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Project Title:
Landscape Analysis of African American Farmers in North Carolina and Approaches for Applying NASA's Data to Help Prevent their Extinction

Annual Report

July 5, 2023

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Executive Summary

RTI performed a Landscape Analysis through a grant with NASA's Applied Science Program to develop an awareness of Equity and Environmental Justice issues that North Carolina's African American farmer communities face. RTI collaborated with four community organizations as part of this effort to engage North Carolina's African American urban and rural farming community. These community groups have provided access to their networks, which has been beneficial for reaching farmers for engagement in this study. Through surveys and listening sessions, we have gained insight into barriers facing black farmers, as well as the degree to which African American farmers can use NASA's technology in support of addressing equity and environmental challenges. The results of our engagement illustrate that there is a direct relationship between resource capacity and the ability to address environmental injustices and climate change. Physical, educational, and financial resources are needed for farmers to prioritize the use of the technological solutions available to enhance their farming practices in the fight against a deteriorating environment. The combination of systemic and structural racism, along with the compounding effects of environmental discrimination and degradation, has exacerbated the struggles of African American farmers in North Carolina.

Project Summary

Project Goals & Objectives

The objectives of this research were as follows:

1. Perform a Landscape Analysis to identify equity and environmental justice challenges faced by African American farmers in North Carolina.
2. Collaborate with African American community organizations working to address Environmental Justice issues faced by black farmers in North Carolina to ascertain the best approaches to work with them, thereby advancing the application of Earth Science to expand awareness, accessibility, and use of Earth science information.
3. Provide NASA with guidance about actions or next steps that could be taken to work with and positively impact this environmental justice community.

There were 6 Research Questions we sought to answer during this project.

1. What environmental injustices and inequities have African American farmers experienced?
2. What activities are happening that will help African American farmers address environmental injustices?
3. What data and tools are available from NASA to help farmers with their farming practices?
4. Can these tools be used to alleviate environmental inequities?
5. What barriers currently exist that make the adoption of tools and technology challenging for farmers?
6. What recommendations can be made to NASA that will help them address these barriers?

Our first step was to review the landscape, which involved performing environmental scans to identify environmental issues and burdens faced by farmers. Using that information in collaboration with our community partners, we developed a short survey to distribute to black farmers in NC. We also held in-person and virtual listening sessions with them. The information collected were used as inputs into the recommendations we are making to NASA.

Executive Summary of Project Progression

This project was carried out by economists and earth scientists in collaboration with community organizations that have years of experience working with African Americans farmers. We partnered with four community groups. Our community partners were instrumental in getting access to black farmers in their networks. They helped us organize listening sessions and assisted us with surveying approximately 50 black farmers. Through this task, we were able to gain an understanding about the issues facing African American farmers, as well as the technology the currently use, and barriers that would make it difficult for them to adopt technology developed by NASA.

Our engagement with black farmers in North Carolina demonstrates the intersectionality of environmental justice and economic justice. There is a direct relationship between resource capacity, environmental justice, and climate change. Physical and financial resources are needed to employ tools and technology, such as those provided by NASA, and to fight the effects of climate change. Those without resources (in this case, African American farmers) experience the largest environmental burdens.

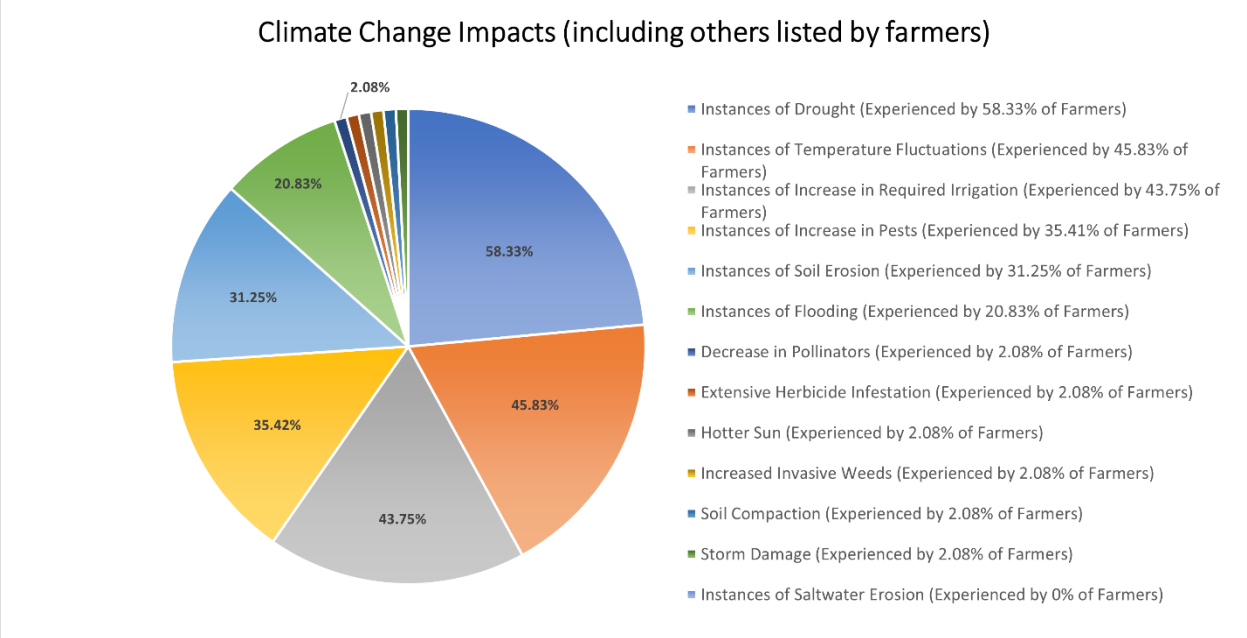
Activities & Outcomes

Project Advancements

Through surveys and listening sessions, we have identified the following concerns and barriers for technology use that exist for black farmers in North Carolina.

Climate Change Concerns among black farmers in North Carolina

The most cited climate change impact experienced by black farmers was instances of drought. Over half of the farmers we surveyed responded that they have experienced this issue.



Lists of environmental, climate change, and socio-economic concerns

We asked survey questions to understand the environmental injustices being experienced. We received a range of answers, including things like degraded air and land quality, as well as economic inequities like lack of access to grant resources and land loss. The responses demonstrate the intersectionality of environmental issues with economic and social issues.

Environmental/Climate Change Concerns

- Animal farms being built in our communities
- Aerial spraying
- Factories near minority communities causing poor air quality
- Farm proximity to construction
- Farm proximity to landfill
- Seasonal temperature changes resulting from climate change
- Crop Adaptivity
- Decrease in water quality
- Nutrient runoff
- Removal of native bushes/tress
- Gas pipeline on property
- Contaminated soil/air/water
- Effects of the growing season
- Getting precise weather prediction information
- Increased irrigation need
- Increased rainfall causing soil erosion & depleting nutrients in the soil
- Rising temperatures
- Shortened Spring/Summer months
- Temperature fluctuations
- Unpredictable blooming season

Social/Economic Concerns

- Access to grant resources
- Companies buying up land
- Decisions being made by the wrong people
- Efforts to address the issues will just be talking points
- Extractive disaster economics
- Loan process
- Land disputes
- Difficulty in getting the necessary information
- Discriminatory land use
- Discriminatory policies/regulations
- Inequitable access to capital/financing/refinancing
- Inequitable access to distribution opportunities

  Inequitable access to markets
- Poor quality land being given to minorities
- Finding reliable resources to help navigate changes
- Getting the assistance to address the impacts of climate change
- How much of climate change had to do with government manipulation
- Lack of necessary political attention

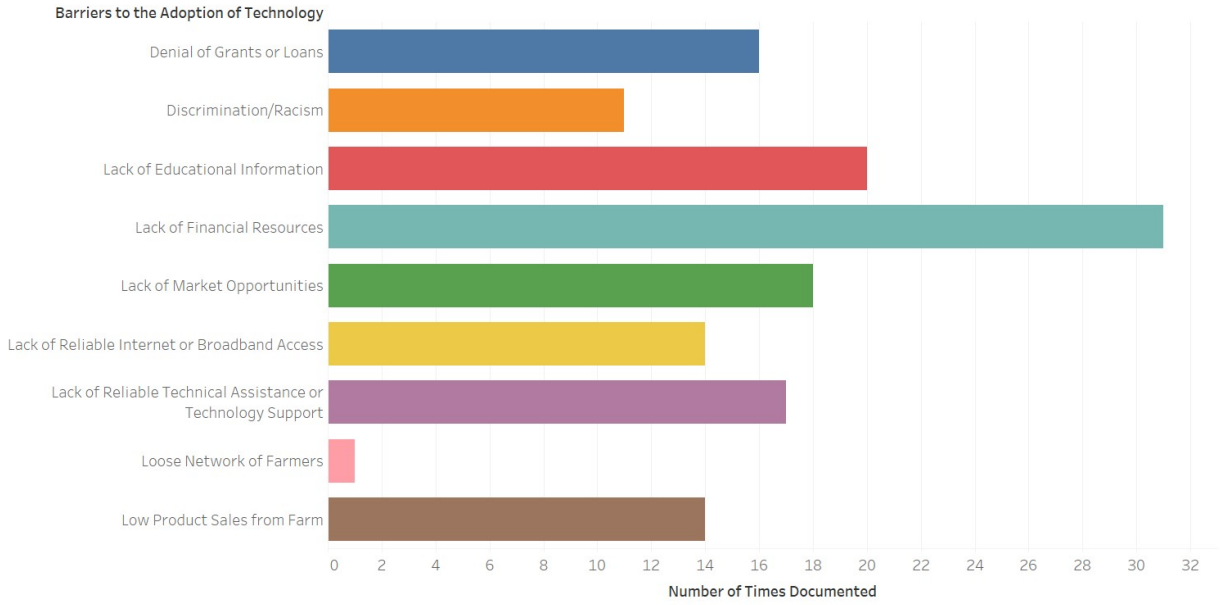
Technology currently used by black farmers in North Carolina

The majority of black farmers use traditional farming equipment in their practices, but four farmers responded by saying they're using newer technology like drones.

- Combines
- Drones
- Farmers' Almanac
- Greenhouses
- High tunnels
- Internet (computer/tablet/cell phone)
- Local USDA/FSA and NRCS Programs & Assistance
- No-Till Compost Introduction
- Sensors
- Simple Tools
- Spreadsheet/Field Notebooks
- Tractors
- TV/Radio/Newspaper

Lists of concerns barriers for being able to use NASA's tools and technology

The most common barrier to being able to implement the use of NASA's tools and technology is not having financial resources. Although the tools are generally open-source, financial resources are needed to cover the costs it takes for a farmer to learn to use them. The time it takes a farmer to learn to use technology equates to time lost harvesting and marketing crops. Farmers who are uncomfortable with learning and using new technology need financial resources to pay other staff to learn and use the technology.



Other barriers cited include the following:

- The availability of adequate and free mapping software
- Inability to afford the latest equipment
- Lack of access to new technology
- Reliable internet access across the farm
- Surveillance culture
- Unsure what technology works best
- Time commitment needed to learn new technology

The acquisition of tools, technology, and equipment is costly, but desperately needed to be profitable and resilient against fluctuations in precipitation and temperatures that farmers are experiencing. One advantage of using NASA's data and tools is that they are open source.

Outcomes

Through this work, we have outlined equity and environmental justice issues faced by North Carolina's African American farmers. We have identified barriers that exist which make the use of NASA's tools difficult to address these environmental problems. Our recommendations to NASA about this community's needs and desires for adoption of the agricultural tools and technology include:

1. **Recommendation: Train extension office agents on NASA's tools.**
   County extension agents were unaware of NASA's tools and technology but very enthusiastic about learning about them. These agents interface frequently with the farming community. They have built trust with the population and often meet the farmers

where they are. If county extension agents get up to speed on NASA's agriculture tools, more farmers will become familiar and eventually, more comfortable, with using them on their sites.

2. **Recommendation: Make adjustments to existing tools.**
    - **Crop Monitor:** Make the Crop Monitor interactive. It would be nice to have the ability to zoom into a continent or country.
    - **CROP-CASMA:** Make it obvious what the normal soil moisture is, not just the deviation from the norm. Improve the resolution of the application's data.
    - **Western Water Applications Office tools:** The WWAO has tools for drought monitoring, flood forecasting, water quality, and water allocation. Making these tools available for use outside of the Western US will be beneficial.
    - **ClimateSERV**: Enhance this tool so that users can type in an address or at least type in a city, rather than draw an AOI. Some users may have difficulty in finding their exact location on the map.

3. **Recommendation: Provide data and tools at finer resolutions.** Farmers ideally want to be able to zoom and see data for their individual parcel.

4. **Recommendation: Simplify the usability and documentation for tools.** Make tools more easily accessible for use on platforms like smart phones and tablets**.** Links to YouTube Videos on how to use the tools would be helpful, particularly for farmers who are generally not familiar with mapping and spatial science.

Community Engagement Activities

A key component of the project was listening to black farmers and images from a couple of our listening sessions is shown below. During these sessions, we presented NASA tools, listened to their concerns, and had the farmers complete a survey. We also teamed up with outside experts during these sessions, including a County Extension agent and food system planners who provided ancillary information to the farmers. While there was a great deal of interest in technology, what we learned was that there are many barriers that will prevent widespread adoption with this community.

Calendar of Milestones Achieved

Milestone	Date
Assembled project team	10/2022
Performed literature review	10/2022
Identified farmers for participation	10/2022
Developed a survey with questions about equity and environmental issues of concern	12/2022
Administered survey to farmers	1-5/2023
Planned and executed a listening session in Raleigh, NC	1/2023
Coordinated a “racial equity in food & ag systems” training for all team members	1/2023
Interviewed black farmers in virtual settings	2-5/2023
Compiled and analyzed results from completed surveys	6/2023

Inclusion Plan Narrative

Metrics Tracked

Metric	Result
Support will be provided for the PI by senior staff who will provide resources and holistic mentorship with the goal of enhancing her professional trajectory.	Not achieved
RTI staff who are not from underrepresented groups will join in on any listening sessions held virtually so that they are given the opportunity to interact with populations they normally have little contact within the workplace (if the African American farmers are comfortable with their presence). This will allow them to get exposed to perspectives and cultural norms different from their own.	Achieved
The Diversity, Equity, and Inclusion trainings RTI offers will bring awareness to staff about the barriers that exists for those from underrepresented groups.	Achieved

RTI has required all staff to set a goal for "Engaging Inclusively". As part of the annual performance review process, all staff must demonstrate their understanding about the value of working with people from unique backgrounds. They must also discuss how they engage diverse groups of individuals for smarter ideation and decision making.	Achieved
Staff members' progress towards meeting RTI's mandatory "Engage Inclusively" goal will be measured as part of the performance review process.	Achieved
In the project reports, RTI will include details about the participation of staff who are not from underrepresented groups. Reflections from these staff about their experiences engaging with African American farmers will be described.	Achieved
Development of a Diverse Team: This project will lead to development opportunities for local, African American-led community organizations, allowing them to develop greater networks and provide mechanisms for them to continue building community capacity that they can cite in future opportunities.	Achieved

Progress Narrative

Staff members completed at least one Equity, Diversity, Inclusion, and Belonging learning through RTI's corporate training system. After attending, they documented what they learned and what actions they've taken at work as a result of what they learned. Managers increased their inclusivity awareness by completing one learning course focused on racial equity. They also documented what they learned and how they are applying it.

Listening Session and Project Experience Reflections from Staff

Erin Love, Research Economist.

"As consultants, we often act like experts. Our clients pay us to answer questions, and I think it's easy (and often expected) to fall into the pattern of acting like we "have the answers." This cultural norm can be a setback in situations where we (RTI as a large, historically white institution) are trying to build relationships with community partners who are black or who are not scientists. It communicates that we are the experts instead of communicating how much we value the expertise of community partners.

As a white researcher participating in this project, I learned that it's important to step back from the stance of having the answers and to explicitly invite other perspectives and experiences into the conversation at the outset. When presenting data that was collected by institutions that have a history of discrimination and racism (like USDA), it is important to state the limitations of the data, acknowledge that it likely does not tell the whole story, talk about history/context, and invite other perspectives/experiences before diving into the data itself. Our racial equity consultant did an expert job of acknowledging the context around the data in the training she provided to our team. Taking that training together was an important way for our team (both researchers and community partners) to build trust and a shared language and understanding around racism and history of racial trauma as it pertains to the history of agriculture in the U.S. I learned how important relationship-building is to set the groundwork for high-quality, collaborative scientific work with community partners.

Kibri, thank you for your leadership on this project. You provided clear technical guidance around tasks deliverables. You scheduled regular meetings with organized agendas. You responded to partner input during meetings with curiosity, grace, and encouragement to share more. You built rapport and strong working relationships with our community partners (to the point where they saw us as a resource for other projects they were working on). I absolutely feel

that the project was more successful with a black woman leading it than it would have been otherwise."

Chrystall Davis, Environmental Economist.

"Analyzing the viewpoints of real black farmers who were able to provide input based on their own personal experiences provided an essential perspective that is oftentimes disregarded in favor of those in academia and research. Furthermore, considering black farmers emphasized how racism colors and influences all aspects of society. I believe that the intersection of climate change, agricultural economics, and racism is not always considered because logically, they really should not be very much aligned geographic context. If an area is 50% black and 50% white and there is a drought, the logical result should be that an equal portion of black and white farms are equally impacted. This is of course not usually the case and receiving input from these farmers provided context as to exactly *why* this isn't the case. A black farmer may have been allocated lower quality land that is not able to sustain itself as much during a drought. Due to way in which racism has restrained the economic prosperity of the Black American community, they may have not had access to funds that would allow for the widescale purchase of drought-resistant crops. A factory may be polluting the water near their farms as companies target low-income and minority communities for waste disposal sites. These examples, and similar situations, confirm that climate change is a race issue.

I am grateful that I had the opportunity to work on a project led by a black woman, specifically being and Economist and in the Center for Applied Economic Strategy where my project managers have all been non-black and mostly male. It is very much not uncommon that I am in meetings where I am the only black person, female, and/or both, so I felt very inspired seeing a successful black woman doing great work in the environmental field. I also think that it is extremely important to have a black person leading a project centered around the experience of black people."

Appendix

Communications: Publications

Project Award Announcement: https://www.rti.org/announcements/nasa-awards-rti-research-grant-strengthen-black-farming-community-north-carolina

Listening Session Announcement: https://www.linkedin.com/posts/kibri-hutchison-everett-646b051b3_flashbackfriday-blackfarmers-raleighnc-activity-7024734858430070784-eJdK?utm_source=share&utm_medium=member_desktop