

**HUMAN AND INSTITUTIONAL CAPACITY BUILDING IN AFRICAN AGRICULTURAL
DEVELOPMENT AND FOOD SECURITY**

Panel Moderator: Gebisa Ejeta

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Panel Moderator

Gebisa Ejeta

2009 World Food Prize Laureate

Panel Members

Her Excellency Dr. Joyce Banda

Former President of the Republic of Malawi and
Founder of the Joyce Banda Foundation

Berhanu Abegaz

Executive Director, African Academy of Sciences

Martin Kropff

Director General, International Maize and Wheat
Improvement Center

Brady Deaton

Member, Board for International Food and Agricultural
Development; Chancellor Emeritus, University of Missouri

Introduction

Per Pinstrup-Andersen

2001 World Food Prize Laureate

Welcome to the next panel. I am sure that we can all agree of the importance of human and institutional capacity building, of which of course gray matter infrastructure will be a part for African development and for food security. Could I ask the panel members to please join me up here?

President Banda, Professor Abegaz, Professor Kropff, and Professor Ejeta – Please join me on the podium.

The moderator has asked me to introduce all of the panel members at this point, and then I will turn over the floor to the moderator.

Her Excellency Dr. Joyce Banda, the past president of Malawi, is an entrepreneur, is an activist, is a politician, is a philosopher. She was president of Malawi from 2012 to 2014. She founded the Joyce Banda Foundation International, which seeks to transform villages through its five pillars, namely, women’s income, education, maternal health,

including HIV and AIDS, leadership, and rights. Currently, the Joyce Banda Foundation International has benefited more than 1.3 million people in Malawi. President Banda has also been very active on the international scene. She was instrumental in the formation of such organizations as the African Federation of Women's Entrepreneurs, which is currently running in 41 African countries, accounted for the economic empowerment of women in Africa, and American and African Business Women's Alliance, of which she served as the first president.

On a personal note, I have been observing. I went to Malawi many years ago, and I've been visiting from time to time, and I'm observing the progress that has happened in Malawi in agriculture, and I congratulate President Banda on the tremendous progress made during her tenure.

Professor Abegaz – Berhanu Abegaz is the Executive Director of the African Academy of sciences, a position he has held since 2011. Previously, he was professor of chemistry at the University of Botswana for 17 years and Addis Ababa University for 21 years. Professor Abegaz has contributed to the rapid growth and development of the economy that we have witnessed during the last few years.

During this time the Academy has secured recognition by the African Union and by NEPAD, the number of fellows and, in particular, women fellows, has increased significantly. Professor Abegaz has assisted in articulating the three important functions of the Academy, namely, recognizing excellence, providing think tank functions, and engaging in programmatic activities. One of the achievements of the Academy under his leadership has been the development of partnerships with local funders and the establishment of the Alliance for Accelerating Excellence in Science in Africa.

Professor Kropff, Martin Kropff joined CIMMYT as the Director General in 2015. He came from Wageningen University and Research Center, where he was President and Vice Chairman of the Executive Board for almost ten years. He earned his undergraduate degree in biology at Utrecht University in the Netherlands and a PhD in agricultural and environmental sciences at Wageningen. (Bear with me for one second while I get my instructions here. Okay.) From 1990 to 1995, Professor Kropff was the systems agronomist at ILRI where he led an international program with national agricultural research systems and universities in nine Asian countries on systems research and simulation for rice production. After 1995, he served successive roles at Wageningen University, UR, including as Director General of the Plant Sciences Group and on the Executive Board. From 2013 to 2015, he was a member of the board of directors of the CGIAR.

I have been invited to also introduce Brady Deaton. Brady, you are here, welcome. Brady Deaton is a member of BIFAD. He's a Chancellor-Emeritus at the University of Missouri, and he has been appointed by President Obama to BIFAD. And that is all the information I have on you, Brady, but next time I introduce you, I'll make sure to do a better job.

It is now my privilege to introduce the moderator of this panel, Gebisa Ejeta. Gebisa is a good friend of mine. He's the 2009 World Food Prize laureate. He is a distinguished professor of agronomy at Purdue University. He received the 2009 World Food Prize for his sorghum hybrids that are resistant to drought and the devastating weed, Striga. For those of you who are not familiar with what Striga can do to a crop, Google it. It is a tremendously important contribution that Gebisa has made in this area.

His work dramatically increased the production and availability of the food supply for hundreds and millions of people in Sub-Saharan Africa. Combined with his persistent efforts to foster economic development and the empowerment of subsistence farmers through the creation of agricultural enterprises in rural Africa. Gebisa has had profound impact on lives and livelihoods on a broader scale across the African Continent.

Gebisa, I'm not going to turn the floor over to you, and I look forward to an exciting panel discussion.

Gebisa Ejeta

2009 World Food Prize Laureate

Thank you very much, Per.

The title of our panel this afternoon is Human Capacity and Institutional Building. The speaker that we listened to, the keynote speaker at noon, if anyone is to ponder on what it means to building human capacity in the continent of Africa – what you get when you combine God-given native intelligence, a good education and opportunities--that's the kind of educational and opportunities provide. And so we've got plenty of opportunities to create those kinds of individuals in the continent of Africa.

I wanted to provide some background on this topic. I think in 1949 President Truman, when he declared the Point 4 Program and there were four different points during his inaugural speech that he included. Point 4, *We must embark on a bold new program for making the benefits of our scientific advances and industrial progress available for the improvement and growth of underdeveloped areas.* The Point 4 Program was really the beginning of the Global Development Assistance Program. It was a program that had in its basic tenet the ideal of helping poor nations help themselves – that was really the beginning of technical assistance programs, because before 1950, any technical assistance program that went on in the continent of Africa was really a colonial arrangement.

And so since then, for nearly 35 years, we had development assistance programs. The Point 4 Program went on from 1949 to 1961 until President Kennedy created and enacted the Foreign Assistance Act that also provided and opened the U.S. Agency for International Development. So those 35 years of the work of the Point 4 and USAID program was really the ones that built the foundation for human capacity and

institutional building not only in Africa, in many of the developing countries, giving them the foundation upon which to build their nations.

Twenty-five years, we've had some decline since the mid-1980s until seven years ago when we really had the beginning of the Feed the Future Program that really resuscitated the Development Assistance Programs and energized a lot of what we hear today about agriculture and food systems that have really had a lot more boost in energy in what we do today.

Legacy programs that have built human capacity and institutional strengthening programs in developing countries are of course the U.S. Agency for International Development and Point 4 Program before that have trained hundreds of thousands of students from all over the world, and the Canadian International Development Program, CID, and IGRC, also a Canadian program that really was a very creative capacity building program in the continent of Africa. Rockefeller Foundation, a legacy program again. Many of you mentioned the Rocky Docs and the Ford Foundation. These were prestigious fellowships in many developing countries that really generated the first round of leadership in developing countries in the '60s and '70s. and these programs trained a lot more people. The World Bank also is a legacy program because your arrangements with government, the World Bank also educated and built institutions in many developing countries. The British Overseas Official Development Assistance Program, also a legacy program. And Scandinavians, Norway, Sweden in particular have trained a lot more people. And today, I would say programs in Germany and Netherlands are really training; they've providing a lot more fellowships for developing country students that come and study in Germany and Netherlands that we do here today in this country.

And so these programs over time have provided poor developing countries the necessary foundation for building their institutions. Even at the weakest, USAID continues to provide the leadership. Even today there are a number of programs. These are just examples of human and institutional capacity development programs that the U.S. Agency for International Development runs. Out of that, iAGRI, Innovative Agricultural Research Initiative, that provides an institutional building support for Sequoia University in Tanzania, is a good example of an institutional building in higher education.

I just want to make a point on why we have really organized a panel, and really nothing is more foundational for development and development assistance programs than having native capacity at the human level as well as at the institutional levels to really take more experiential learning forward and that way also to benefit from development assistance greatly. Otherwise, it becomes an activity of external programs coming in and out, but the traction that we generate cannot be as impactful as it would be if internal capacity could take advantage of it and really benefit from that.

And so the new development landscape in Africa is encouraging, that we have exceptional expansion in infrastructure development, primarily through the assistance

of the Chinese and the World Bank and now the African Development Bank. I think the world and the African Development Bank are joining, but the incredible infrastructure expansion in the continent of Africa in the last ten years has given a lot of us hope.

And there is also improving microeconomic policies that encourage foreign investment, development initiative for indirect investment in the continent. And at the same time Africa is also beginning to invest directly internally by institutional building exercise. And so there is a resurgence of external agricultural development assistance programs.

These are really the primary institutions that are necessary for development, although as agriculture expands, the variety of value chain programs and institutions in which human capacity and institutional strengthening is necessary. One of those that I really would like to take as an example, and it was mentioned this morning, is inasmuch as plant breeding and economic development activities are going on, Africa is still struggling to establish a functional seed system, for example. So many of these have opportunities for intervention.

I think the challenge for Africa is to recognize the indispensability of tertiary education and making serious investment in building an institutional infrastructure. So I think one last point I would like to make is Africa needs to benefit from lessons from China, India and Brazil. Each of them has done it differently, but each one of them, the common denominator is they all invested systematically in human and institutional capacity building in their countries to really drive the development process that has taken place to bring about transformative change there.

Again, this is indeed my last point, that in the growing complexities of policymaking in a more globalized world, I think a well-educated, well-informed generation of African leaders to lead and inform its people and to design and implement their programs is really necessary. When you have good leaders that are well prepared for the position and really have the mindset to work with other nations and other programs, it's a lot, much easier, I would say, to deal with a leader like Akin Adesina than it is with leaders like Robert Mugabe, if I may say that.

So with that, I would move on and give the panelists the opportunity. I thought maybe I would start with you, Brady. You and I had worked on the Commission to Study for U.S. Agency for International Development and Human Institutional Capacity Development. And if you may say a few sentences about that and really indicate the kind of advocacy that you have for youth programs and human capacity and maybe get us started that way.

Deaton Gebisa, thank you, and let me say how honored I am to be with Your Excellency President Banda and other members of the panel, and to be with my colleague in BIFAD, Gebisa Ejeta who brings his own gravitas to these important discussions, particularly with regard to Africa.

I have to begin, Gebisa, by picking up your point on youth because of what we have seen today. And I commend Ambassador Quinn for the fabulous attention he's given to bringing 400-plus high school students and others from around the world here who participate in essay contests. I recall as a youngster writing those conservation essays each year as part of my development, and it reminded me, standing out there the many times I've stepped onto the stage as Chancellor at the University of Missouri and greeted and congratulated each graduate as they left the University. I was standing up there watching the 400-plus students come in, and I realized we're looking at our future. We're looking at the leaders, the artists, the innovators who will lead us into the future. And so I congratulate this convocation, the World Food Prize, and what it means to us with regard to the specific questions of human and institutional capacity development.

Because if you think of the youth of Africa, one of the most rapidly growing parts of the world today, in every village across Africa, there is a future artist, there's a future scientist, there's a future leader, there's a future entrepreneur who will shape the future that we are walking into as we speak. And there could not have been any more inspiring discussion of that context and the inspiration for youth in the two lectures we heard just prior to coming in here – President Kim of the World Bank, President Adesina from the African Development Bank. Each spoke to that urgency that Martin Luther King brought to the issue of civil rights. Each spoke to the promise of youth and the scourge of the earth that Roger Thurow has talked about, of child stunting – getting rid of it because we have so much more to look forward to, and we can do better, and we can do it with a sense of urgency. And I'll come back to that in regard to land-grant issues and the university issues in just a moment.

The study then that enables us to address this issue in a context of looking to the future was actually suggested by the first time. When I became chair of BIFAD and Gebisa and I and others – there were seven of us – sat down with Rajiv Shah, then administrator, he said, "Would you please look at USAID's programs and human and institutional capacity development, analyze and make recommendations to us about what you see that can be the most promising for the development challenges we face in the world."

And that's the study we undertook at that time. And Gebisa was chair of the board, the committee that led that study, and Vic Lechtenberg – I give him great credit at Purdue University – came in and worked with us, came in with a small group to examine the issue of institutional capacity development in countries of the world and the role the United States has played in that. And we came away with a strong affirmation of the work that had occurred under Title 12, which began in 1975 as part of the Foreign Assistance Act of 1961 that President Kennedy had signed into law.

We found when we examined the historical record that the program of institutional linkages between universities in this country and universities abroad had led to a profound change in the capacity of science and technology and education worldwide, particularly in Asia and Africa. And we focused attention on recommendations that would expand that strength and enable us to bring the latest, working with our colleagues in Africa, particularly, for the focus of this discussion, to ensure that we're addressing the cutting-edge issues that make a difference, that we are looking at the latest revisions in curriculum that can provide the most advanced education for Africans that we could possibly develop jointly.

And as part of the mission we have had in our own country of research extension and outreach and curriculum development, it's that outreach in extension that led to massive civic education and 4-H programs. I was explaining to a private sector, a private university leader in the last week about how we used our university system to inspire a whole generation of new leaders and scientists in the United States, and we did that in many ways through 4-H. There are many programs represented here in the Borlaug Foundation and the Borlaug LEAP fellows, and the African young leaders that have been brought to his leaders are all examples of this.

But I said, "Think of what a difference it makes if you spend your formative years making that pledge, your head to clearer thinking, your hands to greater service to your community, your heart to greater loyalty, and your health to better living for your club, your community, your country and indeed the world." That's the 4-H pledge.

So it's that inspiration that can be brought, that wholeness of building a human being that is desperately needed in so many parts of the world and is clearly one of the great challenges that our speakers today talked about for Africa. So those linkages with universities can be powerful tools for moving us ahead in the world.

Ejeta Thank you very much. Martin, if I may come to you and if you may take a few minutes and share with us the kind of human and institutional capacity building that the CGIAR traditionally has conducted and the kind of activities that you do now.

Kropff Yes. First of all, starting with this, this morning we have seen the main challenge, I think, and the vision – that's where it starts when you talk about capacity building. It's basically what our keynotes have indicated. Africa must be able to feed itself, in spite of quadruple population size in the future. So that means also a real strong research infrastructure, not just academic research but academic research and research of delivery as well – So basically the "science for impact," as I call it all the time.

And I think in CIMMYT but also in all the other CG Centers, Norman Borlaug started when he was in Mexico, directly also, training people, training people, training people. And we started with breeders, with the Pakistani breeders, and we all know what happened afterwards. But later on, it was also capacity building in the broader sense because we need a framework.

Many people think about just training or a PhD or whatever. But I think we have individual capacity building – that's training, short training courses; it's academic training courses. It's institutional capacity building with organizations, for example, the National Agricultural Research Systems in Africa that are developing themselves very well, and the CGIAR is supporting them very well, but also broader in society. Because if you have an institution and you have individuals and it's not embedded in society, for example, linked in extension, nothing is going to happen as well.

Now, what is also very important is that you don't train people just in a discipline. Sometimes you have a breeder who's just breeding, but you also have to be connected to society, because what I think is important is that everybody realize that each innovation has a technological component and a socio-economic component; and you need an integrated approach to really have impact in the end. So this is also very important in terms of the capacity building, which we do in the CGIAR.

And examples are, for example, the courses that we have but also the infrastructure. In Africa, the CG sends us, I think 12 or 13 of our CG Centers are active in Africa. In most African countries we have large offices and large institutions with infrastructure. We share that infrastructure with the national systems. For example, the big screening facility for maize lethal necrosis, the large facilities for double haploid breeding, for example – these are infrastructures, also for capacity building, and the initial systems have benefit from this.

Now, one of the main things that we discussed this morning that you heard in this presentation, and also of Jim Kim – scaling up, impact at scale. You have people talking about zero hunger. The only way you can do that is, I think, through the private sector. These days, you team up with the private sector.

For example, our breeders generate together with the other researchers the new seeds, but who is getting them to the farmers? And that's so essential, and we see that we building up right now in Africa a complete seed industry from scratch, sometimes very small businesses that grow very fast. So you also train people in entrepreneurship – how do you set up a seed business? Next to the seed business, because with seeds only you get nowhere as well.

So we need small-scale mechanization to get people out of hand labor. You see, too many people, especially women, sometimes with babies on the back, working in the soil, which is bad labor. With small machinery, two-wheel tractors, for example, the whole system can change in a village. But then you need also a service provider, so somebody has to become an entrepreneur, and we train them. And you need also people that can maintain the equipment.

At the same time, you develop basically jobs in a completely way – jobs that are decent jobs, jobs of the future, interesting for young people. And we heard this morning also from Jim Kim how important it is that, when we are changing agriculture, we change jobs as well. What I always say – Agriculture in Africa, but also in other countries (I'm from the Netherlands), is the kickstart of the economy. In times of financial crisis, the agricultural sections, the agrifood sector, I must say, is the sector that keeps on going.

So it's capacity building in several ways, but it has to be in connection. It's not just individual trainings – they are important – but it's also institutional, and the CGIAR, all the centers together, CIMMYT but also all the other ones are really focused on helping the national system, because it has to be demand driven.

This morning also we heard supply-driven technologies are not working. You need to have it making demand driven. And that's why it's so encouraging to have so much good leadership in Africa, many ministers of agriculture that we are working with that are really focusing also on making sure that the CG Centers support the national systems.

Ejeta Thank you very much. Professor Abegaz, your leadership at the African Academy of Sciences that focused in an array of programs, if you may share those with us.

Abegaz Right, thank you. Let me begin by thanking Ambassador Quinn for inviting me to be part of this highly distinguished panel. I would like to... I recognize that we are here perhaps foundations, the funders, etc., and I was told there is a need to express our African voices from the continent.

In that regard, there was no louder African voice than the speaker during the lunchtime, and I can hardly match that. But he's a banker, and I'm from the African Academy of Sciences. We work with the African Union as its strategic partner, and so it's perhaps important to project a continental perspective on the issue that have been raised.

Research and development and innovation are important, but what are the facts in the ground? The average number of R&D personnel, scientists,

engineers, etc. per million population, for the African Continent is only about 85. The United States, I believe, is over 3,000, and Korea is 4,000-plus. So you can see really the paucity of R&D personnel.

Perhaps to respond to this and perhaps also to meet the demand for higher education, there has been a huge expansion in higher education unprecedented in any other continent in the world. Perhaps the leader in having thought of this in the beginning was a country, the federal government of Nigeria, when in the 1970s they increased the number of universities from about six or seven to something like 30.

Now, Ethiopia, the second most populist country had only 7 in 2007 but over a short period has increased to about 64 accredited nongovernment and government universities or colleges awarding degrees. In Kenya, there are about 70 now, private and public institutions. And there is interest to increase this by 20 in order to have a higher education learning and research center in every county.

So this huge expansion you may think..., and in spite of all this, Africa enrollment in higher education is still one of the lowest in the world. But this sudden expansion has resulted in an inevitable dilution of quality. And you see in the institutions who are no longer ever to focus on research. PhD level staff members are really in very low numbers.

You will see then a growing youth population; 60% now is under 25, rather not being very inspired in this declining quality, and therefore they would like perhaps to go elsewhere to get good education. The number of really well-educated people leaving the continent is about 20,000 a year now. These are the situations. So what is being done about it?

If I go back to Nigeria, which started a long time ago, there was a recent study which puts spots on the countries if an institution has published at least 30 papers a year. There were 10 in South Africa, 10 in Egypt but 20 in Nigeria because of that early start in expanding. It took time, but quality is beginning to come.

Then the other efforts that are being made are 15 universities appear in the top 1,000 in the world, and these 15 universities have started an Alliance for Research Universities in Africa, and they are taking responsibility to really develop the cadre of highly qualified personnel in research and development. Likewise, the World Bank has Africans in terms of excellent universities with 19 of the countries participating in Western Africa and 22 in Eastern Africa. This is really grand, the World Bank giving the loans and the countries also investing money. For the need for focusing on quality is becoming important. At the Africa Union level, there's a pan-Africa investing in five regions of the world and highly devoted to post-graduate

education; and they are struggling, but I think the ideas are lofty. And at the academy we are trying to help them to what is needed to hire quality staff from anywhere in the world.

So I think just for the last part for this question, I'd like to say that Africa is the only continent over this century that will quadruple, quadruple the population. All other regions are not going to increase. So there is really a need for investing in the workforce, not just of Africa but of the whole world, in doing this. Thank you.

Ejeta Thank you. President Banda, thank you for your patience sitting through all these academics talking. And I understand your passion is working with farmers, and you had indicated to me the strongest educational support that is needed is to educate the farmers and build the farming institution – if you'd share that with us.

H.E. Banda Thank you very much indeed, Mr. Moderator. Allow me to thank Ambassador Quinn for the invitation and particularly the honor to be sitting here with these distinguished scientists. I ask myself – how come I'm invited to be there. So I felt that I was invited, not only as somebody who has been a leader but also as somebody who has spent most of my adult life fighting for empowerment of women and youth. As I was introduced, they said that the Joyce Banda Foundation, which is about 20 years old, has spent those years providing income in two households through agribusiness, believing that when there is income into the household, the girl child in that household shall go to school; because when the resources are low, the girls are not going. The second pillar is girls' education, because if they don't go to school, they get married early, and they die giving birth. That's why the third pillar is maternal health and HIV and AIDS.

The fourth pillar is, having been a leader myself, I know that when women get into leadership they focus more on issues that affect the household, women and children. And finally, the issue of women's rights is a cross-cutting pillar into those four pillars. I'd like to say how proud I am to see so many young people. Last year I had an opportunity to speak at their event, and I am told that we are going to meet again tomorrow. Because I believe that our young people here are not the futures of tomorrow but the futures of today.

Distinguished ladies and gentlemen, as said, the other panelists have said, 54 countries of Africa – most of the countries are very small, like Malawi, Rwanda. In those countries, for example, Malawi, until independence in 1964 we were only four million people. As I speak, we are 15 million, and we have been told that in 2050 we shall be 50 million. On the same land, to produce enough food, therefore this panel is timely, to build the individual

capacity as well as the institutional capacity, to make sure that you, on the same land, we produce more and we produce enough for our families.

Secondly, there is desperate need for technology, innovation and research to produce food in agriculture on the continent of Africa. For information, the research is showing that the average age of the African farmer is 60, and yet 65% of Africans are young people. I truly feel that it's a lost opportunity if we don't pay a lot of attention in engaging the young people right now, right now starting from their school curriculum, make sure that agriculture is on the agenda in their mind. As Dr. Adesina, the president of the African World Bank said, most of the time in a rural setup, agriculture is looked upon as an occupation for those that don't go to school. But if we start early with our school children, with our youth, encouraging them to get involved in agriculture, to look upon agriculture as a business, then we will benefit as a country. But for that to happen, we need to build the capacity to make sure that they are interested, we are trusting them.

I don't know if you know this, but in Malawi I think it's only 27 percent of young people that have access to any computer. By the time they see a computer, they're adult, may be in high school if at all. Here I see two-year-olds play on the computer. So that is for me very sad, because it means we are living a whole generation behind, because there will need to be the technology for them to engage in agriculture, to find markets, to send messages. But if they have no access to even phones, even computers, then it is going to be a disaster.

Third I would like to highlight the challenge of the lack of extension services. You find that in most areas in Africa and in Malawi in particular I know for sure that most people have no access to extension services, and therefore they don't know how to grow the crops. They don't know how to use the modern technology. They don't have modern, improved seeds and inputs.

The research that is being conducted, very good research, commendable work by our scientists is not getting down to the people. And then sometimes when they design these modern technologies, they don't consult the end user. So you find that, for example, in one country they designed the energy-saving cocas. The women didn't using them, because they didn't like using them. I truly believe that sometimes even if people aren't educated, they know what they want and they know what they need, and it would help very much to send resources if our scientists took the trouble to consult the end users.

Distinguished ladies and gentlemen, one other worry for me is climate change. You find that in a country like Malawi where water was the greatest resource that we had, I am being informed by experts here in the U.S. that

we have lost about 60% of our water resources in two years, which means when I was in office, I introduced what I called, a two-crop-a-year initiative. Now, if we don't have enough water, there's no way we are going to irrigate or have a second crop.

Finally, I wanted to point out before I hope you'll give me another chance to talk about what I think are the solutions. But post-harvest wastage is also what is...In Malawi alone, it's 40%, and I don't know how much more food is being wasted in the rest of Africa. After working so hard, after harvesting, they don't know how to ensure that that food is protected. And I was talking to a potato scientist, especially sweet potato production. Up until now at 66, I didn't know that you can keep potatoes for a year. I am told here in America it is possible. These are simple things that we ought to know. Because we grow a lot of potatoes, and then they go to waste.

Mr. Moderator, let me stop there.

Ejeta Thank you very much. Maybe taking a lead from you, I think we're running out of time. So maybe recognizing that there is an array of human and institutional capacity building that is need in a continent like Africa, both from production to harvest and post-harvest and through all the value chain, the institutions and the capacity that we need to build is much. But if you would each take your own advocacy for the kind of human capacity and institutional capacity that is necessary, and now that we have all stated the issues and the problems, if you may identify one or two solutions that you see – small hanging fruits that you can leave as a message with the audience. Martin, let me start with you, and then we move this way.

Kropff Yeah, there's a lot of low-hanging fruit, but I think that the key is that we have a coherent approach of all the capacity building efforts that we have. For example, the CIMMYT we have 40% of our work is in Africa, so what we are now developing is, we call it the CIMMYT Academy, which is basically because we have all these training activities. Each project has a training component, a capacity building component. We want to make it a coherent sect of activities. And also we want to train many more PhDs, because my colleague on the right side also indicates universities are being built in Africa. We need to train more professionals in Africa, also to train the young people as well. And as CGIAR Centers, we can help there, of course, together with universities, universities in Europe and U.S. but especially also together with African universities.

So training at all levels and make it a coherent set, individual, institutional and countrywide.

Ejeta Thank you very much. Professor Abegaz, one minute.

Abegaz Okay, one minute, yes. So let me focus on one. I think there is a need to shift the center of gravity for a leadership in African research and associated capacity building to African governments and scientists. I think this is a very important point. And, you know, a lot of times African governments have been blamed again and again for not supporting R&D. But if you look, the change over 20, 25 years, the profile of African leaders is changing. There are more scientists and really eloquent speakers who are advocates who believe in science. I think this is important. Even there are 24 African billionaires. Some of them are even coming to help, and I can mention a few of them.

So I think it's a good time when we should not lose momentum. The final thing is that any collaboration between African institutions and institutions outside the continent, I really would like to put in a strong request that this be looked at on the success measure how over time African leadership instead of African following, and African leadership emerges. That must be a good way to the end, if to promote intra-Africa collaboration while at the same time get quality input from Northern institutions.

Thank you.

Ejeta President Banda, I can't have you leave without you giving us some word about the future of African leadership.

H.E. Banda Thank you very much, Mr. Moderator. I believe that the future lies in the hands of Africans themselves, and I'm talking about political will. If across Africa the government takes responsibility to ensure that research is continuing but the findings are getting to the people, the people are getting extension services, the African Union taking the lead to unite Africa and initiatives across Africa, ensuring that African countries are sharing good practices and lending from one another, this is critical going forward.

Finally, I wanted to say that there are so many countries doing well, and I want to congratulate those that are doing well. But I believe that true agricultural production goes side by side with good governance. So fighting corruption, making sure that our resources are safe for the benefit of agriculture and food security on the continent of Africa.

Finally, I want to say that, as we go forward and we achieve food security at household level, we must also realize that Africa needs to educate its own households in behavior change, because men are eating first, best and most, and women are growing the food, storing the food, processing the food, cooking the food, and eating last and less. Thank you.

Ejeta Dr. Deaton, a final word for us?

Deaton USAID and working with APLU have conducting studies that demonstrate that the highest rate of return on education, higher education in the world, is in Sub-Saharan Africa. So it's a matter of how we do it. It's essential for the processes that are underway there – tertiary education, extension, as President Banda has implied at least. I think it's so vital that it's going to be done one way or the other. Africans are taking it in their own hands to do this, but it needs support. And we have recommended to our USAID that we engage in much more linkages with the institutions of Africa. And it has to inspire the youth for the future leadership that we have in place.

Ejeta Thank you very much, and I would end with the way I started. I think the needs for development assistance are great, and the variety of needs, but there really isn't any more foundational investment that can be made, other than starting with human capacity building and strengthening the institutions in Africa so that development assistance can really pay the dividends that is due. And, ladies and gentlemen, with that, I thank the panel for the great job all of you have done. And thank you for your patience and understanding.