By Yao A. Foli

What percentage of your work is citizen science? How has this changed over the years?
Every aspect of my project is possible through Citizen Science, from promoting rural education, environmental justice, and sustainable agriculture. This is one of the reasons I am interested in learning even more about citizen science and focusing on a career path in citizen science. My visit home has been full of community education, interviews, and meetings with community leaders about noise pollution, food justice, and water quality. Throughout the interviews and conversations I've had with community members, I noticed the recurrence of practices in food production that could be harmful. Some solutions adopted by many farmers are perilous to people and the environment.

This pandemic is an opportunity for us to learn about environmental injustice, food injustice, and environmental degradation. It encourages us to come together, work together, and find a solution to challenges. Through co-creation we can change the wrong process and ethics that lead our community to impoverished and unhealthy living situations. The introduction of Citizen Science and STEM can play a vital role in informal science education and engagement in my community. Through common sense, science education and traditional ecological knowledge, in combination with the scientific process, we will strengthen my community environmentally and promote quality public health.

Excess use of toxic chemicals in farming
There is an excessive use of toxic chemicals in food production in my community. It is used for weed control and to enhance crop growth, and food storages are also full of chemical interventions. I have interviewed farmers using community-based participatory research methodologies. What do you grow? What do you use to grow your crops? What are the challenges you encounter during growing seasons? What approaches or strategies do you use for solving problems?

The use of toxic chemicals in farming is the most common solution. This is sad to find out and requires attention.
It is not only what we eat that impacts our state of health, it is the holistic approach or methodology used in farming: from seed selection, land preparation, cultural practices, weed, and pest control, harvesting, storage, and transportation. Due to competition in local markets between imported farm produce and local farm produce, food quality and food justice is not a priority for local farmers. Nine out of ten farmers use the toxic chemicals in food production. A young farmer told me during a conversation, he uses chemicals "to save time and increase his yield". This use of chemicals in farming is a threat to healthy food for all.

Where do they get the chemicals from?
The increased use of chemicals in farming is skyrocketing in my community. These approaches have turned to be lucrative for some people investing in selling all kinds of toxic chemicals to suit farmers' needs. Local farmers only see one side of the impacts of these toxic chemicals. Lack of product knowledge is a big problem. Sellers of these toxic chemicals do not educate local

farmers about the hazardous effects of these chemicals. How can a community help itself, strengthen public health, and save the environment? Informal science education can support traditional ecological knowledge and promote a better and healthier lifestyle through community citizen science!

Bushfires

Bush burning is another crisis that farmers encounter every year. Who causes these fires? It is difficult to pinpoint who is responsible for these bushfires. So far, if he or she is not caught in the action, her or she remains a pin in a haystack. Some farmers burn the top grasses to provide a clear space for plowing or planting operations, while some bushfires are caused by hunters.

Who suffers when there is bushfire? Both micro and macro soil organisms face the consequences of the bushfire, Also, air pollution is impacted. The destruction of soil life slows the natural progression that enhances soil fertility. Long ago we used to farm without chemicals. This is a conversation we need to bring back among local farmers through community environmental education and engagement. Lack of information and education on environmental justice and food justice is problematic. Every year a lot of ants, millipedes, and centipedes that help in creating a good soil structure are burnt. In addition to creating fire belts with fire resistant plants along the boundary using citizen science to collect data about best practices would play a major role in understanding the importance of organisms and their function in our ecosystem. Identifying and understanding how ants are beneficial to soil fertility will change the perspective of hunters and farmers. I want children in my community to start identifying and understanding their environment to create better stewardship.

Water quality

Lack of waste management in combination with water pollution is another health risk that has not been paid attention to in certain parts of my community. Many houses have no access to piped water and toilets. I watched it with my eyes how polluted streams and rivers get when it rains heavily. Particles of garbage that are dissolved in the runoff water find their way into community water sources. Waterborne diseases are tasteless and unseen.

Due to lack of water via well at Ndor, I decided to get water from the known and everlasting stream called “MANA.” The stream is known to be a shrine and controlled by a spirit. There are no shoes or sandals allowed around the water. Bathing, washing, or the use of soap is prohibited by the spirit. In the water there are many mudfish and water snakes. You can see the catfish in the water where grandma is fetching water! It is the dark spot. These are the representatives of the spirit of the water. The stream has never run dry no matter how dry the season is. The mysterious Mana is in the valley of a swampy area. Everyone thought most of the surrounding swampy areas had gone dry due to extreme heat and human actions, but the Mana is still flowing like the River Nile!

On top of a small hill on the side of the rough road, some community members decided to use the roadside as a garbage dump. You will not see anyone actually dumping there, but you will see the piles of dumped garbage. It is believed that some people wake up early and discard their garbage there, and some people get rid of their garbage on their way to the farm. This is a busy

road that the community living on the mountains and people from the Bla, Kpeme, and Abansi (a three-town community) use for their farms.

Why do we sit aside and allow this kind of irresponsibility as a habit and accept it as a norm in our communities? It is time to co-create policy and research and education programs!
Using Citizen Science to support and help find answers to questions by involving the community in research projects within our community is the answer. When my community is involved and participates, this is a form of education. The state of our community's public health depends on how effectively our community preserves, conserves, and protects the environment that feeds and employs us. How does a community push themselves to better understand and follow best practices, and in this way improve sanitation and good health?

Ndor Eco Village is working in conjunction with NYU professors and students on a water collection and water quality project in my community in Ghana. I have visited all the local water sources and observed the sanitary conditions, held meetings, and interviewed the community members to better understand how we can improve water quality and what policies could assist us to achieve clean water. Ndor Eco Village and the NYU students will be doing water testing next year to identify contaminants and pollutants in our water sources.

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Myra has been working with Foli “Chacha” Yao, founder of Ndor Eco Village in Ghana as part of an independent study with Professor Vanessa Harden. This project is one of the unique projects being explored in the IDM.Grow program.

IDM.Grow is an integrated program committed to promoting sustainability and social justice within the design field by providing students the opportunity to actively engage in an impact-led design process. This program connects students with real stakeholders who are experiencing existing challenges related to agriculture and food access.