pacific Islands. Through CTSA network, we will attract more students from the Pacific Region. Also, CTSA is the only government-funded program in Hawaii now that is focused solely on aquaculture. With their combined available annual funding, HNFAS together with CTSA, University of Hawai'i Sea Grant College Program (Hawai'i Sea Grant) aquaculture program, and PACRC at UH Hilo can collaborate on aquaculture program development in the UH system that also extends to the US-affiliated Pacific Islands. In addition, the US Congress has been appropriating millions of dollars in aquaculture funding (e.g., \$13M in FY 2020) through the NOAA National Sea Grant Office to support aquaculture activities nationwide. This presents an opportunity to strengthen and enhance CTAHR's partnership with Hawaii Sea Grant in aquaculture as well as with the other partners mentioned. It is timely and a great opportunity for the University to develop a system-wide and Pacific region-wide aquaculture program through these organizations. Discussion on how this will be implemented will need to be determined.

Specific recommendations:

- Explore the potential of offering existing and new aquaculture courses and trainings across the collaborative program network via distance learning, including laboratory courses which will utilize demonstration sites for hands-on learning activities.
- Examine opportunities to co-instruct or provide guest lectures in aquaculture courses and trainings across the collaborative program network including those areas listed above.
- Through ongoing collaborations with Sea Grant and UHH-PACRC, engage in the identification of aquaculture education curricula and other relevant resources from the Sea Grant aquaculture network and integrate them with modifications appropriate to place, culture, socio-economics etc. across the collaborative.
- Network with other Sea Grant and Land Grant programs that do formal and informal aquaculture education and explore opportunities to leverage resources and partner on education-related activities.
- Through the activities highlighted above, develop a pathway for a unified and consistent program in aquaculture education throughout the UH system.

Conclusion: The Department of Human Nutrition, Food and Animal Science has strong enrollment within the various programs and has the potential for additional growth. The allied programs of Food Science and Human Nutrition and Animal Science are committed to serve the needs of students and the community. Critical support is needed at this time, however, to support the growth of these programs. As we emerge from these lean years, this strategic investment will yield research and extension programs that address the unique needs of the state and graduates prepared to support diversifying the state's agricultural sector through livestock/aquaculture production as well as food scientists with potential to demonstrate value of locally food products and skills to support the food processing and value-added sectors.

Department of NATURAL RESOURCES AND ENVIRONMENTAL MANAGEMENT

Natural Resources and Environmental Management

Response to Provost Recommendations with Specific Recommendations

Overview

The preliminary recommendations from Provost Bruno for the NREM department revolve around increasing student numbers, and include:

- 1. Utilize the SUST cross-listed courses to recruit majors.
- 2. Consider developing combined bachelor's-master's degree pathways with the (new) Interdisciplinary BA in Sustainability, and the BS in Global Environmental Science

NREM is already doing these things. Undergraduate (UG) enrollment has more than doubled in the past 10 years (57 to 130 students), and our graduate enrollment has averaged almost 10 students per research FTE (currently 57 graduate students). Our graduate committee is already working with the GES program on a 4+1 degree in our Master's of Environmental Management (MEM) professional graduate degree program. We have the most SUST cross-listed courses across the UH system (16). While there is no BA in Sustainability at present, faculty in NREM were critical to the development of the proposed Undergraduate Certificate in Sustainability, and NREM currently offers one of the two core courses in that certificate.

The primary challenge that NREM has faced for over five years in terms of rapidly growing undergraduate enrollment has been a decline in faculty FTE, especially in instruction (I). Our instructional FTE peaked in Fall 2012 at 5.05 when our enrollment was **76 UG** and **69 GR students (145 total)**. This fall, instructional FTE is 4.5, while our enrollment is **130 UG** and **53 GR (183 total)**. FTE in research (R) is likewise down from 2012, so we have significantly less faculty FTE to serve the needs of our students and external stakeholders. Regardless, our faculty have significantly increased the number and value of extramural research and extension funding awards and scholarly outputs over that time (**\$12,336,181** in external grants as PIs for the years 2015-2019 and **\$2,356,893** as co-PIs). Our I, R, and E programs are also well-integrated, providing opportunities for students and stakeholders to benefit from engagement in each of them, while addressing vital needs, such as sustainable food supply chains, resilience to climate change induced disasters, and response to rapid 'ohi'a death within our state and the broader Pacific.

Specific Recommendations/Requests

Considering our continued growth in enrollment, the mission and strengths of our department, the University's future priorities as described in President Lassner's imperatives, and the provost's recommendations, we have a set of recommendations for consideration and discussion with the college and the university. These would allow NREM to not only continue to grow our own program to address critical areas of excellence and challenges for the state and the world, they would also allow us to expand our existing collaborations with other units across campus such as GES and Sustainability. These programs have small internal faculty FTE; thus, they rely on units like NREM to carry much of their course and student mentoring load. **Overall, NREM requests administrative actions aimed at restoring our faculty FTE across I, R, and E to maintain equivalent functionality, rather than focusing only on growth in Instruction recommended in the Provost document.**

1. <u>Unfreeze the applied economics and social sciences positions in NREM.</u>

By replacing two of the multiple economics and social sciences faculty lost over the last ten years, the programs will be able to sustain continued growth, recruit students, and maintain our positive state-wide reputation. These positions were identified as priorities by the department and the college to replace retirements and resignations and to maintain the programs and strengths of

NREM and CTAHR. These positions encompass research and instructional duties and expectations. With our growth in UG enrollment, instructional faculty are consistently teaching over their I FTE. This compromises their ability to engage in research and extension, which may affect evaluations or decisions regarding tenure & promotion. It also reduces our ability to help the university meet President Lassner's vision moving forward. Without these positions, we may have to consider reducing our undergraduate enrollment and will be hard pressed to support other units on campus as we do now or to grow those collaborations.

2. If other academic units in CTAHR are reorganized or moved outside of the college, consider reassigning faculty with expertise in economics and other social sciences to NREM to support areas critical to natural resource recovery and resilience across the state.

NREM has lost significant capacity in economics and other social sciences due to retirements and attrition, which compromises our unique role in the state as an interdisciplinary department. We currently have 30 unassigned students in the undergraduate program wishing to specialize in social sciences who need to be assigned an advisor, but we have only two economists and one other social scientist to support them. The range of disciplines in the social sciences is as broad as the natural sciences, so we need breadth and depth in these areas to meet student and stakeholder needs. Maintaining breadth across disciplines is an inherent challenge to an interdisciplinary department which has been exacerbated by retirements and frozen positions.

3. <u>Strengthen the BA in Environmental Studies by moving it to NREM.</u>

If Recommendations 1 and 2 are implemented, we will have renewed capacity to manage growth in our programs and to engage in the partnerships suggested by Provost Bruno. Environmental Studies students already enroll in many core and elective NREM courses. As well, many NREM students enroll in courses across a broad range of departments to pursue diverse interests in the natural or social sciences, Hawaiian knowledge and practice, and management and entrepreneurship. Environmental Studies provides great flexibility for students but needs a strong core of faculty and programmatic structure to attract more students and improve student learning outcomes (SLOs). Moving it to NREM would allow us to strengthen the university's strategic initiative in sustainability and support President Lassner's vision for the UH System. This could also provide cost-savings to the University and better serve these students.

- 4. <u>Create degree pathways for the BA in Sustainability through a stronger partnership with NREM.</u> NREM has the most SUST cross-listed courses at UH-Manoa. As the only interdisciplinary program on campus, NREM is well-positioned to serve the needs of students interested in Sustainability. We already manage separate natural and social science pathways in our BS degree, including multiple specializations in each. We propose to help create degree pathways for the BA in Sustainability, using a combination of NREM and other courses, much as we do for our NREM specializations. This would support the development of focused and comprehensive SLOs, especially professional skills development.
- 5. <u>Provide an I-2/3 Position in the Social Sciences.</u>

In addition, an I-2 or I-3 faculty position in NREM would immediately address critical need areas in social science instruction, thereby allowing us to grow our own undergraduate program and better serve other units across campus. We were fortunate to get an I-2 position recently in the natural sciences, and that single position has transformed our undergraduate offerings by covering a number of core, required courses which allowed tenure-track faculty to teach elective courses in their areas of expertise that are needed at the undergraduate and graduate level to meet degree program requirements.

6. <u>Unfreeze the recently approved tenure-track faculty position in Wildfire Science and Management</u> Over the past 8 years, NREM has partnered with external collaborators and CTAHR to support a faculty position in a critical need area for the state in the science and management of wildfires. This has been incredibly successful. NREM and CTAHR are now recognized as the go-to source of expertise in this area. The faculty member in the position has brought in \$1.1 million in external funding as PI and \$1.8 million as co-PI. He also received the 2019 award for Excellence in Extension in CTAHR. This position, however, has been non-tenure track, and internal support for the position is no longer available. As a result, NREM was granted a tenure-track position in this area before it was frozen. NREM, CTAHR and UH will lose this position and this program unless they invest in it now.

Natural Resources and Environmental Management Follow up Document

The NREM Department contributes to sustainable land management, economies, and communities in the state of Hawaii and the Pacific using an interdisciplinary, social-environmental approach to scholarship, student training, and service. Our integrated programs of instruction, research, and extension support the university's priorities and strategic initiatives, including

- Becoming a Hawaiian place of learning by integrating Hawaiian knowledge and values into our courses, practices, and research
 - o Nearly 20% of our students identify as native Hawaiian
 - o 60% of students take Hawiian Studies courses as part of their NREM degree
 - Faculty hired as part of the Hui Aina Momona cluster in partnership with the Hawaiinuiakea School of Hawaiian Knowledge
 - o Extramurally funded student projects in biocultural restoration and cultural ecosystem services
- Developing and evaluating sustainable agro-ecosystems that are resilient to climate change, conserve natural resources, and strengthen local communities
 - o Sustainable development of forestry, agriculture, and fisheries
 - o Statewide soil health evaluations and recommendations
 - o Management of soil and water, wildlife, watersheds, invasive species, and wildfire
 - o Quantifying, optimizing and managing ecosystem goods and services
 - o Supporting community and indigenous management of natural resources
 - o Addressing climate change impacts, adaptation, and mitigation
- Student Success and Preparing Hawaii residents to fill Hawaii's needs
 - Doubling of undergraduate enrollment from 2010-2020 (57-130)
 - o Half of enrollment in our required courses and one-fourth in our electives are non-majors
 - o Half of NREM undergraduates started as transfers from other UHM departments or universities
 - o 75% of NREM BS majors graduate within 4 years
 - o Hawaii experienced 7% annual growth of natural resource management jobs, 2014-2019
 - o Employers value interdisciplinary skills to manage complex social-ecological systems
- Research as an economic and intellectual driver
 - o Brought in \$12,336,181 in external grants as PIs and \$2,356,893 as co-PIs, 2015-2020
 - o 390 scientific and technical papers, up 80% over the previous 5 years

To maintain our success and continue to grow our programs, NREM requests administrative actions aimed at:

- (i) bolstering our interdisciplinary instructional FTE, especially in applied economics and other social sciences, and
- (ii) maintaining our faculty FTE across I, R, and E to continue providing interdisciplinary and integrated instruction, scholarship, professional training, and service.

With this support, NREM will be capable and ready to support related efforts across campus, including partnering with **Global Environmental Science** (4+1 BAM), **Interdisciplinary Studies** (BA in Environmental Studies), and the **Institute for Sustainability & Resilience** (certificate and BA in Sustainability), as suggested by the Provost's team planning for a post-pandemic Hawaii. We have already begun discussions with these units to explore the Provost's recommendations and discuss the resources needed to ensure their success.

In short, NREM is a guaranteed and cost-effective investment to achieve these goals and bring in more revenue to support CTAHR and UH as we all work to help Hawaii recover and grow!