Speech by Dr. Agnes Kalibata to the U.S. National Academy of Sciences Upon Receiving the 2019 Public Welfare Medal

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Introduction

Thank you for that warm introduction. I appreciate the kind and generous words.
I want to thank the National Academy of Sciences for this award. For a scientist like me, recognition from this incredibly prestigious and important institution is a great honor.

My being here today is proof of possibilities. Possibilities that become real on my continent through agriculture. I grew up as a refugee and actually attained my PhD while I lived in a refugee camp in Uganda. Agriculture is how I got here. Agriculture sustained my family, but it was not about food. It got my family out of poverty. And I am happy to say that my country Rwanda and a few other countries in Africa are awake to the tremendous power of agriculture to move massive numbers of people out of poverty.

That is what I want to talk about today. About how agriculture has shaped my life and that of many other Africans. And why I believe agriculture is the key to building prosperity in Africa. I have seen this from the point of view of a child growing up on an African farm, as a minister of agriculture, and now as the head of the Alliance for a Green Revolution in Africa (AGRA).

Growing up on a farm, and getting far away from it (or not)

I should start by telling you that I have a complicated relationship with agriculture. Many of us from Africa do.

When I was 18 years old, I came home from school to visit my parents. Like most other people on my continent, my family made a living from agriculture. We had a small farm where my parents grew beans and maize and kept a couple of dairy cows. By working this small plot, and selling the surplus, they had earned enough money to send me and my siblings away to a good school.

When I arrived, my mother was out in the field. She was weeding a crop of beans. So I picked up a hoe and joined her. But when my father came home and saw what I was doing, he was very angry. He said, “Don’t ever do this again!” He said he was not sending me to a good school to see me working a crop of beans.

I am sure most of my peers and millions of our age mates across Africa grew up hearing this. If you talk to professionals in many Africa capitals today, most of them heard something very similar from their parents. “I’m not paying your school fees so you can work on the farm; I’m paying them so you can go to the city and find a job.”

While almost all of our parents never wanted to see their children follow in their footsteps in farming, we went to school because they farmed. We had food on our tables because they farmed.

While farming gave our families opportunity, it was considered a career of last resort. It was what you did when you had no other options; and in their eyes, it was a poverty trap.

Now I don't work as a farmer. But I'm not as far removed from a farm as my father might have hoped. In fact, I am drawn to agriculture because I know something today that I didn't know then: that agriculture, and specifically science-based agriculture has the power to eliminate poverty and more—**it can ensure our farmers, collectively, become the engine for our continent's economic growth.**

Why agriculture is critical to the future of Africa

Agriculture is critical to the future of Africa for three major reasons: it is the source of livelihood for 70% of the population - most of whom till small family farms; it contributes, on average, 25% to national GDP; and, growth in agriculture is 11 times more effective at reducing poverty than growth in any other sector.

Let me tell you a story that illustrates how **important agriculture is for the future of Africa.**

About four years ago, I met Fatima, a widowed farmer in Tanzania. She had recently obtained seeds for a much-improved variety of cowpea, which I think Americans call black-eyed peas. They were developed by a young African scientist who had studied plant breeding with an aim of improving the crop for farmers in her village. With these new seeds, Fatima's harvests increased dramatically, and she earned a nice profit when she sold the surplus in her local market. But it was such a bittersweet success. She said to me: "If you had come with these seeds earlier, I would not have married my five daughters off at a young age. I would have sent them to school to get a good education."

Those words have stayed with me. They have stayed with me because any of Fatima's daughters could have been me. They stayed with me because they were real as I saw my friends' parents struggle with these same choices (or lack of choices). More importantly, Fatima's words help me put in perspective the urgency with which we need to move to reach communities with solutions. Solutions that we already have.

I am telling you Fatima's story so that you understand how quickly farmers can progress; it only takes a season or two of access to appropriate science for lives to change. But it also reminds me that every single day we delay in using science to improve food production in Africa, families will continue to face terrible choices. Like I said, any of her daughters could have been me. This keeps me awake at night. It keeps me moving. It keeps me working even when my energies are low.

Science as the root of my story, and of Rwanda's and Africa's success

And when I think about Fatima's story, I reflect on everything that needs to happen to get her that better seed. At the heart of it is science. But it's more than that— it is science closely connected to the people and places that desperately need our innovations.

Farmer-centered science

I acquired my PhD though a partnership between the University of Massachusetts, the International Institute of Tropical Agriculture (IITA) and the Rockefeller Foundation. I was

part of a team that did research on pests affecting crops that are important to Africa. While it might sound like basic work, finding solutions to pests and developing improved crop varieties are a good match for a rain-fed farming that is practiced in different agro-ecologies in Africa. They are critical to addressing basic food production challenges that our farmers face and make a big difference for farmers like my parents and the people I grew up with. Those of us involved in African agriculture should respond to Norman Borlaug's famous 'take it to the farmer' call. It is the only way science will have meaning.

Bringing science to policymaking – Key to Rwanda's success

The work I did as a scientist was a strong foundation for my work as the Minister of Agriculture in Rwanda. And for what I am doing now at AGRA. It helped me understand all of the many different challenges our farmers face, and what they need to succeed. And as you know, science also teaches you how to engage complex problems. Instead of being overwhelmed, we learn to break it down, explore its different components--and then carefully seek out solutions that are supported by objective evidence.

My work in Rwanda took me into the field where I quickly learned something very important: all of the innovations developed by scientists, however good, would be useless—unless farmers had an incentive to adopt them. **Because our farmers are not interested in charity or agriculture as a social program, they want a decent income from their work; like all of us.**

While I got to be a minister because of my scientific background, it quickly became clear to me that boosting yields and providing a surplus on small family plots on the very steep hills of Rwanda required more than science. It required drawing on the knowledge and expertise of the farmers themselves accumulated over decades. It also required a functional policy environment. **Without the right level of policy environment, science cannot go very far.**

Rwanda had this figured out which is why it is at the center of my recognition here today. It had a number of policies that were critical to moving the agriculture sector forward. Three were extremely essential

1. Agriculture is among the first three priority sectors that the government invests in
2. A land tenure system that has all 1 million plus parcels of land titled to individual owners providing security of tenure
3. Land consolidation policy that completely reimagined small holder farming moving it from individual household subsistence units to collective large-scale market oriented farms.

Alone, individual farmers had little power. But together, they are a market force equivalent to thousands of hectares. Consolidation also made it easier for the government to efficiently provide the farmers with the support they needed including with improved seeds, fertilizers, extension advisers, structured markets and post-harvest services--like places to process or store their crops after harvest. As a result of these benefits that came with consolidation, farmers had the incentive needed to invest in their farms and increase production

It was this combination of good science with good policy that allowed large areas of Rwanda to move from food insecurity to food security in just 5 years. And that's how agriculture

played such a big role in helping 2 million people-- about 20 percent of the population--lift themselves out of poverty.

I want to underscore that I was also fortunate to be working for a President who valued science—as long as it was connected to policies that produced results. And I have taken his lessons to my job at AGRA, where I work everyday to support ministers of agriculture across the continent who will not get the funding their farmers need unless they can deliver results.

My work in Rwanda and at AGRA has convinced me that Africa too can benefit from the science the rest of the world now considers commonplace like a good yield due to a superior crop variety. However, for this to happen, we scientists have to move out of our comfort zone and engage with the people who will use our innovations. That includes private sector companies who can translate our discoveries into practical, affordable products. And it includes political leaders and policy makers who need a wide variety of expertise and technical support that I often struggled to find. We must measure our success with real-world impact, because there are real people like Fatima, whose life choices depend on these innovations and how quickly we deploy them. Sitting in our labs and getting the work going is not enough.

Science needed now more than ever

African agriculture needs good science now more than ever before. We're seeing the effects of climate change—cyclones in Southern Africa, long droughts in East Africa, rainy seasons—once very reliable that now never arrive. In Kenya, we have something called the "long rains" that should run from March through May. It should be happening right now. But this year, the rains never came. We are also seeing higher temperatures, and that alone can reduce yields of major crops.

We need scientists to develop a wide range of options that will enable farmers to cope with these changes. And we are already seeing what is possible, like new types of maize that can tolerate drought, rice that survives extreme flooding, and disease-resistant cassava that is enriched with vitamin A. I applaud the work the CGIAR has done and I know there are a few of you in the audience here today. I also applaud the Bill & Melinda Gates Foundation for being a trusted partner in the work to increase access to better and improved crop varieties for poor communities in Africa and other developing parts of the world.

We also need more reliable climate forecasts and better strategies for adapting to specific growing conditions. With the support of the Rockefeller Foundation, my team and I recently negotiated a partnership between AGRA and a Silicon Valley start-up called Atlas AI. They are using artificial intelligence and machine learning technology to process large amounts of satellite imagery that can monitor crop performance right down to the farm level. The goal is to use this data to help countries that work with to plan better and design interventions that are suitable and responsive to the needs of communities of smallholders. It also allows private sector led solutions to respond to individual farmer needs. The combination of data and the mobile telephony will certainly transform the lives of smallholder farmers. I like the scientists at Atlas AI because they are committed to developing innovations that can be used to solve some of the biggest problems of our time.

Call to action: Scientists must be advocates

I want to see more scientists engaging with policy makers and the private sector to understand how their incredible talents can change lives.

In my world, the late Norman Borlaug is a legend because he did more than develop new varieties of disease-resistant wheat. He's a legend because he went to the agriculture ministers of India, Pakistan, Egypt and many other countries and convinced them these new wheat varieties could help save millions of people from starvation. And they convinced their prime ministers that Borlaug was right.

We also need to constantly remind our citizens that science always has been, and it always will be, the animating force of agriculture. When we invest in agriculture research, we are investing in a better future for humanity. Think about the scientist who developed the improved cowpea for that farmer in Tanzania. Did she know that that this seed alone could determine whether or not a young girl would become a child bride or an agriculture minister? That's the power and the responsibility we carry.

Science has dramatically reduced poverty in the world today. But our work is not finished. Science must help us harness the power of agriculture to bring wealth and hope to places in Africa and other developing parts of the world where there is now mostly poverty and pessimism.

Conclusion

In closing, I want to thank the several partners that played essential roles in making this award possible, particularly for the role they played in supporting my country Rwanda in its recovery over the last 25 years. It moved from food insecurity to a largely food secure nation despite climate change. I thank my President, H.E. President Paul Kagame, for the vision and leadership he put forward to chart the way for all of us.

I am proud to be part of a team at AGRA that is working to scale-up agricultural innovations that work from science to practical solutions for farmers across the continent. I am particularly grateful to our funding partners, the Rockefeller Foundation, the Bill & Melinda Gates Foundation, USAID, DFID, BMZ and others that have seized the opportunity to support AGRA as an African institution that has the capability to bring science and the political economy of delivering science together. Through this partnership and with the governments in these countries we hope to reach millions of people with the ability to at least double their yields and incomes in the next few years. I am grateful to the Rockefeller Foundation for supporting scientists like myself acquire the skills we have. I am also grateful to the professors who invested their time and energy in me.

To the National Academy of Sciences, I want to thank you again for this incredible honor and for this opportunity to share this story and how I believe others will soon be repeating and even surpassing it to help achieve what has been dubbed Africa's Century. My late father did not want me to be a farmer, but he would be very proud and maybe a little surprised to see where agriculture has taken me, and where it took our country. I am grateful to him, to my sister who is here today who has been my moral and professional compass, and to my husband and children; Kayl and Kelia, who have put up with my days of absence.

I believe agriculture can do great things for millions of Africans. Together with my ever dedicated team at AGRA – sons and daughters of African farmers, and with the support of our amazing partners here in Washington, across the United States and around the world, I am confident we will succeed.