

Application for Federal Assistance SF-424

* 1. Type of Submission:

- Preapplication
 Application
 Changed/Corrected Application

* 2. Type of Application:

- New
 Continuation
 Revision

* If Revision, select appropriate letter(s):

* Other (Specify)

* 3. Date Received:

06/10/2022

4. Applicant Identifier:

5a. Federal Entity Identifier:

* 5b. Federal Award Identifier:

GRANT13654005

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: The Regents of the University of California (Davis)

* b. Employer/Taxpayer Identification Number (EIN/TIN):

946036494

* c. UEI:

TX2DAGQPENZ5

d. Address:

* Street1: Office of Research - Sponsored Programs

Street2: 1850 Research Park Drive

* City: Davis

County: Yolo

* State: CA: California

Province:

* Country: USA: UNITED STATES

* Zip / Postal Code: 95618-6153

e. Organizational Unit:

Department Name:

Nutrition

Division Name:

College of Agriculture/Env Sci

f. Name and contact information of person to be contacted on matters involving this application:

Prefix:

* First Name: Carrie

Middle Name:

* Last Name: Waterman

Suffix:

Title: Assistant Researcher

Organizational Affiliation:

The Regents of the University of California (Davis)

* Telephone Number: 530- 752-4630

Fax Number:

* Email: cwaterman@ucdavis.edu

Application for Federal Assistance SF-424

9. Type of Applicant 1: Select Applicant Type:

H: Public/State Controlled Institution of Higher Education

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Natural Resources Conservation Service

11. Catalog of Federal Domestic Assistance Number:

10.937

CFDA Title:

Partnerships for Climate-Smart Commodities

*** 12. Funding Opportunity Number:**

USDA-NRCS-COMM-22-NOFO0001139

* Title:

Partnerships for Climate-Smart Commodities _ Building Markets and Investing in America _s Climate-Smart Farmers, Ranchers & Forest Owners to Strengthen U.S. Rural and Agricultural Communities

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

*** 15. Descriptive Title of Applicant's Project:**

Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers

Attach supporting documents as specified in agency instructions.

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant

* b. Program/Project

Attach an additional list of Program/Project Congressional Districts if needed.

17. Proposed Project:

* a. Start Date:

* b. End Date:

18. Estimated Funding (\$):

* a. Federal	<input type="text" value="4,999,142.00"/>
* b. Applicant	<input type="text" value="0.00"/>
* c. State	<input type="text" value="0.00"/>
* d. Local	<input type="text" value="0.00"/>
* e. Other	<input type="text" value="0.00"/>
* f. Program Income	<input type="text" value="0.00"/>
* g. TOTAL	<input type="text" value="4,999,142.00"/>

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

- a. This application was made available to the State under the Executive Order 12372 Process for review on .
- b. Program is subject to E.O. 12372 but has not been selected by the State for review.
- c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes", provide explanation and attach.)**

Yes No

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

**** I AGREE**

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: * First Name:
Middle Name:
* Last Name:
Suffix:

* Title:

* Telephone Number: Fax Number:

* Email:

* Signature of Authorized Representative: * Date Signed:

Attachments

AreasAffected

File Name

Mime Type

AdditionalProjectTitle

File Name

Mime Type

AdditionalCongressionalDistricts

File Name

Mime Type

DebtExplanation

File Name

Mime Type

DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352
(See reverse for public burden disclosure.)

Approved by OMB

0348-0046

<p>1. * Type of Federal Action:</p> <p><input type="checkbox"/> a. contract</p> <p><input checked="" type="checkbox"/> b. grant</p> <p><input type="checkbox"/> c. cooperative agreement</p> <p><input type="checkbox"/> d. loan</p> <p><input type="checkbox"/> e. loan guarantee</p> <p><input type="checkbox"/> f. loan insurance</p>	<p>2. * Status of Federal Action:</p> <p><input type="checkbox"/> a. bid/offer/application</p> <p><input checked="" type="checkbox"/> b. initial award</p> <p><input type="checkbox"/> c. post-award</p>	<p>3. * Report Type:</p> <p><input checked="" type="checkbox"/> a. initial filing</p> <p><input type="checkbox"/> b. material change</p> <p>For Material Change Only:</p> <p>year quarter</p> <p>date of last report</p>
<p>4. Name and Address of Reporting Entity:</p> <p><input checked="" type="checkbox"/> Prime <input type="checkbox"/> SubAwardee Tier if known:</p> <p>* Name:</p> <p>* Address:</p> <p>Congressional District, if known:</p>	<p>5. If Reporting Entity in No.4 is Subawardee, Enter Name and Address of Prime:</p>	
<p>6. * Federal Department/Agency:</p> <p>Natural Resources Conservation Service</p>	<p>7. * Federal Program Name/Description: Partnerships for Climate-Smart Commodities</p> <p>CFDA Number, if applicable: 10.937</p>	
<p>8. Federal Action Number, if known:</p>	<p>9. Award Amount, if known:</p>	
<p>10. a. Name and Address of Lobbying Registrant (if individual, complete name):</p> <p>* Name:</p> <p>* Address:</p>	<p>b. Individual Performing Services (including address if different from No. 10a):</p> <p>* Name:</p>	
<p>11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when the transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.</p>	<p>* Signature: Alyssa A Bunn</p> <p>* Name: Alyssa A Bunn</p> <p>Title: Contracts and Grants Officer</p> <p>Telephone No.: 530-754-7996</p> <p>Date: 06-10-2022</p>	
<p>Federal Use Only:</p>	<p>Authorized for Local Reproduction</p>	

CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Statement for Loan Guarantees and Loan Insurance

The undersigned states, to the best of his or her knowledge and belief, that:

If any funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this commitment providing for the United States to insure or guarantee a loan, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions. Submission of this statement is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required statement shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

* APPLICANT'S ORGANIZATION

The Regents of the University of California (Davis)

* PRINTED NAME AND TITLE OF AUTHORIZED REPRESENTATIVE
--

Prefix: * First Name: Alyssa Middle Name: A
* Last Name: Bunn Suffix: * Title: Contracts and Grants Officer

* SIGNATURE: Alyssa A Bunn * DATE: 06/10/2022
--

Project Narrative File(s)

FileName	MimeType
Project_Narrative1035494633.pdf	application/pdf

Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers

I. Executive Summary

The intention of this project is to develop a cross-sectional partnership which fosters research, training, and development of climate-smart commodities (**CSC**) amongst small and/or underserved producers (**SUP**). We define SUP to include urban and rural farmers, ranchers, agroforesters, entrepreneurs, businesses, organizations, and extension service researchers that are owned and operated by and/or work for historically underserved and underrepresented minority groups including Black, Indigenous, and People of Color. We will train students and interns from minority serving institutions (**MSI**) on CSC monitoring and evaluation (M&E) techniques in two regions of significant agricultural, environmental, and historical importance:

West Coast (WC) Regional Hub, with University of California, Davis (UCD) as the primary research MSI linked to CSC training in climate crisis adaptations at an agroforestry farm, Sky High Acres (**SHA**) in Central CA, small CSC farms/ranches in Imperial County, CA, and urban CSC farms in Los Angeles and San Diego, CA (**SoCal**). Greenhouse gas (GHG) benefits will include restored ecological resilience to fires, landslides, and soil depletion. This will provide a model for CSC solution on farms and ranches facing drought, high temperatures, depleted soils, and low economic returns. **South East (SE) Regional Hub** with Seven Harvest, Inc. (**SH**), University of Arkansas at Pine Bluff (UAPB), Eastern Arkansas Enterprise Community (EAEC) and Grambling State University (GSU), Louisiana as the MSI/HBCU (Historically Black College and Universities) are linked to CSC training farms operated by several local and regional organizations with small to medium size farms, ranches and forests lands. This will provide an extensive CSC network in a historically and socially important agricultural region of the US.

The project leverages expertise and existing collaborations in CSC through our Food Justice network virtual hub globalfoodjusticecoe.org established in 2021 with listed partners, researchers, and organizations in Hawaii, Mississippi, Tennessee, Alabama, Florida, and North Carolina. It draws on the team's CSC expertise, knowledge base, field sites, pre-existing CSC curriculum, and training skills in applied research, extension services, computer science, social equity, and management through federally funded projects and peer-reviewed publications with SUP in the US, Africa, and Brazil.

Each regional hub will link MSI students and researchers focused on CSC programs with SUP implementing and training CSC in their respective states. The project will produce a co-developed, site specific, and site adaptable "**CSC tool kit**" for SUP to utilize. It will include **1) CSC materials** to improve soil, plant/tree, and ecosystem health (seeds, saplings, nature-based inputs, vermicompost, soil, biochar, vertical gardening systems, GHG emission tools); **2) CSC training manual** to implement CSC (low-till, nutrient management, vermiculture, urban/rural ag, agroforestry); and **3) CSC evaluation tools** to understand economic and environmental factors in the value chain (markets, GHG offsets). Training and implementation in both regions will address: **Soil Health:** Cover crops, low-till/no-till, nutrient management, enhanced efficiency fertilizer, on site nature-based inputs (NBI), soil amendments, vermicomposting,

biochar; Maintaining and improving forest soil quality, urban “soil” solutions including hydroponics and aquaponic systems.

Plant/Tree Health: Planting “smart crops” for high carbon sequestration rate and low inputs; Permaculture; Agroforestry and afforestation on working lands; Afforestation/reforestation and sustainable forest management; Increase on-site carbon storage through forest stand management; Increase on-site input production.

Ecosystem Health: Prescribed grazing or legume interseeding on pastures; Manure management; Fire management; Feed management to reduce enteric emissions; Buffers and grassland management; Tree planting on working lands.

Year 1 (Y1) will focus on **linking CSC funded partners with SUP and MSI** and student/faculty engagement. CSC focus groups will be conducted for needs assessment while development and investment in training sites will occur. Y2 will start to offer CSC cross-state, hands-on training and tools to reach a total of **330 SUP and 55 MSI students** and interns over the length of the project. Y2 will include **training, research and CSC analysis** for future years, and training curriculum. Participants will engage in M&E for GHG tracking, utilizing, testing, and developing tools. Y3 will **implement tuned CSC training and assessment tool kits** with participants, increase engagement with STEM students at MSI/HBCU, and assist active participants in grant/investment/and funding guidance within the CSC value chain. Y4 will focus on impact, expansion and M&E with anticipated reporting on increased number of CSC SUP, further refined CSC training materials, sustainable/externally funded CSC training urban and rural sites; publications, media coverage, and potential USDA CSC policy guidance. Y5 will host the final round of CSC trainees and further develop market opportunities for all existing and previous participants.

Our partners include established urban and rural farms (SoCal), ecological conservation and agroforestry sites (SHA), and a multitude of small and medium agroforestry farmers in the southern regions coordinated through SH. We will enroll at least 330 new and beginning CSC SUP that will directly benefit from our training. Established training farms such as SHA, SH, and adaptive/urban farming sites will simultaneously develop their CSC capacity while serving as research, development, and M&E site for co-designed and co-evaluated projects. SHA already has established plans for extensive CSC operations on-site. They will be able to invest funding in training infrastructure, implementation, and M&E in Y1-Y3, with expectation of sustainability and additional funding/ revenues from 2025 forward. SH has an established network and will operate through Y1-Y5 as the SE Hub with CSC training, research, extension, and M&E. Through our Food Justice network and USDA Moringa grant, we’ve established a strong partnership between UCD and innovative farmers in SoCal. These include farms run by Tony Lopez at Imperial Moringa who will provide on-site training in cultivation of CSC crops and techniques for high-heat and drought conditions. He has already partnered with over 100 farmers in the region who are eager to learn such techniques. James Brady and Cheryl Branch have worked with Dr. Waterman in the Los Angeles area with urban agriculture projects among SUP. We will host at least 60 SUP and 5 MSI M&E interns at the SoCal sites over the period of the grant. **The project will increase the number of SUP and adoption of CSC**, release publications and training curriculum,

form CSC hubs, and establish scalable **M&E tools developed at MSI for self-sustaining, climate smart farms, forests and ranches.**

Overall, we will focus these CSC goals aligned with USDA and our partners to:

- 1) Establish equitable access, benefits, and resources to SUP and contribute to advancing the supply chain.
- 2) Provide technical assistance, outreach, and training to all partnering entities.
- 3) Create a central system of collaboration to promote research reporting, bi-directional feedback, development of tools, systems, and processes to measure, monitor, report, and verify GHG benefits which will then inform future USDA actions and CSC.
- 4) Enhance CSC market development and scalability, helping SUP experience greater market returns and GHG benefits.

A. Contact Information

PI: Dr. Carrie Waterman, Institute for Global Nutrition, University of California at Davis

B. List of Project Partners

Western Region (California and Hawaii):

- Leonard Lumas, Sky High Acres, Lower Lake, CA
- James Brady, Con10u2farm, LLC. Imperial Valley, CA
- Tony Lopez, Imperial County, CA
- Cheryl Branch, Green Believers, Los Angeles, CA
- Dr. Ted Radovich, University of Hawaii, HI

Southern Region (Arkansas, Louisiana, Mississippi, and Tennessee)

- Dr. Barry Colley- SH, Forrest City, AR
- Dr. Gaidi Faraj - GSU, LA
- Dr. Obadiah Njue, UAPB, AR
- Dr. Robert Cole, EAEC, AR

C. List of underserved/minority-focused project partners

All project partners are operated by and/or serving minority businesses, universities and organizations. These are abbreviated as MO-Minority Owned/Operated, V-Veteran W-Woman (ex. MVO is owned/operated by, and serving minorities and veterans); MSI-Minority Serving Institution; HBCU-Historically Black College University); MSO- Minority Serving Organizations.

- Sky High Acres, Lower Lake, CA (MVO)
- Con10u2farm, Imperial, CA (MVO)
- Green Believers, Los Angeles, CA (MWO)
- 151 Farms, San Diego, CA (MSI)
- University of CA, Davis, CA (MSI- Hispanic Serving)
- Tony Lopez, Imperial Moringa, Imperial, CA (MO)
- The Worm Whisperer, Galt, CA (MO)
- Grocery Croppers, Sacramento, CA (MO)
- Creation of Society, Fairfield, CA (MO)
- Seven Harvest, Inc, AR (MVO)
- University of Arkansas at Pine Bluff, AR (MSI/HBCU)
- East Arkansas Enterprise Community, AR (MO)

- Delta Farmers' Cooperative, AR (MO)
- Delta Dirt, Inc., AR (MO)
- Forrest City School District, At Risk Youth Farmers, AR (MO)
- Marianna School District, At Risk Youth Farmers, AR (MO)
- Ellis Bell Caring Trust Farm, Forrest City, AR (MO)
- Carpenter Family Farms, Grady, AR, (MO)
- Mississippi Progressive Agriculture Group, MS, (MO)
- Drone Piloting Services, LLC, Joe Davis (MO)
- North South Institute, AR (MVO)
- Grambling State University, LA (MSI/HBCU)

D. Compelling need for the project

We are currently facing a complex multitude of crises affecting the agricultural supply chain. These include the climate crisis—causing drought, fires, erosion, and floods—all of which have added to higher costs of farm inputs and costs of goods. Political instability in Russia and China has further exacerbated the agricultural supply chain instability. Globally, our societies also continue to face the COVID-19 pandemic overlaid by an epidemic of chronic disease conditions such as obesity and diabetes—directly affected by limited access to affordable healthy foods. Our aims are aligned with USDA's vision to address these complex pressures through CSC implementation in some of the most critical regions and populations of the US. Our geographic focus highlights the compelling need to address severe environmental and economic inequities in the West and South respectively. Climate change disruptions currently threatening California's preeminence as the dominant agricultural state in the US will provide critical onsite opportunities to experiment, implement, measure, quantify, innovate, and verify CSC operations to minimize GHG emissions and sequester carbon. Working with designated partners, we will leverage expert consultants with MSI interns to implement training in CSC and **Strategies for Future Resilience in Ecological Restoration** (See Fig.1) at SHA. These strategies will be implemented at SHA and adapted to regional, social, and economic needs of SUP in SoCal and SE Hub partners. SUP representative SE states will be able to train CA and CA farmers in SE states to co-learn the most relevant CSC related to their production interests.

We believe our teams can co-learn and co-create from these unique regions and creative solutions drawn under pressures of social and historical barriers through the expertise of collaborating partners. Our team's past collaborative experience has demonstrated progress at a global level with USAID, NIH, and UCD projects aimed at the [UN Sustainable Development Goals](#) (specifically (1: No Poverty; 2: Zero Hunger; 3: Good Health & Well-being; 10: Reduced Inequality; 13: Climate Action; 15: Life on Land; and 17: Partnerships for the Goals), through a multitude of CSC funded projects among SUP.

Our multidisciplinary team sees this as an opportunity for growth and development by creating strategic partnerships to maximize the capacity and impact of SUP to participate in and co-design solutions to our most impending climatic challenges. This project will support the adoption of best practices in the management of local and regionally specific CSC values chains through training, extension, and M&E feedback.

A likely benefit that will accrue over the five years of our proposed project is moving through the process of research, development, implementation, evaluation, and verification to create scalable and replicable outcomes.

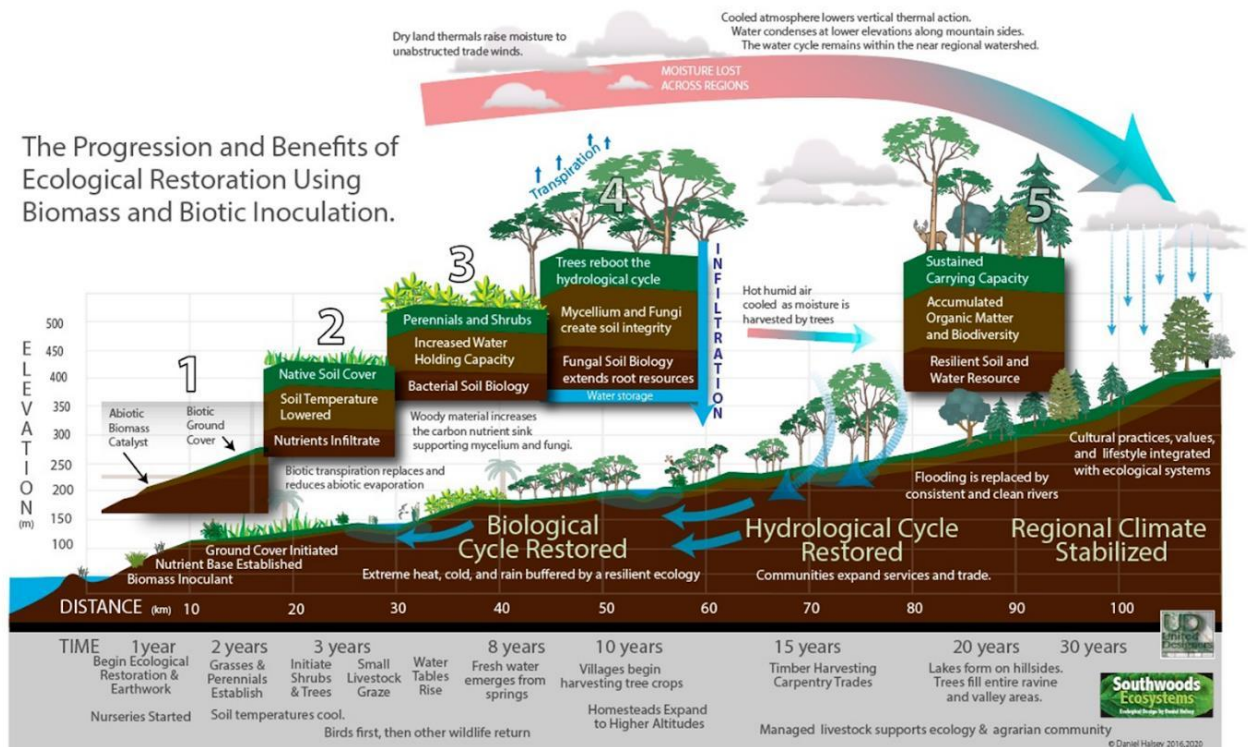


Figure 1. Model Farm Training Building Strategies for Future Resilience Utilizing CSC.

E. Approach to minimize transaction costs associated with project activities

By leveraging existing resources and current CSC projects, this collaborative partnership will lean on the multidisciplinary capabilities of our team members and their established facilities, farms sites, networks, and research capacity. We will minimize costs by using onsite facilities, in-house trainers, mentors, farms, businesses, and other resources that overlap with the aims of existing organizations and CSC businesses. A direct benefit of CSC production is it provides on-site inputs such as biofertilizers, biofeed, compost, soil fertility, resilience, all of which further reduce direct costs. CSC training for farmers and interns will be available in person and virtually-minimizing unnecessary travel. Pre-meetings, training, presentations, and demonstrations will be offered virtually, followed by in-person training to maximize time spent in-person on-site. We will enlist the support of the UC Davis Center on Food Justice managed by Cheryl Branch, to act as a facilitator of monthly meetings of our virtual hub to share findings and data, which will enhance the quality of implementation performance. This will also provide a platform for beneficiaries to stay involved, access the CSC market network, and participate after they complete CSC training without additional transaction costs.

F. Approach to reduce producer barriers to implementing CSAF practices for the purpose of marketing climate-smart commodities

This project is designed to address numerous factors contributing to barriers that exist for SUP. By customizing outreach activities and using various tools including community education initiatives, focus group meetings, co-designed projects with partners in M&E, and market risk reduction strategies. Our virtual platform will support distribution of information regarding funding opportunities and creating community-based access to partners. We will provide education, training, resources, and adaptable, transferable skills to empower SUP to overcome traditional barriers. Focus groups and community dialogue will solicit broader understanding of the unique needs and persistent barriers SUP experience in practicing and implementing CSC. The entirety of this project will provide openings to collectively think through solutions and expand opportunities for equitable participation in CSC markets and supply chains.

G. Geographic Focus

The location of this project will span at least six states including California, Arkansas, Tennessee, Mississippi, Louisiana, and Hawaii. Our CSC solutions target two district regions of significant agricultural and historical importance regarding environmental and social justice. (Figure 2: Adapted from [NYTimes, Feb 2021](#); including proposed hubs overlaid on 2017 map). California, the fifth largest economy in the world, has supplied the US and the world significant proportions of fresh fruit, vegetables, grains, nuts, and livestock feed. However, compounded years of drought and fires have pressed CA farmers to extreme environmental crises. CSC solutions implemented at SHA, in Imperial County, and in Urban Farms in LA will help mitigate these crises, while improving the environmental and economic resiliency of SUP trainees and participants. It will also provide a blueprint for SE partners to come and co-learn CSC implemented in CA. The South East region of the US represents the largest number of remaining Black and SUP that

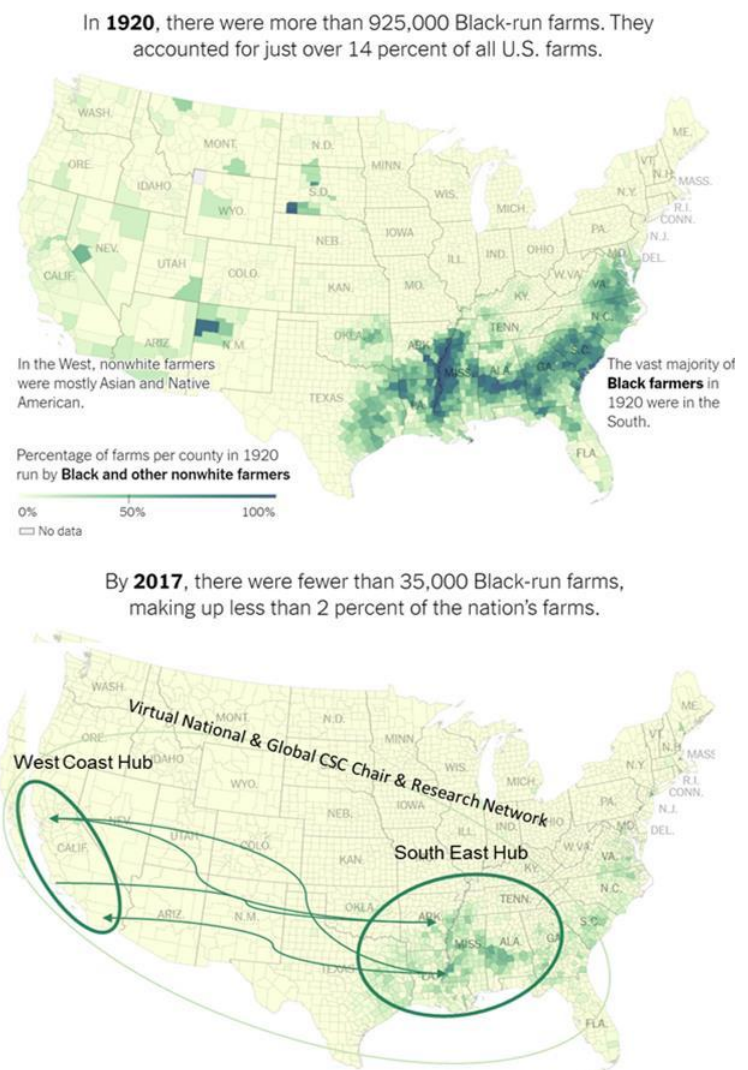


Figure 2. US Map of Black farmer in 1920 and 2017 (bottom) with CSC hub locations overlaid. (NYTimes, 2021)

will benefit greatly from CSC to revitalize the region and culture of farming. In the 1920's, the US had almost 1 million Black-run farms, over 14% of all US farms. By 2017, the US had less than 35,000 Black run-farms, accounting for ~1% of all farms([NYTimes, Feb 2021](#)); today the numbers are even less. Due to climate change in California threatening to disarm California as a leader in agricultural production, we see the opportunity to address the immediate impact of climate change onsite and to collaborate with current partners in other, high farming states. These partnerships have been strategically developed to gain access to larger communities of underserved farmers and producers, and to use their current community-based relationships and associations with MSI/HBCU to expand the impact of this project. Our virtual hub and phone apps will help to keep these two regional hubs connected for greater reach.

H. Project management capacity of partners, including a description of existing relationship with and/or prior experience working with producers or land owners, promoting climate-smart activities and marketing climate-smart commodities.

Using our current partnerships, we will leverage the capacity of our two regional CSC hubs on the West Coast (WC) and in the South East (SE) that are actively working together through the UC Food Justice Hub and USDA grants. The team recently submitted a NIFA planning grant for \$50,000 to utilize moringa along the CSC value chain as specialty crop, biofertilizer, and biofeed for cows. We received positive reviews and scored with “high likelihood of funding.” This and such other grants will easily integrate into this pilot project by providing additional funding for SUP and MSI interns. Most primary partners have worked with others for at least 5-7 years on various projects.

WC Hub: The PI, Dr. Carrie Waterman, is based at UC Davis, an MSI Land Grant Institution with expertise in CSC implementation. Waterman is currently the PI on a USDA Specialty Crop Block grant promoting moringa (*Moringa oleifera*) as a “smart crop” for food security, nutrition, and as a model CSC that has multiple uses along the value-chain including livestock biofeed applications that reduce methane production by cows.

SE Hub: SH, UAPB and EAEC will operate the SE Hub. SH has planned, implemented, and evaluated farm inspections for small, underserved farmers in Naturally Grown Certification, workshops in Good Agricultural Practices (GAP), farmer cooperative organizing and training workshops; and has offered hands-on training in hoop house management, post-harvest, and food handling training in a mini packhouse. Additionally, they offer support to small and medium food enterprises and supply produce to local food pantries and schools in AR. UAPB is an 1890 Land Grant HBCU/MSI that provides services to hundreds of farmers over 10,000 acres of land with a focus on SUP through its Small Farm Center in Southwest and Eastern Arkansas in various CSC areas: virus free sweet potato varieties, integrated pest management, risk assessment and mitigation strategies, and no till cover crops among others. EAEC partners provide conservation planning assistance to alternative crop producers and landowners in the Eastern Arkansas Delta including capacity building of SUP in partnership state organizations in the CSC focus areas of drip irrigation, raised bed plastic mulch, nutrient management with cover crops; promotion of community gardens in urban/rural towns; and CSC M&E, risk mitigation, and strategic planning.

II. A plan to pilot climate-smart agriculture and forestry practices on a large scale

A. A description of CSAF practices to be deployed:

Regional, national, and global problems of food insecurity and environmental impacts from industrial agriculture and climate change point to the immediate need for “smart crops” and improved CSC value chains that strengthen US urban and rural forests farms and ranches by reducing GHG emissions. In SoCal, we will pilot micro-farms in urban areas that can reduce water and electrical consumption and have massive GHG benefits when adopted throughout such dense cities. Con10u2Farm, 151 Farms, Mudd Farms, and additional partners will serve as a platform to further develop our curriculum in CSC urban farming for large scale distribution. The urban ag team will take advantage of new urban ag ordinances that avail agribusiness space along with tax incentive zones for vacant property owners. Such policy understanding and navigation will be shared with participating SUP. We anticipate trainees who participate in our CSC pilot program will secure external funding and expand small, vertical, innovative farms, in partner cities in the SE and other regions of the US. CSC work done in Imperial County, CA and at SHA will serve as a CSC blueprint for large-scale adoption of regenerative landscaping—especially in areas already severely affected by drought, fire, and persistent water shortages.

Such “CSC training toolkits” designed in these “climate-crisis” zones can be adopted in other dry, hot regions of the US in future grants and years. In the SE hub, SH will serve as a nexus for SUP farmers to engage in innovative CSC co-designed and developed with neighboring partners. We anticipate CSC techniques unique to SUP farmers in the region will be able to share and expand CSC practices, including soil health, low till practices, “smart crops”, on-site nutrient-based inputs, biofeed and biowaste management, and agroforestry, and that these practices will be applicable in neighboring states including OK, TX, FL, NC, SC, GA and others. SUP who join our virtual platform in any state will be able to access tools in CSC techniques to improve soil, agroforestry, and ecosystem health. They will also have access to CSC marketing and M&E developed through case studies as the project progresses. This will support the large-scale awareness and adoption potential to support SUP and early CSC adopters.

Training and implementation in both regional hubs will deploy CSC/CSAF practices as part of the pilot program with SUP and MSI interns for M&E. While regional emphasis of certain practices will exist depending on location, size of farm/ranch, needs-assessment results, all participants will receive training and engagement with the following CSC/CSAF practices:

Soil Health: Cover crops, low-till/no-till, nutrient management, enhanced efficiency fertilizer, on site nature-based inputs (NBI), soil amendments, vermicomposting, biochar; Maintaining and improving forest soil quality, urban “soil” solutions including hydroponics and aquaponic systems.

Plant/Tree Health: Planting “smart crops” for high carbon sequestration rate and low inputs; permaculture; agroforestry and afforestation on working lands;

afforestation/reforestation and sustainable forest management; Increase on-site carbon storage through forest stand management; increase on-site input production.

Ecosystem Health: Prescribed grazing or legume interseeding on pastures, Manure management; Fire management; Feed management to reduce enteric emissions; Buffers and grassland management, and tree planting on working lands

B. Plan to recruit producers/landowners, including estimated scale of the project:

We will recruit SUP through existing partnerships with community, farming, and agroforestry-based organizations. We will have two regional hubs where students, researchers, and SUP producers gather to codesign, train, monitor, and evaluate greenhouse gas benefits from implemented and experimental CSC. Each hub will link students from minority serving institutions (MSI) actively participating in CSC, STEM, computer science, entrepreneurship, urban agriculture, and innovation programs with SUP. We will leverage our UC-wide Center on Food Justice to recruit SUP and students with the UC system for our WC Hub, and from HBCU in the SE Hub through coordination and outreach by Dr. Gaidi Faraj. SUP from the East Arkansas Delta Regional Conservation Partnership Program, currently with 100 applicants, will be encouraged to join our CSC partnership in 2022/2023 and subsequent years. EAEC has served over 500 small underserved producers and is expected to encourage farmers and landowners to participate in this initiative. Future Farmers of America (FFA) chapters in St. Francis and Lee Counties, AR are working to restore and strengthen vocational agriculture programs for at-risk-youth who show interest in becoming farmers. They will also support recruitment of youth in our CSC program. Our partnership will leverage such existing networks to expand CSC training to a wider range of SUP well beyond our initial targeted beneficiaries. Through all inter-state partnerships, we will serve an estimated 330 farmers, 55 students directly, with each receipt of CSC training capacities anticipated to train at least 5 additional farmers in CSC practices, resulting in almost 2000 potential CSC benefits, and engagement across an estimated 10,500 acres of land in over 6 states.

C. Plan to provide technical assistance, outreach, and training, including who will be conducting these activities, and projected timeline

To facilitate technical assistance, outreach, and training, Dr. Waterman will act as the coordinator and lead for CSC SUP training and coordination of overall activities at both WC and SE hubs over the 5 years. She will attend and help conduct all WC focus group meetings, training, and provide MSI intern mentorship in at least 50% of SE activities; The **SE hub** will be run by SH; they will operate and manage SE regional training and outreach activities. Training will be accomplished with a team lead facilitator, Dr. Colley, and 2 facilitating coordinators from EACE and UAPB who will manage activities at on-site training farms in AR, MS, TN, LA. These partners will implement the Farmer Field School (FFS) and Training of Trainers (TOT) programs to support the adoption of CSC and field trial research with paraprofessional farmers connected to target SUP. The FFS is a participatory, interactive, problem solving and discovery-based learning program. SUP are given the opportunity to analyze their production system, identify challenges,

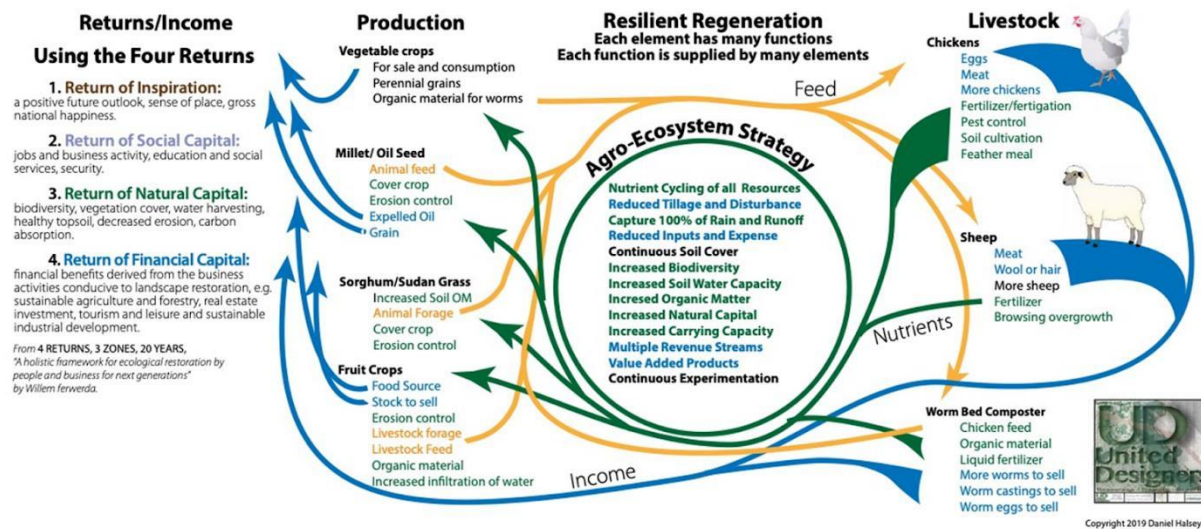


Figure 3. Training and Model Practices for Agro-Ecosystems Strategy

and test out CSC solutions for economic and environmental benefits over one production cycle per year. The **WC hub** will host training and outreach at SHA with a focus on agroforestry/ecological restoration following expert strategies developed and taught by Daniel Hasely (Fig 3). In SoCal where SUP, interns and MSI students will visit urban farms in San Diego and LA (151 Farms, Mudd Farms, etc) with training lead by James Brady of Con10u2farm, LLC; and in Imperial County, CA where Tony Lopez will provide training on his 2-acre farm from producing CSC crop including moringa– which can tolerate and thrive in high-heat, low- water, drought conditions; neighboring ranchers including Jesus Viesca; he is currently using moringa as a biofeed to increase the yield and dairy production of cows; reports . This has been reported in the literature and will be explored in this program. Jesus is eager to engage in CSC training and utilize his farm as a site for students to visit throughout the project period. Ted Radovich, based in HI has extensive experience with CSC, permaculture, and biodiversity and unique ecosystems. He will provide guidance and material content, along with review of CSC training materials, attend virtual meetings, and at least one in-person meeting/year in each regional hub.

Regional Hubs will use face-to-face and social media strategies to build awareness on the benefits of CSC and participatory interest amongst SUP. This initiative will create an incubator in their local economic, environmental, and social contexts, allowing farmers to engage, share, and synthesize their thinking to build relationships, foster partnerships, and participate in supply chains and market development. SUP trainees will be encouraged to work, learn and interact with our CSC hubs beyond the project life cycle and from season to season.

D. Proposed Timeline

2022	2023	2024	2025	2026
<p>CSC Focus Groups</p> <ul style="list-style-type: none"> •Link Smart-Crop Farms with MSI M&E institutions •Conduct Focus Group sessions on CSC needs •Establish, build-out CSC training sites and hubs •First round of CSC SUP MSI training 	<p>CSC Training MSI M&E</p> <ul style="list-style-type: none"> •Develop and Deliver CSC training •Conduct Research and LUS analysis •Utilize COMET and GHG tracking; develop Urban Climate-Smart ag and M&E tools 	<p>CSC Implementation & M&E</p> <ul style="list-style-type: none"> •Increase STEM and MIS engagement with GHG Benefits •Implement Climate-Smart Assessment tools with urban/rural farmers 	<p>CSC Impact & Expansion w M&E</p> <ul style="list-style-type: none"> •Increase #of producers and adopters of CSC with matched M&E from MSIs •Expand Training and Adoption of CSC 	<p>CSC Market Tools & Growth</p> <ul style="list-style-type: none"> •Develop Market Opportunities and Growth for CSC

E. Plan to provide financial assistance for producers/landowners to implement CSAF practices

In the SE Hub 250 SUP, 15 interns and 25 students will be trained in CSC and provided with financial assistance from the SH subaward. This will be allocated to provide 50 farmer/producer x \$500/ac x 2/ac per year with 2 rotations of farmer producer per year for five years over the life of the project. Each SUP will receive \$1000, while students and interns will receive \$4000 directly from SH and be eligible to travel to regional focus groups and cross-state training covered in the overall budget by UCD. In the WC hub a total of 80 SUP, and 15 interns will be provided with financial assistance at the same rates at the SH hub SHA will provide assistance for Y1-Y3, while SoCal sites will operate with overall funds for all five years. SUP may also attend training in different regional hubs than they reside if appropriate. All trainees will also receive financial literacy, grant writing, and CSC agribusiness planning. By the end of one year of participation successful trainees will be prepared to apply for their own financial assistance through additional USDA grants and/or private investment aimed at SUP and CSC value chains.

F. Plan to enroll underserved and small producers, including estimated number of underserved and small producers participating and associated dollar amounts anticipated to go directly to producers, in the form of technical and financial assistance.

As stated above a total of 330 SUP and 55 students/interns will be enrolled in our CSC training through existing partnerships with outreach organizations and research MSI on the ground in two regional hubs and through a global virtual network. Participation in training will average \$1000 to go directly to SUP. They will also receive a CSC toolkit, materials, and manuals estimated at a value of \$2500 each. Selected participants will also have the opportunity to apply and attend focus groups and annual meetings paid for through the overall grant funds. SUP MSI students and interns will receive technical assistance for training, logistics and coordination of projects. The CSC pilot program will

provide a sustained network to further receive additional technical and financial assistance through additional filing sources.

III. A measurement/quantification, monitoring, reporting, and verification plan

A. Approach to greenhouse gas benefit quantification, including methodology approach consistent with the section titled “Quantification Requirements” below,

CSC reporting and tracking tools will be implemented to monitor GHG benefits among participants. We will utilize the COMET tool primarily for larger scale farms and quantitative methods listed below. We will also utilize the [Food Emissions Calculator](#) (see Fig 4.) for SUP to input information about particular produce and calculate the emissions of the farming process. Experimental livestock methane emission models plan to be implemented in Y3. The Land Use Systems Analysis (LUSA) tool will be used for economic cost/benefit analysis. Overall farmers will be able to evaluate CSC for environmental and economic outcomes. We hope to see participants reduce GHG emissions by up to 50% and increase revenues by 25%.

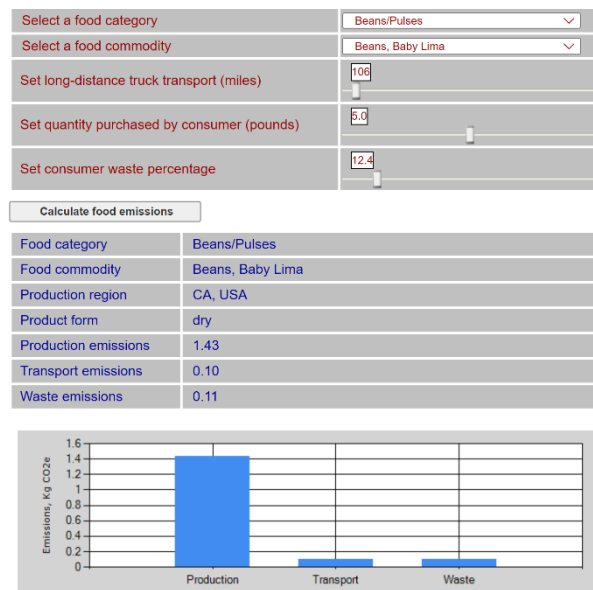


Figure 4. Food Emissions Calculator example for beans/pulses.

We acknowledge there are many limitations to measurement and methodology around GHG quantification in small, urban farms. Access to tools and processes to quantify benefits are still relatively infant in their design. Through academic and farmer/producer collaborations, we will construct new and adaptive approaches to research and expand on our methodologies, as well as the design of additional tools to quantify these processes. We will share and report new developments and both quantitative and qualitative findings during the Food Justice Center monthly meetings, which will allow cross-referencing and multidisciplinary collaboration to develop and enhance the methods of measurement. Bidirectional feedback will be pivotal in the innovative process. This project seeks to develop and inform future USDA practices and tools.

B. Approach to monitoring of practice implementation, including the anticipated number of farms and acres reached through project activities

We will monitor the practice of implementation by conducting regular site-visits, reviewing and discussing implementation methods, gauging participant completion of training programs; through the enrollment of interned students from MSIs in trainings and summer programs; regular reports produced by partners sharing findings, results, measurements, and processes; information collected at focus group meetings; LUSA

reports; reports on innovative approaches to measuring GHG; tracking revenue streams in farmers, number of customers; the number of adopted climate smart commodities; participation and engagement in monthly meetings; and grant acquisition and external funding acquired by farmers and MSIs as a result of this proposed project.

C. Approach to reporting and tracking of greenhouse gas benefits including the anticipated GHG benefits per farm, per project, per commodity produced, per dollar expended, and the anticipated longevity of GHG benefits

A variety of reporting and tracking tools will be implemented to monitor GHG benefits specific to CSC. These tools will also be included in the CSC training offered to producers and participants. They will be further adapted and developed by interns and students from collaborating MSI/HBCU institutions. Soil CSC are anticipated to increase soil fertility (soil testing), water retention (soil sensors, drone footage, runoff, rainfall); Plant/tree CSC are anticipated to increase carbon sequestration (estimated with COMET), plant biodiversity (count, drone footage), production of nutrient dense specialty crops (inputs, yield, sales, Food Emissions Calculation Tool).

The LUSA tool was developed by an International Agriculture Development faculty at UC Davis and utilized in Kenya with small holder and contracted farmers (Waterman, 2021). It measures and models the cost/benefit of a specific crop for SUP over a 12-year span. It enables farms to tweak and adjust model “knobs” to see how adapted CSC techniques can change costs. They can better, informed decisions about which CSC crops and technologies to adapt to reduce risk and increase economic performance. The dollar amount per commodity will be calculated and evaluated during the research and development stage to ensure accuracy and congruence. These figures will vary based on geographic location, product, and other related factors. Progress reports will be submitted bi-annually, in compliance with the USDA guidelines, as well as post-award reporting requirements of 2 CFR Part 170.

D. Approach to verification of greenhouse gas benefits

We will use the richness of our network and multidisciplinary partnership community to conduct checks and balances between the team and review predetermined metrics by university faculty, advisors, and cooperative extension services. We will also use this as an opportunity to engage students who have advanced through the training programs, allowing them to co-evaluate with a program mentor/facilitator. The verification process will be implemented annually, during years 2-5. Baseline measurements will initiate the collection process for comparative analysis. Measurable outcomes will be determined and adjusted to facilitate cause and effect on yields. Measurements of GHG and related organic management practices for the reduction of GHG emissions include:

- **Soil Testing:** pH, Soil Carbon, Organic Material, Microbial Content and species, Bulk Density, Water Holding Capacity, Plasticity, porosity, conductivity/salinity, available nutrients.
- **Leaf Testing:** Leaf Canopy Area, Species Diversity, Root Mass, Depth of Rooting Zone Drainage Culvert Rain Event Runoff (Duration, Volume, Velocity, Turbidity), Silt Trap Sediment, Seasonal and per calibrated rain event, Basin and pond levels, infiltration, overflow, seasonal metrics.

- **Weather Data:** Historical Comparisons, Air Quality, Rainfall, Duration, Frequency, Humidity, Dew Points, Wind, Temperature and Diurnal differences, Growing Degree Days, Heating and Cooling Degree Days, UV Exposure, Solar Insolation.
- **Wildlife/Livestock:** Pollinator and Bird Counts; animal health; yield of dairy and meat livestock; GHG emission reduction (methane) by livestock.

E. Agreement to participate in the Partnership Network

In compliance with the requirements of this grant, we agree to appoint a representative as a member of the USDA Partnerships for CSC Learning Network. The representative agrees to attend two virtual meetings and two in-person meetings per year throughout the project duration. The PI will actively participate in the synthesis of reports to the USDA on topics related to the implementation of the project.

IV. A plan to develop and expand markets for climate-smart commodities generated as a result of project activities

A. Any partnerships designed to market resulting climate-smart commodities

Our partners will collaborate to design a central, CSC market development strategy in Y3-Y5 based on our projects MSI-lead M&E. We will focus initially on demand analysis, supply/distribution, quality standard, certifications, and contract requirements for CSC based on local, regional, and national opportunities. The primary focus will be understanding key performance indicators for such products. SHA, Imperial Moringa, Urban LA farms, SH, and other partners will see increased sales and GHG benefits. Our virtual and in-person networks will exponentially increase CSC markets, reduce risk and GHG emissions. Various partners can leverage CSC crops and technologies in their marketing tools—Such as phone Apps that target local environmental and social equity needs. For example, its estimated ~40% of Black farmers in Southern States do not have access to reliable internet ([McKinsey & Co., 2021](#)); however we can model farmer-to-farmer texting services on non-smart phones in such regions—allowing SUP to connect directly. These methods have been utilized in parts of East Africa by the PI and team partners. We seek to find such appropriate technologies where needed. Our virtual hub will allow individuals and partners from various hubs to co-share and co-learn marketing CSC techniques and report on those successful, those in need of adaptation. SUP will have the opportunity to co-invest in the CSC value chain and circular economy to reduce risk, increase profits, and offset more GHG emissions

B. A plan to track climate-smart commodities through the supply chain, if appropriate

Tracking underserved farmer participation and products in the CSC supply chain is critical. Each year of the project, we will train SUP in CSC and begin to track their CSC (by product using the Food Emissions Calculator, and by technology in following years). This will be a strong focus of Y3-Y5 as the pilot project develops further and is able to provide better guidance and training related to CSC supply chain opportunities. As food hubs become the center for constructing and distributing shared values through aggregation and product differentiation among underserved farmers operating across multiple enterprise sectors within the local and regional food economy. It thrives on mutual network support with investors as stakeholders to maximize individual farm enterprise goals. The food hub evolves at the operational level into four interrelated

pillars: information, processes, knowledge, participatory review and evaluation. Sustainable food hub formation will be a critical success indicator of SUP participation in climate smart commodity supply chains. We will develop a phone App that connects growers with buyers at the local level and can be used on 2G or 5G networks.

C. Estimated economic benefits for participating producers including market returns

There will be significant estimated economic benefits for participating CSC producers. The project will directly benefit income generation for sub awardees, contracted partners, and trained producers through direct sales of CSCs (high value SCs), reduced costs of inputs, and increased capacity for further training operations and services. Since this is a pilot project, baseline data for market sales will be conducted for all partners, and included in part of the CSC training. By Years 3-5, we anticipate being able to report on exact environmental and economic costs and benefits for participants. We estimate to see >25% increase in sales and >50% reduction of GHG emissions and/or cost of operations.

D. Post-project potential, including anticipated availability to scale post project activities, likelihood of long-term viability beyond project period, and ability to inform future, USDA actions to encourage climate-smart commodities

This project is easily scalable and replicable and will offer a macroscale blueprint for long term sustainability and incorporation of CSC for rural and urban farmers, producers, ranchers, and foresters. By Y3 we anticipate receiving additional Federal funding to expand our CSC training to additional US states. By Y3, SHA will be sustainable and not rely on USDA funding, but will continue to serve as a training site in Y4 and Y5. Our projects co-developed at MSI with SUP will offer opportunities for extensive research, curriculum development, monitoring, evaluations, and reporting of results throughout the academic and farming communities to further inform the future of USDA actions and activities that encourage CSC. The core group of 330 SUP trained during this grant are expected to each train and transfer CSC skills to at least 5 additional SUP in the following years. Specifically, our long-term aims include:

- Positioning SHA, SH farm to acquire \$5 million in project-funding by year 3 (2024)
- Supporting SUP CSC trained recipients to acquire \$100-\$500 thousand in project funding within 1.5 years of completing their training
- Supporting farms to become independently sustainable
- Supporting interns post-project implementation and CSC career advancement
- Increasing revenue streams and Agtech transfer, enabling partners to be training facilities and learning site for future CSC work
- Offering of grant writing services, evaluations and business skills to support adaptation to on-going challenges and barriers
- Hosting a self-sustaining virtual hub through the existing UC GHI Food Justice network and website: www.globalfoodjusticecoe.org/

Through the culmination of diverse regional and site-specific training outreach and monitoring and evaluation we will increase the number of producers of CSC amongst SUP and engage with MSI for monitoring and evaluation of climate smart commodities within the value chain for market growth, business development, and Scalable climate-smart solutions.

References

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Waterman, Carrie, et al. "Assessing the economic viability of commercial moringa production for Kenyan small-scale farmers." *Journal of Agribusiness in Developing and Emerging Economies* (2021).

www.wri.org/insights/4-ways-farmers-can-adapt-climate-change-and-generate-income

Other Attachment File(s)

FileName	MimeType
FA_Rate_Agreement_June_20211035409898.pdf	application/pdf
Lead_Project_Administrator_Resume1035494634.pdf	application/pdf
Letters_of_Support_1035494639.pdf	application/pdf

COLLEGES AND UNIVERSITIES RATE AGREEMENT

EIN: 94-6036494

DATE:06/28/2021

ORGANIZATION:

FILING REF.: The preceding
agreement was dated
08/13/2019University of California (UCD)
Davis Campus

Davis, CA

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section III.

SECTION I: INDIRECT COST RATES

 RATE TYPES: FIXED FINAL PROV. (PROVISIONAL) PRED. (PREDETERMINED)

EFFECTIVE PERIOD

<u>TYPE</u>	<u>FROM</u>	<u>TO</u>	<u>RATE (%)</u>	<u>LOCATION</u>	<u>APPLICABLE TO</u>
FINAL	07/01/2018	06/30/2020	57.00	On-Campus	Organized Res.
PRED.	07/01/2020	06/30/2022	57.00	On-Campus	Organized Res.
PRED.	07/01/2022	06/30/2023	59.50	On-Campus	Organized Res.
PRED.	07/01/2023	06/30/2024	60.00	On-Campus	Organized Res.
PRED.	07/01/2024	06/30/2025	61.00	On-Campus	Organized Res.
FINAL	07/01/2018	06/30/2020	26.00	Off-Campus	Organized Res.
PRED.	07/01/2020	06/30/2025	26.00	Off-Campus	Organized Res.
FINAL	07/01/2018	06/30/2020	39.00	On-Campus	Other Spons Act
PRED.	07/01/2020	06/30/2022	39.00	On-Campus	Other Spons Act
PRED.	07/01/2022	06/30/2025	42.50	On-Campus	Other Spons Act
FINAL	07/01/2018	06/30/2020	25.00	Off-Campus	Other Spons Act
PRED.	07/01/2020	06/30/2022	25.00	Off-Campus	Other Spons Act
PRED.	07/01/2022	06/30/2025	26.00	Off-Campus	Other Spons Act
FINAL	07/01/2018	06/30/2020	50.00	On-Campus	Instruction
PRED.	07/01/2020	06/30/2025	50.00	On-Campus	Instruction
FINAL	07/01/2018	06/30/2020	26.00	Off-Campus	Instruction
PRED.	07/01/2020	06/30/2025	26.00	Off-Campus	Instruction
FINAL	07/01/2018	06/30/2020	22.70	Primate Ctr	Core Grant (1)
PRED.	07/01/2020	06/30/2022	22.70	Primate Ctr	Core Grant (1)

ORGANIZATION: University of California (UCD) Davis Campus

AGREEMENT DATE: 6/28/2021

<u>TYPE</u>	<u>FROM</u>	<u>TO</u>	<u>RATE (%)</u>	<u>LOCATION</u>	<u>APPLICABLE TO</u>
PRED.	07/01/2022	06/30/2025	25.20	Primate Ctr	Core Grant (1)
FINAL	07/01/2018	06/30/2020	54.40	Primate Ctr	Non-Core Fed(1)
PRED.	07/01/2020	06/30/2022	54.40	Primate Ctr	Non-Core Fed(1)
PRED.	07/01/2022	06/30/2025	57.80	Primate Ctr	Non-Core Fed(1)
FINAL	07/01/2018	06/30/2020	8.00	Off-Campus	IPA (2)
PRED.	07/01/2020	06/30/2022	8.00	Off-Campus	IPA (2)
PRED.	07/01/2022	06/30/2025	10.00	Off-Campus	IPA (2)
PROV.	07/01/2025	Until Amended			Use same rates and conditions as those cited for fiscal year ending June 30, 2025.

*BASE

Modified total direct costs, consisting of all direct salaries and wages, applicable fringe benefits, materials and supplies, services, travel and up to the first \$25,000 of each subaward (regardless of the period of performance of the subawards under the award). Modified total direct costs shall exclude equipment, capital expenditures, charges for patient care, rental costs, tuition remission, scholarships and fellowships, participant support costs and the portion of each subaward in excess of \$25,000. Other items may only be excluded when necessary to avoid a serious inequity in the distribution of indirect costs, and with the approval of the cognizant agency for indirect costs.

- (1) Primate Center - see Section II: Special Remarks.
(2) Intergovernmental Personnel Act Agreements.

ORGANIZATION: University of California (UCD) Davis Campus

AGREEMENT DATE: 6/28/2021

SECTION I: FRINGE BENEFIT RATES**

<u>TYPE</u>	<u>FROM</u>	<u>TO</u>	<u>RATE (%)</u>	<u>LOCATION</u>	<u>APPLICABLE TO</u>
FIXED	7/1/2020	6/30/2021	9.40 (1)		UCD (A)
FIXED	7/1/2020	6/30/2021	38.10 (1)		UCD (B)
FIXED	7/1/2020	6/30/2021	25.50 (1)		UCD (C)
FIXED	7/1/2020	6/30/2021	3.60 (1)		UCD (D)
FIXED	7/1/2020	6/30/2021	34.10 (1)		UCD (E)
FIXED	7/1/2020	6/30/2021	14.80 (1)		UCD (F)
FIXED	7/1/2020	6/30/2021	23.50 (1)		UCD (G)
FIXED	7/1/2020	6/30/2021	65.10 (1)		UCD (H)
FIXED	7/1/2020	6/30/2021	50.90 (1)		UCD (I)
FIXED	7/1/2020	6/30/2021	1.90 (1)		UCD (J)
FIXED	7/1/2020	6/30/2021	42.10 (2)		ANR (A)
FIXED	7/1/2020	6/30/2021	4.60 (2)		ANR (B)
FIXED	7/1/2020	6/30/2021	14.90 (2)		ANR (C)
FIXED	7/1/2020	6/30/2021	52.10 (2)		ANR (D)
FIXED	7/1/2020	6/30/2021	63.80 (2)		ANR (E)
FIXED	7/1/2020	6/30/2021	1.60 (2)		ANR (F)

ORGANIZATION: University of California (UCD) Davis Campus

AGREEMENT DATE: 6/28/2021

PROV. 7/1/2021 6/30/2022

Use same rates
and conditions
as those cited
for fiscal
year ending
June 30, 2021.

** DESCRIPTION OF FRINGE BENEFITS RATE BASE:

ORGANIZATION: University of California (UCD) Davis Campus

AGREEMENT DATE: 6/28/2021

Salaries and Wages excluding vacation and catastrophic leave.

(1) All UC Davis locations except for UC Davis Medical Center.

(2) UC Division of Agriculture and Natural Resources (ANR) activities at UC Davis locations.

UCD (A) Faculty Summer Salary.

UCD (B) Non-Healthcomp Faculty, Academic Appointments, Management and Senior Professional, and Safety Officers.

UCD (C) Healthcomp Faculty, School of Health Staff Physicians, and University Senior Management Group.

UCD (D) Employees not eligible for benefits.

UCD (E) Nurses, physician assistants and other campus physicians.

UCD (F) Employees eligible for partial benefits.

UCD (G) Postdoctoral employees.

UCD (H) Employees in the service bargaining unit.

UCD (I) Exempt and Non-Exempt Staff eligible for full benefits.

UCD (J) Student employees.

ANR (A) Employees with Academic Appointments or in Management & Senior Professional category eligible for full benefits.

ANR (B) Employees that are not eligible for full benefits, and Faculty and Academic Appointments eligible for Faculty Summer Salary working in the summer session.

ANR (C) Postdoctoral employees.

ANR (D) Exempt Staff eligible for full benefits.

ANR (E) Non-Exempt Staff eligible for full benefits.

ANR (F) Student employees.

ORGANIZATION: University of California (UCD) Davis Campus

AGREEMENT DATE: 6/28/2021

SECTION II: SPECIAL REMARKS

TREATMENT OF FRINGE BENEFITS:

TREATMENT OF FRINGE BENEFITS:

The fringe benefits are charged using the rate(s) listed in the Fringe Benefits Section of this Agreement. The following fringe benefits are included in the fringe benefit rate(s):

BENEFITS ADMINISTRATION, DENTAL BENEFITS, DISABILITY BENEFITS, EMPLOYEE SUPPORT PROGRAMS, FICA TAX, INCENTIVE AWARD PROGRAMS, LIFE INSURANCE, MEDICAL BENEFITS, RETIREE HEALTH BENEFITS, RETIREMENT BENEFITS, SENIOR MANAGEMENT SUPPLEMENT, UNEMPLOYMENT INSURANCE, VISION BENEFITS, WORKERS' COMPENSATION.

TREATMENT OF PAID ABSENCES

Vacation, holiday, sick leave pay & other paid absences are included in salaries & wages and are claimed on grants, contracts and other agreements as part of the normal costs for salaries & wages. Separate claims for the costs of these paid absences are not made.

DEFINITION OF EQUIPMENT

Equipment means tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost which equals or exceeds \$5,000.

DEFINITION OF ON-CAMPUS, OFF-CAMPUS AND SPECIAL RATES

DEFINITION OF OFF-CAMPUS RATE: The off-campus rate is applicable to those projects conducted at facilities not owned or leased by the University. However, if the project is conducted in leased space and lease costs are directly charged to the project, then the off-campus rate must be used.

PROJECTS CONDUCTED ENTIRELY ON-CAMPUS OR ENTIRELY OFF-CAMPUS: Projects conducted entirely on-campus or entirely off-campus will be applied the on-campus or off-campus rate respectively.

PROJECTS CONDUCTED PARTIALLY OFF-CAMPUS AND PARTIALLY ON-CAMPUS: If the project involves work at both on-campus and off-campus sites, either the on-campus or off-campus rate generally should be applied, consistent with where the majority of the work is to be performed. Salary cost is generally accepted as a measure of work performed in terms of the total project.

ORGANIZATION: University of California (UCD) Davis Campus

AGREEMENT DATE: 6/28/2021

USE OF BOTH ON-CAMPUS AND OFF-CAMPUS RATES: The use of both on-campus and off-campus rates for a given project may be justified if both of the respective rates can clearly be identified with a significant portion of salaries and wages of the project. For purposes of this provision, significant is defined as approximately 25% or more of the total costs and a project's total salary and wage costs exceed \$250,000.

OTHER SPECIAL RATES: These rates apply only to the facility or program to which they are identified. If any additional special rates become necessary the establishment of such rates should be coordinated through the cognizant negotiation agency.

PRIMATE CENTER RATES: The California National Primate Research Center (CNPRC) Non-Core Federal rate (57.8%) is applied only to the direct research costs of Federally sponsored awards excluding the National Center for Research Resources (NCRR) Core Grant. All recoveries from application of this rate represent University F&A expenditures allocated to the CNPRC (25.2%) and CNPRC-specific F&A expenditures (32.6%).

Additionally, the university has developed a Non-Federal CNPRC rate (90.1%) which is applied only to non-Federal research expenditures.

The Non-Core Federal and Non-Federal rates are considered additive to the Core Grant rate.

NEXT PROPOSAL DUE DATE

An F&A Costs Rates proposal based on actual costs for fiscal year ending 06/30/24, will be due no later than 12/31/24. A fringe benefit rate proposal based on actual costs for fiscal year ending 6/30/20, is currently under review.

ORGANIZATION: University of California (UCD) Davis Campus

AGREEMENT DATE: 6/28/2021

SECTION III: GENERAL

A. LIMITATIONS:

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted: such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. ACCOUNTING CHANGES:

This Agreement is based on the accounting system purported by the organization to be in effect during the Agreement period. Changes to the method of accounting for costs which affect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from facilities and administrative to direct. Failure to obtain approval may result in cost disallowances.

C. FIXED RATES:

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

D. USE BY OTHER FEDERAL AGENCIES:

The rates in this Agreement were approved in accordance with the authority in Title 2 of the Code of Federal Regulations, Part 200 (2 CFR 200), and should be applied to grants, contracts and other agreements covered by 2 CFR 200, subject to any limitations in A above. The organization may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

E. OTHER:

If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:

University of California (UCD) Davis Campus

INS DocuSigned by:

Peggy Arrivas
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(SIGNATURE)

Peggy Arrivas

(NAME)

Systemwide Controller

(TITLE)

6/29/2021

(DATE)

ON BEHALF OF THE FEDERAL GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES

(AGENCY)

Arif M. Karim -S Digitally signed by Arif M. Karim -S
Date: 2021.06.28 12:59:12 -05'00'

(SIGNATURE)

Arif Karim

(NAME)

Director, Cost Allocation Services

(TITLE)

6/28/2021

(DATE) 7006

HHS REPRESENTATIVE: Jeffrey Warren

Telephone: (415) 437-7820

**UNIVERSITY OF CALIFORNIA DAVIS
FACILITIES AND ADMINISTRATIVE COST RATES
FOR THE PERIOD JULY 1, 2018 THROUGH JUNE 30, 2025**

ORGANIZED RESEARCH				
	JULY 1, 2018 THROUGH JUNE 30, 2022	JULY 1, 2022 THROUGH JUNE 30, 2023	JULY 1, 2023 THROUGH JUNE 30, 2024	JULY 1, 2024 THROUGH JUNE 30, 2025
	ON-CAMPUS OFF-CAMPUS	ON-CAMPUS OFF-CAMPUS	ON-CAMPUS OFF-CAMPUS	ON-CAMPUS OFF-CAMPUS
BUILDING DEPRECIATION	5.90%	6.50%	6.70%	7.00%
EQUIPMENT	3.50%	3.40%	3.40%	3.40%
BUILDING INTEREST	4.80%	4.10%	4.10%	4.10%
OPERATIONS & MAINT	15.00%	17.30%	17.50%	18.20%
LIBRARY	1.80%	2.20%	2.30%	2.30%
GENERAL ADMIN	5.70%	5.20%	5.20%	5.20%
DEPT ADMIN	16.80%	17.00%	17.00%	17.00%
SPON PROJ ADMIN	3.50%	3.80%	3.80%	3.80%
STUDENT SERV ADMIN	0.00%	0.00%	0.00%	0.00%
ADMIN COMPONENTS	26.00%	26.00%	34.00%	26.00%
omp	57.00%	59.50%	60.00%	61.00%
	26.00%	26.00%	26.00%	26.00%

OTHER SPONSORED ACT				
	JULY 1, 2018 THROUGH JUNE 30, 2022	JULY 1, 2022 THROUGH JUNE 30, 2025	JULY 1, 2018 THROUGH JUNE 30, 2022	JULY 1, 2022 THROUGH JUNE 30, 2025
	ON-CAMPUS OFF-CAMPUS	ON-CAMPUS OFF-CAMPUS	ON-CAMPUS OFF-CAMPUS	ON-CAMPUS OFF-CAMPUS
BUILDING DEPRECIATION	2.70%	3.50%	4.50%	4.60%
EQUIPMENT	1.30%	1.70%	1.20%	1.50%
BUILDING INTEREST	1.30%	1.50%	2.50%	2.70%
OPERATIONS & MAINT	8.00%	8.70%	9.10%	11.00%
LIBRARY	0.70%	1.10%	6.70%	4.20%
GENERAL ADMIN	5.50%	5.60%	5.00%	5.00%
DEPT ADMIN	16.20%	16.70%	11.00%	11.00%
SPON PROJ ADMIN	3.30%	3.70%	2.10%	2.10%
STUDENT SERV ADMIN	0.00%	0.00%	7.90%	7.90%
ADMIN COMPONENTS	25.00%	26.00%	26.00%	26.00%
TOTAL	39.00%	42.50%	50.00%	50.00%
	25.00%	26.00%	26.00%	26.00%

Reflects provisions of Appendix III to Part 200 of Uniform Guidance—Indirect (F&A) Costs Identification and Assignment, and Rate Determination for Institutions of Higher Education (IHEs), C.8. dated December 26, 2013.

**UNIVERSITY OF CALIFORNIA DAVIS
FACILITIES AND ADMINISTRATIVE COST RATES
FOR THE PERIOD JULY 1, 2018 THROUGH JUNE 30, 2025**

	PRIMATE CENTER JULY 1, 2018 THROUGH JUNE 30, 2022		PRIMATE CENTER JULY 1, 2022 THROUGH JUNE 30, 2025		INTER-GOV PERSONNEL ACT JULY 1, 2018 THROUGH JUNE 30, 2022		INTER-GOV PERSONNEL ACT JULY 1, 2022 THROUGH JUNE 30, 2025	
	CORE GRANT	NON-CORE FED	CORE GRANT	NON-CORE FED	OFF-CAMPUS		OFF-CAMPUS	
BUILDING DEPRECIATION	2.10%	3.60%	2.70%	3.80%	0.00%		0.00%	
EQUIPMENT	0.90%	2.00%	1.60%	2.20%	0.00%		0.00%	
BUILDING INTEREST	0.20%	0.20%	0.70%	0.70%	0.00%		0.00%	
OPERATIONS & MAINT	8.80%	22.90%	9.20%	25.10%	0.00%		0.00%	
LIBRARY	0.50%	0.50%	0.50%	0.50%	0.00%		0.00%	
GENERAL ADMIN	6.20%	6.20%	5.40%	5.40%	4.50%		5.40%	
DEPT ADMIN	0.00%	15.00%	0.00%	15.00%	0.00%		0.00%	
SPON PROJ ADMIN	4.00%	4.00%	5.10%	5.10%	3.50%		4.60%	
STUDENT SERV ADMIN	0.00%	0.00%	0.00%	0.00%	0.00%		0.00%	
TOTAL	22.70%	54.40%	25.20%	57.80%	8.00%		10.00%	

Reflects provisions of Appendix III to Part 200 of Uniform Guidance—Indirect (F&A) Costs Identification and Assignment, and Rate Determination for Institutions of Higher Education (IHEs), C.8. dated December 26, 2013.

DocuSigned by:


Nathan Brostrom
737CDEDE80E544B...
(SIGNATURE)

EVP – CFO

TITLE

7/1/2021

DATE

Carrie Waterman, Ph.D.

Email: cwaterman@ucdavis.edu

Phone: (916) 516-0320

Website: carriewaterman.org

EDUCATION

Aug 2005-July 2010 University of the Sciences Philadelphia, PA

Ph.D. Pharmacognosy (Natural Products Chemistry)

- Doctoral Thesis: Activity Based Isolation of Phenolic Compounds in *Anogeissus leiocarpus* & Improved Bioassay Verification of African Ethnobotanical Anthelmintics.
- Coursework: Pharmacognosy, Biochemistry, Analytical Chemistry, Plant Biology (GPA 4.0).
- Teaching Assistant: General Biology laboratory & Graduate Pharmacognosy instructor.

Aug 1997-Dec 2001 Humboldt State University Arcata, CA

B.S. General Biology & Science Education

- Research: Heavy metal phytoremediation with cultivated mustard plants (*Brassica juncea*).
- Coursework: Botany, Ecology, Microbiology, Cell Biology, Plant Physiology, Horticulture, Appropriate Technology, Pedagogy, Classroom Observation/Assessment, and Science Education.
- Teaching Assistant: Genetics Supplemental Course.

EXPERIENCE

Nov 2020-Present UC Davis Institute for Global Nutrition Davis, CA

Assistant Professional Researcher – USDA CA Dept. of Food & Agriculture Specialty Crop Block Grant

- PI on state-wide project to promote *Moringa oleifera* (moringa) as a sustainable food crop for improved nutrition, health, and food security in historically underserved communities through training and extension.
- Conducted 80 virtual and in-person moringa training and outreach activities with >10000 California residents on Awareness, Cultivation & Consumption, and Processing & Preservation of moringa to increase knowledge, utilization, income generation, climate change mitigation, and equitable food systems.
- Promoted consumption of moringa as a healthy vegetable & assessing knowledge gained, taste preferences, and production/consumption of moringa by quantitative/qualitative means using surveys and a VeggieMeter.
- Disseminated resources and information through farmer-to-farmer networks, social media, and in person meetings at universities, women's shelters, farms, community clinics, and youth organizations.
- Facilitated participatory collaborations, capacity building with faculty from UC Berkeley, UCANR Tulare, UCLA, and community advocates for food justice and health equity in CA.
- Developed website (camoringa.org) with resources and support for the general public and moringa growers.
- Established partnership with UC Davis student farm to cultivate moringa and provide it as a nutrient-rich vegetable in their CSA boxes along with recipes and information.
- Collaborated with CommuniCare, a Yolo County free health clinic for underserved communities with an onsite food and medicine garden, to conduct outreach for staff and patients on moringa benefits include taste testes and planning for potential moringa intervention studies at the center.
- Provided Moringa Ambassador training for six new and beginning farmers from underrepresented communities as experts to expand moringa extension services in their local regions. Training involved nutrition, permaculture, vermiculture, soil biology, climate-smart production and processing, marketing and urban farming.
- Awarded UC Global Health Institute grant for Center on Food Justice & Health Equity. Delivered over 20 hours of content to over 300 viewers with over 20 guests and built out virtual hub (globalfoodjusticecoe.org).

Feb 2020 USAID & Catholic Relief Services Gulu, Uganda

USAID Farmer to Farmer Volunteer

- Conducted technology transfer assistance for organic integrated pest management for moringa tree plantations.
- Assessed current pest infestation. Designed and trained farmers on organic remedies to curb infestations.
- Developed online learning tools for future farmer trainings and capacity building in rural communities.

Aug 2015-July 2020

(UCD) Dept of Nutrition & World Agroforestry Centre

Davis, CA & Nairobi, Kenya

Assistant Professional Researcher - NIH Fogarty International K01 Recipient

- Coordinated interdisciplinary research projects and capacity building on *Moringa oleifera* (moringa) for improved nutrition, health, agriculture, and income generation in partnership with farmers and organizations.
 - Training community leaders, farmers, and students (~400 total) in cultivation best practices, uses, pest management, and processing of moringa in Kenya, Tanzania, Rwanda, and Uganda.
 - Performing research optimization trials for: density, location, variety, and harvest time of moringa.
 - Leading “willingness to adopt” and nutritional impact studies with local and international partners.
 - Coordinating projects on applications of moringa for animal feed and biopesticide/fertilizer uses.
- Developed sustainable manufacturing practices for maximum nutritional & phytochemical content for moringa in collaboration with UCD & World Agroforestry Centre for local and international market expansion.
 - Conducted Land Use Systems analysis on small holder moringa production in Meru, Kenya.
 - Lead capacity building, feasibility, & expansion of moringa in local, regional, and international markets.
- Evaluated moringa extracts to treat chronic inflammation associated with metabolic syndrome.
 - Demonstrated in vitro and in vivo anti-inflammatory activity of moringa leaf and seed extracts.
 - Found isothiocyanate-rich moringa seed extract delayed the onset of Type 2 Diabetes in rat models.
 - Conducted nutritional/health clinical intervention study for communities.
- Leveraged collaborations in East Africa with UCD Global Affairs for Regional Faculty, Seed and SDG Grants.
 - Trained and mentored students in the Rx One Health Project in Rwanda.
 - Delivered Nutrition-sensitive agriculture and Entrepreneurship workshops at the African Leadership University (ALU) in Rwanda & Mauritius.
 - Designing and adapting the UCD Entrepreneurship Academy into an online remote training program for Global Challenge students at ALU on African Entrepreneurship that addresses the SDGs.
- Completed yearlong UCD Business Development Fellows program.
- Mentored, taught, and collaborated with undergraduate and graduate students from UCD, multiple institutions in Kenya, and ALU on research, career development, and business design.
- Provided lectures and support to Mandela Washington Fellows and UCD Global Disease Biology students.

Aug 2014-Aug 2015

Bayer CropScience – Biologics

West Sacramento, CA

Scientist II – Natural Products Chemistry

- Lead and managed technical team for Serenade® (*Bacillus subtilis* based fungicide/bactericide) product; organized & developed critical path initiatives for improved design and mechanistic understanding.
- Performed laboratory research on chemical isolation and plant response experiments.
- Fostered coordination between plant physiology, agricultural development, and marketing departments.
- Co-authored two patent applications on biopesticides (**US 2015/0344905 A1** & **WO 2015/184170 A1**).
- Completed Project Management training and developed business strategy skills.
- Fostered career internships for UCD students and coordinated guest lectures by UCD Plant Pathology faculty.

Aug 2012-Aug 2014

Rutgers University

New Brunswick, NJ

NIH T32 Postdoctoral Fellow - Plants and Health

- Participated in the NIH T32 research and training program on foods and plants to treat metabolic syndrome.
- Principal investigator & project coordinator for moringa research, product development & applications.
 - Implemented isolation and quantification of bioactives for improved quality control.
 - Performed in vitro and in vivo studies on the effect of moringa extracts on inflammation and diabetes.
 - Conducted rtPCR analysis on changes in the gut microbiome induced from consumption of phytoactives.
 - Co-inventor on patent for moringa extraction processing & production (**WO 2015066339 A1**).
- Trained, mentored, and coordinated research projects for several undergraduate, graduate and visiting fellows.
- Developed and taught *Applied Botanicals*, a 13 lecture online/remote course series to bio-medical researchers.

Sept 2011-July 2012 University of Nairobi Nairobi, Kenya

U.S. Fulbright Scholar- Research & Teaching- Plant Science

- Designed & instructed Plant Biochemistry, Plant Physiology, & Plant Structure & Function courses with 100-250 students. Integrated principals of universal design to meet various learning styles, languages, and local context.
- Mentored and advised graduate students in research strategy and implementation.
- Launched a CRDA between UON & Walter Reed/KEMRI for joint work on antimalarial plant research.
- Trained at the Kenyan Forestry Research Institute (KEFRI) on biodiversity, seed storage, promotion, & preservation of indigenous trees, crops, and vegetables.
- Wrote collaborative NSF, BMG, and USAID grants with Kenyan organizations & universities.

Sept 2010-Sept 2011 University of South Florida Tampa, FL

Postdoctoral Scholar - Natural Products Chemistry

- Identified & isolated antimalarial compounds from soil bacteria, fungi, and marine organisms.
 - Managed a team of undergraduate and graduate researchers in high-throughput fungal extraction (60,000 samples), solid deposition, bioassay plate preparation, data entry, & project organization.
- Coordinated state-wide consortium on the detection, prevention and treatment of vector borne diseases.
 - Communicated and incentivized involvement with stakeholders from the public and private sectors.

Aug 2005-July 2010 University of the Sciences Philadelphia, PA

University Instructor- General Biology

- Instructed General Biology labs 20 hours per week. Developed lectures and performed animal dissections.
- Adapted an anthelmintic bioassay based on doctoral research for integration in general biology lab instruction. Students evaluated the anthelmintic bioactivity of garlic, onions, and other medicinal foods (~300 students).
- Lectured & contributed to Pharmacognosy, Nutrition, & Economic Botany courses (~40 students).

July 2002-July 2004 United States Peace Corps Ker Pateh, The Gambia

US Peace Corps Volunteer - Education

- Taught 9th grade science & math to classes of 60 students.
- Organized & led workshops on the nutritional and agricultural uses of local medicinal and useful plants.
- Trained teachers & students in forestry techniques & integrated pest management.
- Researched traditional medical practices including interviews & visits to holistic treatment centers.
- Collaborated with Department of Forestry's director & 35 regional workers to compile countrywide data.
- Worked with Department of Health on WHO/UNICEF sponsored project aimed at standardizing & bridging traditional healing practices with modern hospital treatment.

GRANTS & AWARDS

UC Global Health Institute Pilot Center of Expertise on Food Justice & Health Equity – UC GHI: 2021-2022

- PI awarded of \$10K to develop and host an interactive virtual webinar series with farmers, healthcare workers, academic researchers, and diverse community activists to decolonize food systems and restore justice.

CDFA Specialty Crop Block Grant Program (SCBG) – UC Davis: 2020- 2023

- PI awarded of \$446K to promote sustainable production and consumption of moringa in California for improved health and nutrition particularly in underserved communities.

Sustainable Development Goals (SDG) Grant – UC Davis Global Affairs: 2020-2021

- PI awarded \$7.5K to train students and develop programs in African Entrepreneurship to address SDGs.

Seed Grant – UC Davis Global Affairs: 2018-2020

- PI awarded \$30K to improve moringa processing and global network of stakeholders in East Africa.

Africa Regional Faculty Grant – UC Davis Global Affairs: 2017-2018

- PI awarded \$5K for Rx One Health strategies using moringa to improve animal & human health in Rwanda.

NIH K01 - International Research Scientist Development Award – UC Davis/ICRAF: 2015-2020

- PI awarded \$745K to support career development and moringa research for 5 years in US & Kenya.

NIH Botanical Research Center Grant – Rutgers University/Pennington Biomedical Research Center 2015-2020

- Authored and contributed to \$5M award on botanicals to treat metabolic syndrome.

NIH Small Business Innovation Research Grant (SBIR) - Nutrasorb™ & Rutgers University: 2015-2016

- PI and author to \$200K of funding for moringa product development to treat IBD.
- NIH NCCAM Botanical Research Center Pilot Grant** - Rutgers University: 2013-2014
- PI with \$35K of funding for research on the use of moringa in the treatment of diabetes.
- Glasser Pre-doctoral Fellowship** - University of the Sciences: 2008-2009
- American Society of Pharmacognosy Travel Grant**: 2008
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CONSULTANCIES

- Founder for **Waterman & Company, LLC.** providing consulting/support to public and private researchers, institutions, and companies in the fields of health, nutrition, and agriculture to achieve improved and sustainable economic, environmental, social, and health outcomes. Feb 2021-Present. Sacramento, CA.
 - Nutritional consultant for Cultural Practice, LLC to produce virtual nutritional sensitization training for the **Innovation Lab for Crop Improvement** at Cornell University. Oct 2020-Present.
 - Scientific editor and consultant for *HerbalGram*, **American Botanical Council**, articles. Sept 2014 – Present.
 - Scientific consultant for US and global health, food, and nutritional supplement companies: **Kuli Kuli, Live Love Well, Smakwa, and Botanic Treasures**. Nov 2016 – Present.
 - Visiting professor and mentor for students and faculty at **ALU** in Mauritius & Rwanda. 2018- Present.
 - Independent nutrition and wellness consultant for executives at **PricewaterhouseCoopers (PwC)**. May 2018.
 - Advisor and trainer for **Fogarty International** Training & Development PhD students. 2015, Tajikistan.
-

PROFESSIONAL DEVELOPMENT

- **UCD Business Development Fellows**, Graduate School of Management. Completed five business classes, received mentorship and real-world business experience. Resulted in broader professional network within California and globally around the sustainable food and agriculture industry. Davis, CA 2016-2017.
 - Food security monitoring and evaluation training. Feb 2018. Nairobi, Kenya
 - Yoga teacher training 200-hour certification. Sacramento, CA.
 - Women's leadership & professional development program. 2013, Rutgers, New Jersey.
 - Swahili language training. 2012 and 2018-Present, Nairobi, Kenya.
 - Certified in animal care for proper use of laboratory animals. 2012, Rutgers, New Jersey.
 - NMR Superuser training and biosafety level 2 certification. 2011 University of South Florida.
 - HPLC and LCMS training by Shimadzu. Fall 2007. University of the Sciences, Pennsylvania.
 - Maya traditional medicine certification - Cornerstone Foundation. 2002, Belize.
 - Agricultural sustainability training. 2001, Cuba.
-

PUBLICATIONS

- 1) Chang J, Marczuk-Rojas JP, **Waterman C**, Garcia-Llanos A, Chen S, Ma X, Hulse-Kemp A, Van Deynze A, Van de Peer Y, Carretero-Paulet L. Chromosome-scale Assembly of *Moringa oleifera* Genome Uncovers Polyploid History & Evolution of Secondary Metabolism Pathways Through Tandem Duplication. *The Plant Genome*, **May 2022**.
- 2) Cantwell M, **Waterman C**. 2021. [Postharvest biology of fresh *Moringa oleifera* leaves](#). *V Acta Horticulturae* 1340.
- 3) Brar S, Haugh C, Robertson N, Owuor PM, **Waterman C**, George J, Fuchs III GJ, Attia SL. **2022**. [The impact of *Moringa oleifera* leaf supplementation on human and animal nutrition, growth, and milk production: A systematic review](#). *Phytotherapy Research* 36.4: 1600-1615.
- 4) **Waterman C**, Peterson A, Schelle C, Vosti S. **2021**. [Economic viability of commercial moringa production for Kenyan small-scale farmers](#). *Journal of Agribusiness in Developing and Emerging Economies*, Jan 7.
- 5) Islam, MA, Sheikh, A, **Waterman C**, Hosenuzzaman, M. **2020**. [Morphology, pod yield, and nutritional quality of two cultivars of moringa \(*Moringa oleifera*\) in Bangladesh](#). *Indian Journal of Science &Tech*, 13, 3725-3735.
- 6) **Waterman C**, Fahey J, Olson M. **2020**. [A Review of Scientific Results on Uses of Moringa-based Leaf Products](#). *Acta Horticulturae*, 1306, 121-134.
- 7) **Waterman C**, Castro RP. **2020**. [Perspectives on Regulatory Status of Moringa Products and Unwarranted Health Claims](#). *Acta Horticulturae*, 1306, 163-170.
- 8) **Waterman C**, Graham JL, Arnold C, Stanhope KL, Tong JH, Havel, PJ. 2020. [Moringa isothiocyanate-rich seed extract delays the onset of diabetes in UC Davis type-2 diabetes mellitus rats](#). *Scientific Reports*, 10.1, 1-7.

- 9) Wolff K, Jaja-Chimedza A, Kim Y, **Waterman C**, Poulev A, Raskin I, Ribnicky D. **2020**. [Moringa isothiocyanate-1 is bioaccessible and bioavailable as a stable unmodified compound](#). *Phytochemistry Letters*, 33, 33-38.
- 10) Kim Y, Wu AG, Jaja-Chimedza A, Graf BL, **Waterman C**, Verzi MP, Raskin I. **2017**. [Isothiocyanate-enriched moringa seed extract alleviates ulcerative colitis symptoms in mice](#). *PloS One*, 12(9), e0184709.
- 11) **Waterman C**, Calcul L, Beau J, Ma WS, Lebar MD, von Salm JL, Harter C, Mutka T, Morton LC, Maignan P, Barisic B, von Olphen A, Kyle DE, Vrijmoed L, Pang K, Pearce C, Baker B. **2016**. [Miniaturized cultivation of microbiota for antimalarial drug discovery](#). *Medical Research Reviews*, 36.1, 144-168.
- 12) **Waterman C**, Patel Z, Kim S, Rivera A, Pontiggia L, Grace MH, Smith R. **2015**. [Anthelmintic activity of punicalagin from *Anogeissus leiocarpus*](#). *Universal Journal of Plant Science*, 4, 67-71.
- 13) Tumer TB, Rojas-Silva P, Poulev A, Raskin I, **Waterman C**. **2015**. [Direct and indirect antioxidant activity of polyphenol and isothiocyanate-enriched fractions from *Moringa oleifera*](#). *Journal of Agricultural & Food Chemistry*, 63, 1505–1513.
- 14) **Waterman C**, Rojas-Silva P, Tumer TB, Kuhn P, Richard AJ, et al. **2014**. [Isothiocyanates from *Moringa oleifera* reduce weight gain, insulin resistance and hepatic gluconeogenesis in mice](#). *Molecular Nutrition & Food Research*, 59, 1013–1024.
- 15) Cheng DM, Raskin I, **Waterman C**, Tumer TB. **2014**. [Moringa leaf phytochemicals for skin benefits](#). *Cosmetics & Toiletries*.
- 16) **Waterman C**, Cheng DM, Rojas-Silva P, Poulev A, Dreifus J, Lila MA, Raskin, I. **2014**. [Stable, water extractable isothiocyanates from *Moringa oleifera* leaves mediate inflammation in vitro](#). *Phytochemistry*. 103, 114.
- 17) Cheng DM, Pogrebnyak N, Poulev A, **Waterman C**, Rojas-Silva P, Johnson W, Raskin I. **2014**. [Polyphenol-rich Rutgers scarlet lettuce improves glucose metabolism and liver lipid accumulation in diet induced obese C57BL/6 mice](#). *Nutrition*, 30, S52.
- 18) **Waterman C**, Calcul L, Mutka T, Kyle DE, Baker B. **2014**. [A potent antimalarial trichothecene from hyphomycete species](#). *Tetrahedron Letters*, 55,3989.
- 19) Calcul L, **Waterman C**, Ma WS, Lebar M, Harter C, et al. **2013**. [Screening mangrove endophytic fungi for antimalarial natural products](#). *Marine Drugs*, 11, 5036.
- 20) **Waterman C**, Smith RA, Pontiggia L, DerMarderosian A. **2010**. [Anthelmintic screening of Sub-Saharan African plants used in traditional medicine](#). *Journal of Ethnopharmacology*, 127, 755.
- 21) Smith RA, Pontiggia L, **Waterman C**, Lichtenwalner M. **2010**. [Introducing experimental design by evaluating efficacy of herbal remedies \(Do herbal remedies really work?\)](#). *Journal of Biological Education*, 44, 175.
- 22) Tabarez C, **Waterman C**, Rapp AL, Moyna P, Moyna G. **2009**. [Synthesis of novel indenoquinolines & indenopyridazines via photoisomerization of benzotropolone derivatives](#). *Tetrahedron Letters*, 50, 7128.
- 23) Smith R, Pontiggia L, **Waterman C**, Lichtenwalner M, Wasserman J. **2009**. [Comparison of motility, recovery, & methyl-thiazolyl-tetrazolium reduction assays for use in screening plants for anthelmintic activity](#). *Parasitology Research*, 105, 1339.

INTERVIEWS, ARTICLES, & MEDIA

- Authored [The moringa tree enters the arsenal of treatments against chronic inflammation](#), *The Conversation*. Received over 250,000 views; reposted in Newspapers, *World Economic Forum*, and media outlets, Oct, 2017.
 - Interviewed and featured in the following media articles.
 - [Scientist studies the moringa plant's medicinal, nutritional benefits](#). *Global Health Matters*, 2020.
 - [Moringa taking root in US as new superfood](#). *CBS National News*, 2019.
 - [Moringa the next superfood](#). *Washington Post*, 2018.
 - [The health benefits of moringa – 2018's superfood](#). *Iheart Radio Sacramento*, 2018.
 - [The growing potential for moringa](#). *The Aggie*, 2018.
 - [Planting a Seed: What collaborative moringa research looks like on the ground](#). *UC Davis Global Affairs*, 2018.
 - [Moringa's health benefits in lowering inflammation](#). *Huffington Post*, 2017.
-

Con10u2Farm L³C

21st Century

AgTech Consulting for a Healthy Community

June 6, 2022

Carrie Waterman, Ph.D.
Assistant Professional Researcher
Institute for Global Nutrition
Dept of Nutrition, UC Davis
Davis, California 95616
(916) 516-0320

Dear Dr. Waterman,

Con10u2FarmL3c, is fully supportive of this magnificent project titled "**Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers**", led by the University of California, Davis in collaboration with Grambling State University and University of Arkansas at Pine Bluff. At Con10u2FarmL3c, our mission is to have moringa as a staple crop throughout America through awareness and promotion of the Tree of Life! We accomplish this using social media, zoom meetings, and cross-cultural platforms such as Facebook, LinkedIn, pod casting, blogging, Twitter and word of mouth. We are currently working with Alabama State University on growing Moringa indoors and with growers in Fresno County under the leadership of Dr. Dahlquist Willard.

The proposed efforts are aligned with our mission to advance specialty crop research, education, and affect federal policies that bring more farmers and acreage into moringa cultivation. The project will provide moringa growers, processors, buyers, and other industry stakeholders the opportunity to identify and prioritize research and extension needs throughout the value chain of moringa production and sales. We are bringing researchers and stakeholders together to plan future efforts in support of U.S. Moringa Production. I shared my experience as a speaker at the "International Webinar on Moringa-A Superfood-Boon to Mankind" October 5, 2020, from India's TANIJ School of Horticulture. The project team represents various sectors of an emerging industry including community-based organizations, innovators and accelerators in moringa production technology and university research extension professionals, to include addressing new aspects of moringa leaf production, marketing for human consumption, animal fodder, foliar spray and bio-fertilizer.

Con10u2farm supports the plans outlined in this proposal and will surely contribute to the extensive network towards disseminating the outcomes and findings of the project to local and national food sector stakeholders. Additionally, I agree to be a partner, leveraging my experience and areas of expertise to guide this project. I am looking forward to working with you.

Thank you for taking the lead on this multi-state effort. Our working together will accelerate the growth and viability of a national and international Moringa industry by addressing barriers to entry, production, marketing, innovation, and new uses of moringa along with carbon sequestration.

Sincerely,
James Brady



2701 Del Paso Road, Suite 124 Phone:
www.con10u2farm.com

916-285-

5142 Sacramento, CA 95835

EAST ARKANSAS ENTERPRISE COMMUNITY (EAEC), INC

1000 AIRPORT ROAD - POST OFFICE BOX 2212 Telephone #: (870) 630-2005

FORREST CITY, ARKANSAS 72336-2212 Fax#: (870) 630-2035

E-mail Address: eaec@sbcglobal.net

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May 24, 2022

Dr. Barry J. Colley
CEO Seven Harvest, Inc.
393 SFC 320
Forrest City, AR 72335

Re: Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small & Underserved Producers

Dear Dr. Barry Colley,

The East Arkansas Enterprise Community, Inc (EAEC), a 501c3 Non-profit, will disseminate information that supports the recruitment of SDFRs during the 5 years of project implementation. Our efforts will be undertaken with the steadfast goal of SDFRs adopting climate smart production and management strategies to supply farm and forestry commodities in the emerging and anticipated climate smart marketplace.

We wholly support the full participation of SDFRs in climate smart and regenerative farming whereby they adopt a set of useful best practices that are affordable, contribute to high yields and provide a useful set of tools for climate mitigation and resilience and enables significant returns on investment with their crop, livestock and forestry enterprises. EAEC expects this project's innovative related instruction and modeling on climate change to build interest and understanding for a new generation of climate change practitioners to emerge in the communities of SDFRs.

We are grateful for the opportunity to serve in this critically important pilot project.

Sincerely,


Dr. Robert L. Cole, Director

Equal Opportunity

East Arkansas Enterprise Community, Inc. is an equal opportunity employer that is committed to diversity and inclusion in the workplace. We prohibit discrimination and harassment of any kind based on race, color, sex, religion, sexual orientation, national origin, disability, genetic information, pregnancy, or any other protected characteristic as outlined by federal, state, or local laws. This policy applies to all employment practices within our organization, including hiring, recruiting, promotion, termination, layoff, recall, leave of absence, compensation, benefits, training, and apprenticeship. East Arkansas Enterprise Community, Inc. makes hiring decisions based solely on qualifications, merit, and business needs at the time.



June 6, 2022

Funding Opportunity Number: USDA-NRCS-COMM-22-NOFO0001139

Re: Support for USDA Partnerships for Climate-Smart Commodities Initiative

Dear Dr. Carrie Waterman,

I, Gaidi Faraj, of Grambling State University, am writing to express support for our application for funding from the **USDA Partnerships for Climate-Smart Commodities initiative**. Our project, entitled, ***Piloting a Climate-Smart Commodity Chain & Research Network to Improve Environmental & Economic Outcomes for Small & Underserved Producers***, is partnering with multiple farming entities to form strategic, impactful projects on Climate-Smart Commodities (CSC) with underserved producers in both the southeast and west coast regions of the United States. This project will cultivate innovative, climate-smart crops and technologies and promote farmer equity, access, and resources to traditionally marginalized farmers.

This collaborative project will provide on-site training around climate-smart commodities and will host two regional hubs where students, researchers, and small farm producers gather, codesign, train, monitor, and evaluate greenhouse gas benefits from implemented and experimented CSC. The culmination of this project will establish a replicable blueprint for new and existing producers to evaluate their farms in urban and rural settings across the US with new and existing tools designed, modified, and optimized during the program. This project is designed to lay the groundwork for future, innovative, climate-smart work.

This project is important to me because of my experience and role working in the field of global challenges and their relationship to the UN Sustainability Goals. I have been working with Dr. Waterman and by extension, UC Davis, for the past 5 years. In my previous role we worked

together to address SDGs through student engagement in Mauritius and Rwanda. We have built upon that experience to think about how to apply innovative solutions to food justice issues in the United States, and particularly in underserved communities. I will be involved in this project from two angles. Firstly, as someone who has worked and has a base in both California and the southern states, I am well positioned to help recruit farming communities into our programming. Additionally, I will assist in designing and coordinating our system of monitoring and evaluating the program participants for alignment and achievement of the program objectives. I will recruit students and faculty from my university and other HBCUs in the impacted states to source our M&E team. Your support will enable us to observe, pilot, and expand existing and new innovative approaches to strategic, impactful projects on Climate-Smart Commodities (CSC) with underserved producers in both the southeast and west coast regions of the United States.

I have worked with Dr. Waterman in the past on issues of global challenges and food justice, and I am confident that she will deliver as promised.

I am available at **916-270-4243** to answer any questions you may have.

Regards,

A handwritten signature in cursive script, appearing to read "Gaidi Faraj".

Gaidi Faraj
Assistant Professor
Department of History
farajg@gram.edu

Imperial Moringa

1945 Chambers Lane
Holtsville, CA 92250

June 9, 2022

Re: Support for USDA Partnerships for Climate-Smart Commodities Initiative; Piloting a Climate Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small Underserved Producers

Dear Dr. Carrie Waterman,

I, Tony Lopez of Imperial Moringa am writing this to show my support for funding for the USDA Partnerships for Climate-Smart Commodities Initiative. This project that I would be honored to be a part of can have a huge impact on the farming community here in Imperial County.

This region is one of the hottest inhabited areas in the world and with water shortages the farming community is facing challenging times ahead. This project would provide onsite training at my farm where we can learn how to grow climate smart commodities together. I would love to share the experiences I have had growing drought tolerant plants like Moringa.

Imperial Moringa is a small 2 acre farm here in southern California and is about 7 miles north of Mexico and 50 miles west of Arizona. I have been growing Moringa and other edible plants for 5 years to see what would grow in these extreme conditions. I am confident that this project would develop growing techniques that can help other hot and arid areas in the world. With food shortages and dramatic increases in food prices growing local high quality food with the least amount of water should be top priority.

My area has been conventionally farming for over 100 years and synthetic fertilizers and pesticides have been used since they became available. This project would be a great step into bringing new climate smart commodities without using any harmful chemicals. The Imperial Valley soil, air, and people would all greatly appreciate this!

I whole heartedly support this initiative and am looking forward in working together on this plan of producing the next generation of climate smart farming in the Imperial Valley.

Sincerely,



Tony Lopez
Imperial Moringa



May 31, 2022

Dr. Carrie Waterman
University of California Davis
1 Shields Avenue
Davis, CA 95616

Re: Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers

Dear Dr. Waterman:

Seven Harvest, Inc. is committed to assist the University of Arkansas at Pine Bluff in planning and managing applied research in building climate-smart practices with historically disadvantaged and limited resource farmers in addition to providing supervised experiences to at-risk-youths to influence them to become future climate-smart farmers in Arkansas and Mississippi.

The Farmer Field School approach will be a featured practice to help farmers and at-risk-youths to use critical thinking skills and experiments to judge the benefits and rewards for adopting climate-smart practices that are verified to work on their farms to mitigate GHG emissions and sequester carbon over the next five years.

Lastly, Seven Harvest, Inc. will work hand and glove with the University of California at Davis to ensure the full participation of the historically disadvantaged and limited resource farmers to become a competitive force in the supply of farm and forestry commodities in the emerging and anticipated climate-smart marketplace.

We are grateful for the opportunity to serve in this critically important pilot project.

Sincerely,

Barry J. Colley, Ph.D.
Co-Founder, CEO

BJH/dj

Sky High Acres
Lower Lake, CA

Dr. Carrie Waterman
University of California Davis
1 Shields Avenue
Davis, CA 95616

June 6, 2022

Re: Support for Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers Project

Dear Dr. Carrie Waters,

I, Leonard Lumas, at Sky High Acres am enthusiastically in support of the Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers Project. Sky High Acres is a shovel ready landscape for ecologically regenerative practices. We have a diligent staff and administration devoted to the development of climate smart practices that are site specific but applicable to all farms. We are also dedicated to creating an atmosphere of innovation and creative problem solving that will carry many practitioners into an abundant future.

I look forward to collaborating with you on this important pilot project.

Sincerely,

Leonard Lumas
Sky High Acres



May 31, 2022

Letter of Support: Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers

As the Assistant Dean for Extension and Outreach at the University of Arkansas at Pine Bluff (UAPB), I enthusiastically write this letter to express our support and commitment to the University of California at Davis (UC Davis). UAPB is an 1890 land grant university with a mission to serve the socially disadvantaged, small scale and limited resource clientele. UAPB is well positioned to explore climate smart issues that impact the underserved, limited resource clientele.

The proposed UC Davis transformative effort to explore Climate-Smart Commodities among the underserved farmers and producers will advance the understanding and application of climate smart technologies built upon the industry need for precision agriculture, precision livestock, and climate smart farming, which benefits the rural and agricultural economic base of the small scale and limited resource farmers and ranchers.

UAPB is very pleased to collaborate with UC Davis on developing technologies designed to increase agricultural productivity of small and underserved audiences. UAPB will;

1. Design programs that will enhance small farm economic viability, improve rural communities by developing data-driven and precision engineering technologies for small farms and provide technology training to students, farmers and the agricultural workforce.
2. Engage our faculty and students in addressing the Climate Smart agriculture. UAPB has a School of Agriculture, Fisheries and Human Sciences which houses three distinct Departments, namely, Department of Agriculture, Department of Aquaculture and Fisheries and Department of Human Sciences. Each of these departments has programs that address teaching, research and extension. These programs have well qualified faculty who are ready to address Climate-Smart agriculture.
3. Incorporate UAPB's existing Centers of Excellence, namely, *The USDA Regulatory Science Center of Excellence* and the *Aquaculture and Fisheries Center of Excellence*, along with our *Agricultural Engineering* degree program in addressing and disseminating pertinent information on Climate Smart Agriculture.

Consequently, UAPB is very pleased to support the UC Davis' Climate Smart Agriculture project.

Obadiah M. Njue, Ph.D.
Professor/Assistant Dean for Extension and Outreach
University of Arkansas at Pine Bluff
1200 N. University Drive
Pine Bluff, Arkansas 71601
Cell: 501-551-7113
Email: njueo@uapb.edu



UNIVERSITY
of HAWAII®
MĀNOA

June 6th , 2022

Funding Opportunity Number: USDA-NRCS-COMM-22-NOFO0001139

Re: Support for USDA Partnerships for Climate-Smart Commodities Initiative

Dear Dr. Waterman,

I am writing to express support for our application for funding from the USDA Partnerships for Climate-Smart Commodities Initiative. Our project, entitled, Piloting a Climate-Smart Commodity Chain & Research Network to Improve Environmental & Economic Outcomes for Small & Underserved Producers, is partnering with multiple farming entities to form strategic, impactful projects on Climate-Smart Commodities (CSC) with small, underserved producers in both the southeast and west coast regions of the United States. This project will cultivate innovative, climate-smart crops and technologies and promote farmer equity, access, and resources to traditionally marginalized farmers, ranchers, and foresters. It will also adapt and innovate with CSC techniques in urban settings.

This collaborative project will provide on-site training around climate-smart commodities and will host two regional hubs where students, researchers, and small farm producers gather, codesign, train, monitor, and evaluate greenhouse gas benefits from implemented and experimented CSC. The culmination of this project will establish a replicable blueprint for new and existing producers to evaluate their farms in urban and rural settings across the US with new and existing tools designed, modified, and optimized during the program. This project is designed to lay the groundwork for future, innovative, climate-smart work.

As the founder and principle investigator of the University of Hawaii's Sustainable and Organic Agriculture program (SOAP), this project is important to me because of its potential to mitigate the effects of climate change. This is especially important in vulnerable, tropical island communities. With 30 years of research experience in agricultural biodiversity and sustainability in the tropics and elsewhere with underserved communities, I will be responsible for assisting in training and other project activities. Being familiar with your past work in the U.S. and internationally, I am confident in your ability to meet the deliverables outlined in this project and look forward to working with you.

I am available to answer any questions you may have.

Sincerely,

A handwritten signature in black ink, appearing to read 'Theodore J.K. Radovich'.

Theodore J.K. Radovich, Ph.D.
Extension Specialist and Professor
Sustainable and Organic Farming Systems Laboratory
EMAIL: theodore@hawaii.edu;
PHONE: 808-389-4953



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June 6th, 2022

Funding Opportunity Number: USDA-NRCS-COMM-22-NOFO0001139
Re: Support for USDA Partnerships for Climate-Smart Commodities Initiative

Dear Dr. Carrie Waterman,

I, **Cheryl Branch, Executive Director of Los Angeles Metropolitan Churches/GREEN BELIEVERS project**, am writing to express support for our application for funding from the **USDA Partnerships for Climate-Smart Commodities Initiative**. Our project is also partnered with another local nonprofit to bring additional capacity and impact to this proposal, MudTown Farms/WLCAC in Watts neighborhood of South Los Angeles. Our project is entitled, ***Piloting a Climate-Smart Commodity Chain & Research Network to Improve Environmental & Economic Outcomes for Small & Underserved Producers***, is partnering with multiple farming entities to form strategic, impactful projects on Climate-Smart Commodities (CSC) with small, underserved producers in both the southeast and west coast regions of the United States.

This project will cultivate innovative, climate-smart crops and technologies and promote farmer equity, access, and resources to traditionally marginalized farmers, ranchers, and foresters. It will also adapt and innovate with CSC techniques in urban settings.

This collaborative project will provide on-site training around climate-smart commodities and will host two regional hubs where students, researchers, and small farm producers gather, codesign, train, monitor, and evaluate greenhouse gas benefits from implemented and experimented CSC. The culmination of this project will establish a replicable blueprint for new and existing producers to evaluate their farms in urban and rural settings across the US with new and existing tools designed, modified, and optimized during the program. This project is designed to lay the groundwork for future, innovative, climate-smart work.

This project is important to me because reducing health disparities in Black Indigenous People of Color (BIPOC) is part of our mission. We live in an urban area of Los Angeles/Southern California where we lack access to healthy food and health food literacy. We lack quality grocery stores in our community and the violence and domestic terrorism in our neighborhoods is also a contributing factor to making smart crops, improved economic outcomes for small farmers in CA a priority. I will be involved in California and will serve as a project co manager and various project support role. Your support will enable us to raise awareness about the unique food justice needs of BIPOC populations and the urgency to organize, engage,

Dr. Carrie Waterman- Letter of Support
Funding Opportunity Number: USDA-NRCS-COMM-22-NOFO0001139
Re: Support for USDA Partnerships for Climate-Smart Commodities Initiative

empower and educate the community about climate smart food chain and the role academic mentors can play to help us bring about a change.

I have worked with Dr. Carrie Waterman for the past two years and she has connected us to several academic and research finding and best practices, she shows us how to use the tools, how to navigate the academic partnership and we have grown 50% with her guidance. Also, she hired us to manage a video series about food justice for low income communities in South Los Angeles (i.e. Compton and Watts/Willowbrook) and we look forward to working with her again. We plan to expand and partner with another local farm called Mud Town Farms operated by a local nonprofit Watts Labor Community Action Committee a sixty-year-old nonprofit who focuses on food and farming in the urban area. I am confident that Dr. Carrie and MudTown Farms will deliver as promised.

I am available at cherylbranch@gmail.com or by direct phone line 323-273-4586 to answer any questions you may have.

Sincerely,



Cheryl Branch
Executive Director



June 6, 2022

Re: Support for Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers Project

To Dr. Carrie Waterman, University of California at Davis;

My name is Darryl Cotton, and I am the owner and operator of 151 Farms located in San Diego, CA. We are an urban farm that runs a closed loop, constant flow of water between our plants and our fish that when comparing our soilless farm, utilizes 95% less water than traditional soils crop cultivation.

We developed a completely scalable system that relies on a dual root zone so that flowering plants such as hops, moringa, avocados, figs, and a variety of cash crops, can now be successfully included in an aquaponic system farm without causing harm to the fish. We have shared the design, construction, and maintenance of these systems online so that anyone interested in converting to this type of farming can do so as a 151 Farmer or under any entity they choose to do so as. We never got into this to get rich. We simply want to help feed the world and this is certainly one way to do it.

We recognize that we are experiencing a looming climate crisis, the demand for climate-smart commodities, practices, and production is increasing. Scientists and climate change policy-makers are struggling to find immediate solutions and opportunities to positively impact the adverse effects of climate change by creating systems to limit and reduce the emission of greenhouse gas or enhance the sequestration of carbon. Addressing the climate crisis domestically and internationally will require an intersectional approach, enlisting the collaborative support of the whole of government, agricultural, and forestry, including farmers, ranchers, and producers. Unfortunately, over the past 100 years, traditionally marginalized communities, specifically BIPOC peoples, have faced systemic barriers that have prevented equitable access to the marketplace.

Operating at a severe disadvantage, many black and minority farmers, ranchers, and producers have been systematically limited access to resources and opportunities due to various, inhibiting factors. These include rigid laws around farming practices, ability to legally farm and supply products to market, and qualifications; compounding fees and economic barriers to entry; unfair practices and distribution of local, state, and federal resources to farmers and producers; limited access to proper education or to acquisition of grants based on lack of previous experience or capacity. We can no longer tolerate this.

Dr. Waterman we continue to support your efforts to improve conditions in these areas. In keeping with our motto: **If you eat, you're in**, I invite you and your colleagues to share and collaborate with us in any research that helps further improve these methods and to expose more people to the sustainable global farming techniques we have developed, and our world so desperately needs.

We'll see you at the farm!

Darryl Cotton, President, 151 Farms
151DarrylCotton@gmail.com
619.954.4447

6176 Federal Blvd
San Diego, CA 92114
619.954.4447
www.151Farmers.org

Angela Portis Keys
3025 Charleston Drive
Jackson, MS 39212
portiskey@gmail.com

18 May 2022

Dr. Barry J. Colley
CEO Seven Harvest, Inc.
393 SFC 320
Forrest City, AR 72335

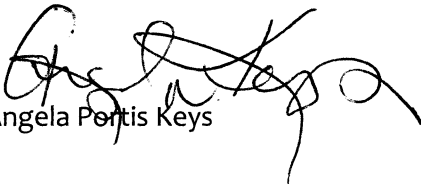
Dear Dr. Barry Colley,

I am a beginning farmer and veteran, and I am committed to using my land in the project, to practice, learn, and the use of my land to study and demonstrate the benefits of climate smart production in the project: **Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers**. I currently have seven acres of forested land. Five of those acres I plan to leave forested and the remaining two use for structured gardens to grow medicinal herbs, food, and flowers. The forested land I will grow forest medicinals (herbs and mushrooms.) In addition, I will raise chickens and bees.

I am aware that climate change is a threat to my farm's natural resources, my farm's profitability and my preference to farm as a way of life. I also am committed to participating in virtual meetings and trainings, field trips and other activities that may be offered during the five years of the project.

I am committed to learning how to protect and preserve my farm land and profits. As I become a better land steward, I will encourage and mentor the next generation of farmers.

Sincerely,


Angela Portis Keys

Colemans Farm LLC
1102 Broadwing Circle
North Olive Branch, MS 38654

May 22, 2022

Dr. Barry J. Colley
CEO Seven Harvest, Inc.
393 SFC 320
Forrest City, AR 72335

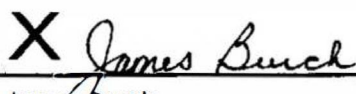
Dear Dr. Barry Colley,

I have farmed for the past 3 years, and I am committed to using my land in the project, to practice, learn, and to use of my land to study and demonstrate the benefits of climate smart production in the project: Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers. My land consists of 2-acres of vegetables, including 1-30x72 foot high tunnel, 40 acres of forest land, and 15 acres of pasture.

I am aware that climate change is a threat to my farm's natural resources, my farm's profitability and my preference to farm as a way of life. I also am committed to participating in virtual meetings and trainings, field trips and other activities that may be offered during the five years of the project.

I am committed to learning how to protect and preserve my farmland and profits. And as I become a better land steward, I will encourage and mentor the next generation of farmers.

Sincerely,



James Burch
Manager



Creation of Society, LLC.
Christen Brown
creationofsociety@gmail.com
(707) 386- 2777
California, USA

June 6, 2022

Dear Dr. Waterman,

Our family and community stakeholders from the greater bay area in California are in full support for the **Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers Project**. We are currently using moringa as a staple food with our extensive family and friends, while bringing more awareness to the benefits this tree provides to our community. Moringa has allowed our community to practice eating patterns that will provide our bodies with the nutrients needed to eliminate anemia—a pressing issue in many historically underserved US populations and among women.

One of our primary reasons for using moringa to address our overall health needs is based on our family having a history of sickle cell anemia. Sickle cell can be life threatening and carriers of the trait have been known to experience extreme pain classified as a "crisis" in which blood cells begin to lose oxygen, sickle, and stick together, this causes blocked pathways within red blood cells' natural flow and function. This disposition can be corrected through nutrition as it relates to food choice. Moringa leaves and seeds contain important phytochemicals known as isothiocyanates which have been known to have anti-sickling effects on blood cells. It is for this reason why we have been encouraging members of our Sickle cell community to also utilize moringa as a staple food in their daily nutritional regimen. The emphasis on what moringa can do for the Sickle Cell community directly correlates to the concept of food justice by creating awareness around culturally specific foods. Moringa is the pathway to food sovereignty for our sickle cell and greater community and this grant will bring us one step closer to materializing the vision of using food as medicine.

It was a pleasure to be part of the moringa CA stakeholder group involved in the CDFA SCBGP 2020-2023 on **Making Global Solutions Local: Increasing Awareness and Consumption of Nutrient-Dense Moringa for All Californians**.

We believe moringa is an up-and-coming smart crop with great potential impact for: localized production for food security; the agricultural footprint on the environment, and greatly improving the health and livelihoods of Black communities in the US. We are eager to expand our moringa business and gain supply of moringa from within the US, rather than from exportation from overseas.

In Truth,

A handwritten signature in blue ink, appearing to read 'Christen Brown', with a large, stylized flourish at the end.

Christen Brown



430 CHERRY STREET
HELENA, ARKANSAS 72342
DELTADIRTDISTILLERY.COM

May 27, 2022

Dr. Barry J. Colley
CEO Seven Harvest, Inc.
393 SFC 320
Forrest City, AR 72335

RE: Pilot for a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers

Dear Dr. Barry Colley,

Delta Dirt Distillery, America's only black owned farm distillery, will participate in conducting applied research with Socially Disadvantaged Farmers and Ranchers (SDFR) on climate smart practices. We believe there are far reaching and sustainable benefits of SDFRs adopting climate smart production and management strategies to supply farm commodities in the emerging and anticipated climate smart marketplace.

We fully support participation of SDFRs in climate smart and regenerative farming whereby they adopt a set of useful best practices that are affordable, contribute to high yields and provide a useful set of tools for climate mitigation which enables significant returns on investment with their crops, livestock and forestry enterprises. Delta Dirt Distillery expects the project's innovative related instruction and modeling on climate change to build interest and understanding for a new generation of climate change practitioners to emerge in the communities of SDFRs.

We are hopeful for the results and grateful for the opportunity to support this vitally important pilot project.

Sincerely,



Harvey Williams, President



June 6, 2022

Dr. Barry Colley
393 SFC320
Forrest City, Arkansas 72335

Dr. Colley:

The Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers project provides an opportunity to demonstrate and build evidence for equity share partnerships as an effective business model for Socially Disadvantage Black Farmers (SSDBF) to succeed in fruit and vegetable farming. It is my understanding that Seven Harvest, Incorporated and its farm business managers will strive to demonstrate: user friendly business decision-making, farm business cooperation, and profit-sharing among SSDBFs.

This letter is Evansington Farm's expression of support and commitment to work with Seven Harvest Inc. (SH) and its collaborating partners on the above referenced project. My farm sees this as a unique opportunity to augment understanding, learning, and dissemination for the value of SSDBFs' operating a farm business as an equity share partnership that energizes and enables collective resources.

Evansington Farm will join SH and other actors in the local foods value chain to enable SSDBFs to stretch their resources to successfully create and expand opportunities in produce enterprises with regard to operating a Limited Liability Company as a farm business equity share partnership model. We look forward to an opportunity to participate in this project as a farmer member of the LLC.

If you have questions or comments, I can be reached at evansingtonfarm@gmail.com or via telephone 501-240-0232.

A handwritten signature in black ink that reads "Jason L. Evansington".

Jason Evansington
Owner/Operator

Telephone Number:
501-240-0232

Address:
P.O. Box 168
Forrest City, AR 72336

Email:
evansingtonfarm@gmail.com

Future Agricultural Resources for Minority Youth
Bellsenterprises.com/farmy

May 24, 2022

Dr. Barry J. Colley
CEO Seven Harvest, Inc.
393 SFC 320
Forrest City, AR 72335

Re: Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers

Dear Dr. Barry Colley,

I have farmed for the past thirty-five years and I am committed to using my land in the project, to practice, learn, and to use of my land to study and demonstrate the benefits of climate smart production in the project: **Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers**. I farm 458 acres in soybean and milo corn rotation.

I am aware that climate change is a threat to my farm's natural resources, my farm's profitability and my preference to farm as a way of life. I also am committed to participating in virtual meetings and trainings, field trips and other activities that may be offered during the five years of the project.

I am committed to learning how to protect and preserve my farm land and profits. And as I become a better land steward, I will encourage and mentor the next generation of farmers. I understand Seven Harvest will pay me \$500.00 per acre up to two acres per year to demonstrate climate smart practices on my farm and measure GHG emissions and sequestering carbon.

Sincerely,

Ellis E. Bell

Ellis E. Bell



HARAMBEE FARMS

1490 CARLTON

MEMPHIS, TN 38106

Dr. Barry J. Colley
CEO Seven Harvest, Inc.
393 SFC 320
Forrest City, AR 72335

June 6, 2022

Re: Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers

Dear Dr. Barry Colley,

As a family farm that focuses on agriculture training and preparation of students to 1890 HBCU land grant colleges and universities we fully support the effort to assist Small and Underserved Producers. Seven Harvest has created a network and regional infrastructure in the Mississippi delta that is a model for farmers.

As a family farm, it is imperative that regenerative best practices are developed that can be supportive for the generational environment of the farm. The goals of this project will benefit students as they learn and witness emerging technologies and industries in environmental arenas. We will gladly be an information hub in this project throughout the Mid-South.

Harambee Farms has witnessed the standards, work and outcomes of Seven Harvest. The effort to impact communities and generations via working with Small and Underserved Producers we embrace and applaud.

We are grateful for the opportunity to serve in this critically important pilot project.

Sincerely,

Dale Muhammad M.S. Ed.

Farmer and Director



635 Gipson Drive
Lamar, MS 38642

May 16, 2022

Dr. Barry J. Colley
CEO Seven Harvest, Inc.
393 SFC 320
Forrest City, AR 72335

Re: Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers

Dear Dr. Barry Colley,

Mid South Progressive Agricultural Group (MSPAG), a farm cooperative, located in North Mississippi will disseminate information that supports the recruitment of Socially Disadvantaged Farmers and Ranchers (SDFR) during the 5 years of project implementation. Our efforts will be undertaken with the steadfast goal of SDFRs adopting climate smart production and management strategies to supply farm and forestry commodities in the emerging and anticipated climate smart marketplace.

We wholly support the full participation of SDFRs in climate smart and regenerative farming whereby they adopt a set of useful best practices that are affordable, contribute to high yields and provide a useful set of tools for climate mitigation and resilience and enables significant returns on investment with their crop, livestock and forestry enterprises. Mid South Progressive Agricultural Group expects this project's innovative related instruction and modeling on climate change to build interest and understanding for a new generation of climate change practitioners to emerge in the communities of SDFRs.

We are grateful for the opportunity to serve in this critically important pilot project.

Sincerely,

Revelyn Coleman

Revelyn Coleman

Communications Director



NORTH-SOUTH INSTITUTE, INC.
4548 North Hiatus Road, Sunrise, FL 33351
Phone (954) 434-8220 Fax (954) 434-8221
E-mail: nsied2002@aol.com
www.nsied.org

June 10, 2022

Dr. Barry J. Colley
CEO Seven Harvest, Inc.
393 SFC 320, Forrest City, AR 72335

Dear Dr. Barry Colley,

Re: Support for USDA Climate-Smart Partnership Grant

The North South Institute is pleased to endorse and support Dr. Barry Colley and Seven Harvest, Inc. for the application entitled: **Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small & Underserved Producers**. The North-South Institute is an American NGO, a Federal Tax Exempt 501(c) 3 multidisciplinary group (www.nsied.org). It is a regional economic development organization, think and do tank, whose objective is to promote sustainable development systems and foster eco-economic development within an international business and trade framework. It serves rural small businesses, enterprises, small and medium-sized farms and ranches. Its mission is "Building Sustainable Livelihoods and Communities by Providing Solutions in the Eradication of Poverty, Hunger, Illiteracy and Human Suffering Through Empowerment, Education, Entrepreneurship, Enterprise Development and Economic Development." To date its work through more than 40 strategic partnerships has impacted the livelihoods of over 12,000 direct and indirect beneficiaries in the Delta and Southern States and over 30,000 globally.

Dr. Colley and Seven Harvest, over the years have provided business development support to our USAID Caribbean Basin Initiative and is currently providing evaluation support to strengthen the Institutes program delivery to military veterans and families in commercial farming, allied agriculture job training, and enterprise development in the USDA/NIFA-AGVET Program. The Institute also collaborated with Dr. Colley, the Seven Harvest CEO in a five-country enterprise development study (China, Honduras, Romania, Kenya and U.S.) during his service as the Enterprise Development Director with Heifer International.

Seven Harvest is an excellent candidate, sub awardee due to its coverage of its work and the substantial experience that it brings to the project in serving Socially Disadvantaged Farmers and Ranchers. Seven Harvest has implemented several modules that we will support in implementing the targeted project activities. If you have any questions or further information, please feel free to contact me at the office (954) 434-8220 or on my cell phone (954) 254-7620.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott", is written over a light blue rectangular background.

Dr. Samuel W. Scott
Executive Director and Chief Executive Officer

**The Poverty Alleviation Fund
35 Cummings Road
Hanover, New Hampshire 03755**

26 May 2022

Dr. Barry J. Colley
CEO Seven Harvest, Inc.
393 SFC 320
Forrest City, AR 72335

Re: Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers

Dear Dr. Barry Colley,

My Organization, The Poverty Alleviation Fund, a 501 (C) (3) has been active since 1990 promoting sustainable small holder agricultural development abroad and more recently in the Mississippi Delta region. Central to our mission has been promoting village level productive activities contributing to the sustainable employment and well-being of ethnic minority and other disadvantaged persons. Our village based activities have often been located in areas affected by deteriorating environmental conditions due to climate change, especially in Tibetan areas of China and more recently the Mississippi Delta. For these reasons I decided in 2020 to support the work of Seven Harvest, Inc that was experimenting and promoting sustainable small holder agriculture and agricultural support industries in the upper delta region. Under Dr. Barry Colley's leadership and extensive experience in promoting sustainable small holder farming in Africa and elsewhere, I noted Seven Harvest Inc. practicing and promoting the types of innovative farming techniques leading to successful marketing in Memphis area. I saw Seven Harvest, Inc agricultural practices also successful in areas likely to be increasingly adversely affected by Climate Change.

I believe that Seven Harvest, Inc has the capability, and is in fact promoting the adoption best climate smart practices with Small and Underserved Producers (SUP). It is also disseminating information relevant to the needs of black and other ethnic minority veterans returning to the US and interested in utilizing climate smart practices important for sustainable agriculture and agricultural support industries in the Delta region. Seven Harvests, Inc's current steadfast goal is to assist SUPs in adopting climate smart production and management strategies in their supply of agricultural products in local and regional markets.

I have been impressed with Seven Harvest Inc's commitment to the full participation of SUPs in climate smart and regenerative farming based on adoption of best practices that are affordable, contribute to high crop yields and provide a useful set of tools for climate mitigation and resilience. I believe that Seven Harvest Inc under the new project's innovative related instruction and modeling on climate change can help contribute substantially to the development of a new generation of very capable and

successful climate change specialists and to the adoption of climate smart best farming practices within SUP communities.

I believe that Dr. Barry Colley and Seven Harvest, Inc merit an important role in the further development of climate smart farming practices benefiting SUPs in the Mississippi Delta region and elsewhere.

Sincerely,

A handwritten signature in cursive script that reads "Arthur N. Holcombe". The signature is written in dark ink and is positioned below the word "Sincerely,".

Arthur N. Holcombe President
The Poverty Alleviation Fund

Ten Eight Brangus Cattle & Ag.
1099 Valleyview
El Centro, CA 92243

June 6, 2022

Re: Support of Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers Project

Dear Dr. Carrie Waterman,

As an independent farmer and cattle breeder located in Imperial County, California, I am truly in support of your effort in bringing knowledge, research and her expertise in Moringa oleifera to California and its residents.

For too long California residents have relied on common crop commodities such as spinach, kale, broccoli, carrots etc. However, with the current market, fuel prices, and food shortages, Californians should begin seek out other food alternatives. This is where Moringa plays a role. Moringa has multiple beneficial uses. Moringa has essential vitamins and minerals which provide high nutritional value when consumed by humans. Similarly, it can be fed to livestock and increase milk production in addition to receiving its high nutritional content. Moreover, Moringa is a drought tolerant crop that requires minimal water in comparison to our common crops, which can assist in conserving our natural water resource, that is supplied by the Colorado River.

It should be noted that Imperial County has numerous cattle feed lots spread throughout the county. According to the latest annual report produced by the Imperial County Agriculture Commissioners Office, cattle has been the number one commodity over the last few years. This has generated great commerce for the state of California, but at the cost of leaving behind its carbon footprint. I believe as an effort to combat this issue, we as Californians should further seek Moringa for its carbon sequestration abilities in an attempt to mitigate this problem as well.

In summary, I know from personal experience Moringa thrives in Imperial County and has many benefits to it, which is why I would like to reiterate that I am fully supportive of this project. Should you have any questions, feel free to contact me.

Sincerely,

Jesus A. Viesca

Ten Eight Brangus Cattle & Ag.
calidredbrangus@outlook.com
760-791-0807



May 14, 2022

Dr. Barry J. Colley
CEO Seven Harvest, Inc.
393 SFC 320
Forrest City, AR 72335

Dear Dr. Barry Colley,

Thanda International supports the project **Re: Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers.**

Thanda International will provide Unmanned Aircraft Systems training for farmers and ranchers related to measuring changes and reduction of GHG emission and carbon sequestration. In addition, Thanda International could provide use or demonstration of carbon neutral technology, drones, robotics, irrigation and other digital technology for demonstrations of climate smart practices, on farmer fields, provide video clips and webinars related to crops, livestock and forest enterprises.

Thanda International is committed to engage farmers and ranchers on a one-on-one basis to raise awareness of how technology can assist in their higher crop yield and less chemical utilization of fertilizers and pesticides for the betterment of our ecosystem.

Sincerely,

Joseph Davis Sr

Joseph Davis, Sr.
President, Thanda International

June 8, 2022

Dear USDA NCRS Review Committee,

Funding Opportunity Number: USDA-NRCS-COMM-22-NOFO0001139

Re: Support for USDA Partnerships for Climate-Smart Commodities Initiative

I am writing to express support for Dr. Carrie Waterman's application for funding from the **USDA Partnerships for Climate-Smart Commodities Initiative**. Their project, entitled, ***Piloting a Climate-Smart Commodity Chain & Research Network to Improve Environmental & Economic Outcomes for Small & Underserved Producers***, is exciting and well aligned with today's climate pressures and the expertise of your team. The project on Climate-Smart Commodities (CSC) will help to cultivate innovative, climate-smart crops and technologies and promote farmer equity, access, and resources to small underserved producers, ranchers and farmers across the US. UC Davis and its many departments will be interested to work with you and your partners to encourage student and intern engagement on your experimental farms sites in CA. Your First-Year seminar taught at UC Davis this past Quarter drew great interest from freshman students and is indicative of students overall desire to engage in CSC research, mentoring, and career development.

Dr. Waterman has been a successful researcher at UC Davis over the past 7 years. She has worked directly with small holder farmers in East Africa and in California through her NIH Fogarty K01 grant, several UC Global Affairs grants, USDA SCBGP grant to promote moringa in CA; and most recently as the PI of the UC-wide Global Health Institute's Center on Food Justice. Dr. Waterman is capable of coordinating this multi state grant focused on CSC.

As the director of the World Food Center and Sesnon Endowed Chair of the Animal Sciences Department, I can attest to the importance and significance of this proposed pilot project. Our work has been focused especially on:

1. Whole system approach to quantifying greenhouse gas emissions in agriculture.
Mathematical modeling and mitigation of emissions from animals, manure and soil.

2. Development of energy and nutrient utilization/requirement models in livestock.
3. Sustainable agriculture, in particular animal production in relation to environmental sustainability.

I'm happy to offer our College's support in the research and development aspects of this project. I'm aware that by Y3 Dr. Waterman intends to submit additional USDA and NIFA grants aimed specifically at measuring methane emissions from cow fed alternative diets with nature based inputs including moringa and other smart crops the CSC Hubs will cultivate. If their team is able to secure funding, we would support the use of our dairy cow experimental facility in 2025-2026. This facility had been used to demonstrate reduced emissions by dairy cows with altered diets by over 50%. These types of data will be useful to this CSC project and for future ranchers facing climate pressures. Overall we support the multi-disiplinary approach of Dr. Waterman and her team who is well networked at UC Davis to utilize the vast faculty, staff and students focused on climate solutions across the food value chain.

Please feel free to contact me by phone at 530-752-5907 or email: ekebreab@ucdavis.edu

Sincerely,



Ermias Kebreab, Ph.D.





June 6, 2022

Dr. Barry Colley
Seven Harvest Farm, Inc
393 SFC 320
Forrest City, AR 72335

Dear Dr. Colley:

On behalf of Zenenvirotech, Incorporated, I am honored to provide this letter in support of Seven Harvest, Incorporated's Piloting a Climate-Smart Commodity Chain and Research Network to Improve Environmental and Economic Outcomes for Small and Underserved Producers Project that is designed to increase market opportunities for African American Farmers in the Delta region of Arkansas.

Zenenvirotech is committed to working with Seven Harvest by providing technical assistance, project management, and business development. The aforementioned services will be essential in positioning the target audience to compete in farming as well as in other sectors of Agriscience.

If you have questions or comments, I may be reached at 501-960-6451. Thank you for the opportunity

A handwritten signature in cursive script that reads 'Niki Evansington'.

Niki Evansington, President

P.O. Box 241464 – Little Rock, Arkansas 72223 – 501.960.6451

Budget Narrative File(s)

FileName	MimeType
Budget_Narrative_1035494656.pdf	application/pdf

USDA Partnerships for Climate Smart Commodities Grant – Internal Budget Justification

PI/PD: Dr. Carrie Waterman

Personnel

The PI will be paid at their existing salary rate of \$95,500 (with 3% annual increase at each fiscal year start) over the grant period starting in April 2023. The PI will commit 41.67% effort in Year 1 and 100% effort in Years 2-5. Fringe benefits are initially calculated at 38.9%, and a 3% escalation is applied at each fiscal year start (beginning July 1) per UC budgeting policy. Total costs are \$662,961. The PI will provide planning, implementation, execution, and monitoring and evaluation of the project. She will travel to regional hubs in the Southeast and to regions in CA for Climate-Smart Commodity training. She will be responsible for ultimate project outcomes, success and reporting.

Travel

A total of \$265,000 is included to cover travel and training meetings. This will include Focus Group Meeting attendees (air/ground transportation, lodging, meals) in CA and AR (\$5000 for each meeting with 4 meetings the first year, followed by 2 meetings per year in Y2-Y5). The purpose of these meeting will be to assess CSC needs, co-design and select CSC implementation projects; and plan CSC market cost/benefit analysis; The PI and regional partners will attend along with small underserved producers (SUP) in the area and/or enrolled in the CSC training programs. These should be 1-2 day events with \$500 given to each participant for travel for a total of 10 people per focus group. Farm Tours for CSC training (meeting facilities, supplies, transportation) in CA (\$10,000 in Y1/Y5 and \$20,000 in Y2-Y4) for 80 SUP with \$1000 for travel costs to cover a 2 day on-site CSC training. We will host 1 Annual 5-day Workshop \$25,000 each) to bring primary partners and farmers together in CA or the South East at training farm sites for M&E and trainee reporting. We plan to utilize existing facilities and/or student dorms for lodging and will offer 50 participants \$500 per person for travel/per diem.

Material & Supplies

A total of \$478,500 will be spent on materials and supplies including seeds, tree samplings (\$40,000 per yr) soil, bio nutrients (\$50,000 per yr), vermiculture tools and containers, general farming supplies, biochar supplies and structures for storage. These will be provided to new and beginning farmers enrolled in the training programs and invested on their respective farms.

One time purchase of irrigation materials (\$8500 in Y1) will be bought for Sky High Acres and a solar dryer (\$10,000 in Y1) for Tony Lopez's farm training site. Biochar (\$3000) and vermicomposting (\$2000) supplies will be bought in Y1 and Y2 for these sights. The farms will be responsible for maintaining these and any funding needed in Y3-Y5.

Publications

Printed material will include the CSC training manuals (\$8,000 in Y3 and Y4 and \$2000 in Y5) and flyers, posters, printed materials to advertise and recruit farmers and present at local and regional events (\$6000 in Y1 & Y2; \$2000 in Y3 & Y4. \$5000 is included in Y5 for open access publication fees for CSC journal submission. Total costs for publication materials is \$39,000.

Subawards

Two subawards will be issued each in the amount of \$750,000 to our collaborating partners Seven Harvest in AK run by Dr. Barry Colley and Sky-High Acres lead by Leonard Lumus.

Seven Harvest will receive \$150,000 per year to cover personnel, materials and supplies, and training facilities/accommodations for students, farmers, and researchers.

- The Seven Harvest Hub Director provides management and leadership in the program planning & budgeting of the Climate Smart hub sub-agreement. The SH Hub Director develops with his/her team strategies and tactics to Implement the Climate Smart Hub Admin council and the Climate Smart Project committee, directs and oversees communications with UC Davis and climate smart hub contract partners University of Arkansas at Pine Bluff (UAPB) and East Arkansas Enterprise Community (EAEC), directs team building approaches with researchers, farmers, USDA and private sector stakeholders.
Compensation: @ \$15,000 per Year x 5 Years = \$75,000
- The Seven Harvest Mid-South Coordinator provides monitoring and bench marking support, Coordination and logistics in climate Smart practice trials in AR, MS and TN counties, marshals project support for UAPB climate smart sequestration practice trials, GHG emission verification procedures, and EAEC support of at risk youth farmer interns, farmer & partners. Provide Administrative support to the SH Hub Director with scheduling. Administrative council and Climate Smart Committee Meetings and appointments and Partner visits with UAPB and EAEC USDA visits. Develop and file project documents and support bookkeeping assistant as necessary.
Compensation: @\$10,000 per Year X 5 Years = \$50,000
- The Seven Harvest Climate Smart Interns includes at-risk youth who will work on the farms of Black and Indigenous Farmer Veterans in MS, TN, AR and are provided supervised occupational experiences with opportunities to learn Climate smart farm and forestry practices.
Compensations: Interns are paid \$4,000 per year x 5 years = 20,000
- SH Contract Partners will include:
East Arkansas Enterprise Community (EAEC)
 - Climate Smart Farmer recruitment activities St. Francis, Lee, Monroe, Phillip Counties: @\$750 per county x 4 = \$3,000 per year x 5Yrs = \$15,000
 - EAEC Internship Coordinator@ \$5,000yr x 5Yrs = \$25,000
 - 2EAEC Interns @\$4,000 each x 5Yrs =\$40,000 Total EAEC Support \$80,000
University of Arkansas at Pine Bluff (UAPB)
 - GHG Emission Measurement and Monitoring 5 students @ \$4,000 per year X 5 years = \$100,000
 - Climate Smart (CS) Equipment, Tools and Supplies (CS trials, no till, agroforestry, cover crops, Climate Smart Specialty Crops)@ \$3000 per Yr x 5= \$15,000
 - GHG emission measure, monitor/verify tools & supplies @\$3,000per Yr x 5= \$15,000 = Total UAPB Support \$130,000
- Climate Smart (CS) Farmer Support
 - 50 farmers @ \$1000 per year will participate. During year long CS Farmer Trials: Farmers receive \$500 per acre x 2 acres per year. Per farm cost benefit per farmer is \$1000 x 50 farmers per year x 5 years =\$250,000

Sky-High Acres will receive \$286,000 in Year 1, \$251,500 in Year 2, and \$212,500 in Year 3 to cover personnel, materials and supplies, and training facilities/accommodations for students, farmers, and researchers.

- Personnel/Staff
 - Leonard Lumas will be paid a salary of \$150,000 (50k x 3 years) to oversee and manage all personnel and programs. Dan Halsey – Director of farming \$60,000 training at \$20,000 per year x 3 years (Design curriculum and phases for smart farming, listing plants, trees, seeds, soil and phases and locations for implementation) Darlene Valle – Project Administrator & Site coordinator \$60,000 @ \$20,000 per year.
- Training
 - \$180,000 for training of student/Interns and farmers over 3 years; 10 student/interns per year at \$4,000 each x 3 years (total 30 student/interns) for a total of \$120,000. 20 farmers at \$1,000 a year x 3 years (total 60 farmers) and \$60,000 total for farmers.
- Training Supplies
 - \$70,000 to provide farming tools and equipment required to prepare & prep land designated to teach 30 student/interns and 60 farmers effective methods for plants, shrubs, trees, soil preparation, irrigation, water retention and fire mitigation..
- Climate Smart Regenerative Materials
 - \$130,000 total allocated as follows. **\$68,000** for purchase of trees, shrubs, seeds, fertilizers, nutrients, for erosion control, cover crops (\$30,000 year 1, \$30,000 year 2, \$8,000, year 3. **\$10,000** Livestock and shelter \$5,000 in year one, \$2500 years 2 and \$2500 year 3. Purchase growing structures **\$15,000** (\$5,000 ea x 3 years) to store and nurture seed to plants and staging for new plant deliveries. **\$7,000** using various metering devices to test water retainage, soil erosion and land stability, \$2000 year 1, \$4,000 year 2, \$1,000 year 3. Irrigation allocation of **\$30,000** over 2 years - \$20,000 year 1, \$10,000 year 2 to provide purchase and installation of 2500' of 2" piping distributed to designated crops and hillside for plants, trees and seeds methods to reduce water waste.
- Ecological Restoration Training
 - \$100,000 over 3 years allocated as follows: **\$30,000** that will include earth and other temperature control structures for food and production storage, \$10,000 per year x 3 years. **\$30,000** for land restoration \$10,000 per year x 3 years, **\$26,000** for hydrological restoration training \$10,000 year 1 and year 2 and \$6,000 year 3. Crop Harvesting and Processing allowance of **\$14,000**. \$4,000 year 1, \$5,000 year 2, \$5,000 year 3.

Contractual Fees

Independent contractors James Brady, Con10u2Farm (\$40,000 per year; total \$200,000)- to provide urban ag curriculum development and training; Gaidi Faraj, Grambling State University (\$50,000 per year; total \$250,000) -to provide mentorship, logistical coordination of HBCU students with farms, GHG M&E co-development, and M&E by MSI students and faculty; Tony Lopez- Moringa farmer in Imperial, CA (\$36,000 per year; total \$180,000) to host students on CSC training for drought-tolerant, heat tolerance, and nature-based inputs (NBI); Cheryl Branch, Green Believers, Los Angeles (\$7000

per year; total \$35,000)- social equity project coordinator and website design and maintenance; Ted Radovich, UH (\$10,000 per year; total \$50,000- ag extension guidance for CSC practices (permaculture, biochar, low-till, soil health, implementation, and M&E.). Total contractual fees for all 5 independent contractors over 5 years will be \$715,000.

Indirect Costs

Indirect costs are budgeted at 59.5% to 61% of Modified Total Direct Costs, in accordance with the UC Davis federally-negotiated indirect cost rate agreement, dated 6/28/21. A total of \$1,338,681 is requested for indirect cost recovery for the duration of the project.

Attachments Form

Instructions: On this form, you will attach the various files that make up your grant application. Please consult with the appropriate Agency Guidelines for more information about each needed file. Please remember that any files you attach must be in the document format and named as specified in the Guidelines.

Important: Please attach your files in the proper sequence. See the appropriate Agency Guidelines for details.

- 1) Please attach Attachment 1
- 2) Please attach Attachment 2
- 3) Please attach Attachment 3
- 4) Please attach Attachment 4
- 5) Please attach Attachment 5
- 6) Please attach Attachment 6
- 7) Please attach Attachment 7
- 8) Please attach Attachment 8
- 9) Please attach Attachment 9
- 10) Please attach Attachment 10
- 11) Please attach Attachment 11
- 12) Please attach Attachment 12
- 13) Please attach Attachment 13
- 14) Please attach Attachment 14
- 15) Please attach Attachment 15

BUDGET INFORMATION - Non-Construction Programs

SECTION A - BUDGET SUMMARY						
Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		Total (g)
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	
1. Federal				\$4,999,142.00		\$4,999,142.00
2.						\$0.00
3.						\$0.00
4.						\$0.00
5. Totals				\$4,999,142.00		\$4,999,142.00
SECTION B - BUDGET CATEGORIES						
6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY					
	(1) Federal	(2)	(3)	(4)	Total (5)	
a. Personnel	\$467,178.00					\$467,178.00
b. Fringe Benefits	\$195,783.00					\$195,783.00
c. Travel	\$265,000.00					\$265,000.00
d. Equipment	\$0.00					\$0.00
e. Supplies	\$478,500.00					\$478,500.00
f. Contractual	\$715,000.00					\$715,000.00
g. Construction						
h. Other	\$1,539,000.00					\$1,539,000.00
i. Total Direct Charges (sum of 6a-6h)	\$3,660,461.00					\$3,660,461.00
j. Indirect Charges	\$1,338,681.00					\$1,338,681.00
k. TOTALS (sum of 6i and 6j)	\$4,999,142.00					\$4,999,142.00
7. Program Income						

SECTION C - NON-FEDERAL RESOURCES				
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
12. TOTAL (sum of lines 8-11)				
SECTION D - FORECASTED CASH NEEDS				
Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal				
14. Non-Federal				
15. TOTAL (sum of lines 13 and 14)				
SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT				
(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
20. TOTAL (sum of lines 16-19)				
SECTION F - OTHER BUDGET INFORMATION				
21. Direct Charges:				
22. Indirect Charges:				
23. Remarks:				