



**MPEP** SEMINAR SERIES  
Exploring Frontiers in Inclusive Market Development

**What Will It Take To Transform African  
Agriculture 2013-2030?**

**Presentation Transcript**

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*Moderator:*

Our topic today is what will it take to transform African agricultural. And by transformation, we're talking about two processes, and I'm sure the economists among you know this, but we're talking about transformation meaning the shift from a subsistence-oriented, diversified production to have a more specialized and market-oriented production.

But agricultural transformation, as I'm sure you know, is part of a larger process of structural transformation, and by this, we're talking about a situation in which agriculture becomes a smaller proportion of the economy as other sectors grow. So just to know that in transformation, we're talking about both of these.

And want to ask some questions about transformation. Is transformation happening in Africa? And if so, how? Is it a bottom-up process, or what some people call a small holder-led process? Or is it as some others argue, can large players better drive transformation? Can the very poor, these people who are cultivating very small pieces of land, like .2 to .5 hectors, can very poor, small landholders contribute to and benefit from transformation? And if so, how?

And then what can we, as development practitioners do, to facilitate transformation, and to make sure that it's linked to poverty reduction.

So we have an esteemed panel of economists today, and the first one is Jerry Wolgin, and Jerry is from the Africa Bureau. Jerry is an international economist. He is working in the Africa Bureau Office of Sustainable Development. And I believe that Jerry started the Office of Sustainable Development in the Africa Bureau. He also was a lead economist at the World Bank and has a PhD in economics from Yale.

Tom Jayne from Michigan State University has been working with USAID and doing research for USAID for many years. And he's a professor in the Department of Agriculture, Food, and Resources Economics. He's in the International Development Department, as well as African Studies. So his research mainly focuses on agricultural policies and public investments, and how they can contribute to sustainable and inclusive development.

David Atwood is from the Bureau for Food Security, and he is the food security policy advisor in that bureau. He also was a director of the Office of Sustainable Development in the Africa Bureau. He also was a graduate at Michigan State University. You can see all these people are related to each other. And was a former deputy assistant administrator in the Bureau for Europe and Eurasia.

So for our closing today, we are very thrilled to have Eric Postel here, and

Eric is E3's assistant administrator, and he brings to this position 25 years of work in private sector development and working in emerging markets. And also, a key priority for Eric as the E3 assistant administrator is to elevate broad-based economic growth as a top priority for our US development efforts.

So before we begin with our esteemed panel, I wanted to get an idea of what all of you think about this topic. So we're going to pilot some new software to get everyone's perspective on three questions. Joy.

*Female:*

So for those of you in the room, get out your little cheat sheet for Poll Everywhere, and have your cell phone ready. Please have it silenced. It does help our participation. And for our Webinar audience, you should see instructions on your screen right now.

Know that there are no additional charges to vote, but standard text messaging rates apply, so that depends on your cell phone carrier.

And Poll Everywhere is really serious about your privacy, so I won't know your number. No one else know your number unless they're your friends, and you'll never receive any other messages outside of this event. And when you're voting, know that capitalization does not matter, but spelling and spacing do so make sure your auto correct doesn't do anything funny with your votes.

And – yeah.

*Moderator:*

So our first question is in general, are the best prospects for poverty reduction and economic growth in Sub-Saharan Africa to be achieved through an agricultural strategy that focuses on (a) small holder-led development, (b) medium-scale or larger farms, and (c) relatively equal emphasis on small holder-led and medium or large-scale agile leadership.

*Female:*

So if you haven't already, if you think the answer is (a) small holder-led development, text E3 small to 22333. And Webinar folks, you can click on the link and after you've clicked, please join back to the Webinar so you can participate.

Yeah, and we'll give you a couple more minutes to vote.

*Moderator:*

Well, I think it's interesting to see that the balance seems to be the big vote, but small is at least 50 percent of that, and kind of gaining here.

*Female:*

There's 48 right now for equal. Let's give everyone a couple of more minutes before we move to the second poll question, so get your votes in. Okay?

*Moderator:* Okay. The second one.

*Female:* Mm-hmm.

*Moderator:* So the second question is what percent of African smallholder farm households can pull themselves out of poverty directly through agriculture, assuming a balanced and supportive environment? Would you guess 10 percent (a), 25 percent (b), 50 percent (c), or 80 percent (d)?

*Female:* And for those of you on Webinar, please remember to refresh your browser so you can vote, again. And for everyone in the room, text that keyword to 22333. We'll give you a couple more minutes.

*Moderator:* Everybody seems to be going through toward moderation of some kind. Okay. So it looks like 25 percent is holding very well over time, and remember with our first one, we also saw a moderate vote of equal emphasis on smallholder led, and large or medium.

Shall we start our third? Okay.

*Female:* Let me give you a couple more seconds to wrap up your votes and we'll move to the third one.

*Moderator:* Okay. So our third question is a true and false. Smallholder agricultural generally produces most stable crops at lower cost than large-scale farms, true or false? So it looks like there's a pretty overwhelming vote for false.

*Female:* We have about 50 votes for false, and 22 and growing a little bit for true.

*Moderator:* Okay. Well, good to know where our audience stands. So let's begin with our panel. Jerry Wolgin is going to begin, and he's going present some macro data on the evidence of transformation and poverty reduction spanning the years 1960 to 2011, so he's basically going to be talking about the past and the present.

Tom is going to look at some more disaggregated data, focused on rural households, and he's going to look at poverty reduction through a different vantage point. And he's going to include farmers with those very small landholdings, like .2 to .5 He's going ask how will transformation occur, and what are some policy levers for facilitating it.

And David Atwood is going to look at the mixed relationship between agricultural growth and poverty reduction in Africa. He's going to look at the challenges of facilitating growth that is inclusive, inclusive with those people with those very small landholdings. And he's going end by

reviewing some policies and investments that he would argue will foster inclusive agricultural growth.

So let's start with Jerry.

*Male:*

Okay. Does this work? Do you know if it works? Okay, great. I have one major goal here which is to be as esteemed after I talk as I seem to have been before I talk.

*[Laughter]*

So we'll do a little quick poll on that and see how that works. Okay, let me go back for a second. What I want to talk about is what really is happening, and put this into a data-rich – I don't know if "data-rich," but talk about what the empirical data say about structural transformation.

We are living and have lived for the last 50 years in the period of greatest structural transformation in the world. The world has changed everywhere dramatically, and one of the main result of that is that there's been substantial reduction in poverty all over the world. A lot that driven by China, but not only China. It's taking place everywhere.

Now by structural transformation, we mean the reduction in the role of agricultural in the economy, the decline of agricultural as a share of the economy, the reduction in the number of people who get their earnings from agriculture. We mean substantial urbanization, and finally, we mean, a change in fertility. Those four transformations are what we define as a structural tuition. So let's look at the data.

So first is a share of agricultural in GDP, Sub-Saharan Africa is the second one, the blue one. And you can see all over the world the share of agriculture in GDP has been declining to between 20 percent for Africa, and South Asia, and down to 5 percent for the other 2 regions.

In terms of population growth rates, there's been a demographic transition everywhere except for Africa. Now you can see that there's been some decline in African growth rates as a result of a decline in fertility, but a long way to go before Africa reaches the levels of population growth of the other regions, and Africa's population is expected to double over the next 40 years. So by 2050, there will be 2 billion people living in Sub-Saharan Africa, and there will be 400 million people living in Nigeria, and that will be more people living in Nigeria than live in the United States.

As far as urbanization, you can see that Latin America has had substantial urbanization. All of the other regions are increasing. East Asia and Pacific is now above 50 percent South Asia and Sub-Saharan Africa,

which actually is more urbanized than South Asia.

In terms of total world population, what happens is people move out of agriculture, but the share doesn't decline. The total doesn't decline. The share declines. The total doesn't decline until many, many years, and you can see that for East Asia, the share of people living in agriculture has begun to decline, but in Africa and South Asia, the number of people living in rural areas has continued to increase and probably will continue to increase for another 30 or 40 years. And then, finally, here's data on crude birth rates. You can see that Sub-Saharan Africa is much higher than the rest of the world.

So just a little bit of information on what's happening recently in Africa. This data is from 1996 to 2011. 1996 represents sort of a turning point. From '96 on, a lot of countries began to grow rapidly and by 2000 or so, a lot more, so it spread. These are data points. There is some kind of correlation between the growth of agriculture on the bottom, and the growth of GDP on the top. It's not surprising, agriculture is part of GDP, and a lot of some of the discussion about agriculture is the way in which it contributes to GDP growth. But the point is that most African countries are somewhere around the quadrant, which is positive agricultural growth, positive GDP growth, and a lot of them are above five percent in terms of agricultural value added and four percent in terms of GDP growth.

And the, finally, poverty. There's not a lot of data on poverty. Not every country has two poverty points, so I got whatever countries had – the World Bank had data on, two surveys that showed the proportion of people in poverty, and looked at the change in the proportion of people in poverty and as you can see, almost all those dots are below the line, so if you're below zero that means poverty has been declining, and then across the horizontally is the rate of agricultural growth. While there's a line there, that's a very weak correlation. You can't run a very strong regression against poverty changing agricultural growth. But the point is that in Africa, there's been substantial agricultural growth across the board and there's been poverty reduction even in countries that one wouldn't have expected it.

I'm done. I hope you also remain \_\_\_\_\_.

*Male:*

Okay. Good morning, everyone. All right. Is it doing okay? All right. Thank you. All right. We won't make you vote on these questions, but I have four more to put onto you. The first one is can we learn something about how this transformation – that Jerry and Jeanne have talked about – how that's going to occur, and how will we know if we're moving in the right direction over the next five to ten years towards where Africa wants to be in 2030. That's the first question.

The second one is why is it that we're seeing this weak relationship between agricultural growth and poverty reduction? Jerry just, his last slide showed that there is a weak relationship, but it's not nearly as strong as we thought it was 20 years ago. 20 years ago, people were saying, if you could get agricultural growth moving in these primarily agrarian societies that you would see some positive impacts on poverty reduction. So I'd like to discuss a little bit why that may or may not be occurring.

Third issue. You've already voted a little bit on this. Is it realistic to expect the bottom 50 percent of the smallholder population to be able to pull themselves out of poverty through agricultural, try to present a little data to inform that question. And then the \$64 million question is what to do about it and what's the role of government in this process. So let's launch right in.

Why is there this variable relationship. So let's take two countries that we have a fair amount of data to look at. Malawi, which as you all must know has gotten a lot of press in the recent five to ten years about its input subsidy program and the apparently dramatic impact that that's been having. I'm going to present some information that questions that. There has been major growth in agriculture in Malawi, 47 percent over the last decade, and Zambia next door, has also had great production growth for agricultural. But look at the numbers for Zambia in terms of poverty reduction. It's basically been flat, hovering right under 80 percent for the last decade. So a doubling of agricultural growth, basically, with no impact on rural poverty. Why?

In Malawi's case, even though agriculture has also grown remarkably, rural poverty has actually increased by one percentage point. So let's look at part of the reason for this.

The first one has to do with farm structure. What we did in all of these countries was to disaggregate the rural population according to their land size. So we ranked all of them. Kenya's case, there were probably 1,300 households. In Zambia, it was more like 8,000 households. We rank all of them in terms of their landholding size and then break them into five equal pieces. And what comes out of that, as you can see in this figure is that about 20 percent of the rural farm populations in each of these countries is virtually landless.

We think of Africa as a land-abundant place. Asia's is a land-constrained place. But the data is showing us that a significant part of Sub-Saharan Africa's population has very marginal farms even up to about the third quintile, so that's up to about 60 percent of the households have less than one hectare of land. It's not till you get up to the top 20 percent, that 5th

quintile that you start to see landholding sizes that can really produce a surplus. And here's where most of the commercialization is focused in Africa, on the top 20 percent.

This is a graph of Zambia that shows, again, it disaggregates commercialization by farm size. And down there at the bottom, you can see the blue line, for example, are all the farms that are between zero and one hector of land. They basically haven't participated in this growth that Zambia has experienced. Neither has the next farm size, one to two hectors. Basically, it isn't till you get up to over five hectors that these are the people that have actually benefited and basically driven the growth process that Zambia has experienced. The interesting thing to know is that that group of over five hectors is three percent of all of the farms in the country.

And this kind of pattern is one that we see in every single country, so in Malawi's case, it turns that half of the marketed maize surplus that's been produced in Zambia comes from two percent of the farms, two percent of the farms that count for five percent of all of the marketed surplus, so it's extremely concentrated. And then the bottom groups are really not – they're not so far, being a part of this process.

Now why might that be? Bear with me on this one. It's a bit of a detailed one, but I think that the insights are important from this. So 8,000 households in Zambia. What we did was disaggregate them according to their farm size, and then put on weight, so this is a statistically representative survey that was undertaken by the Government of Zambia, and they were able to extrapolate to the nation.

So as you can see, the farms that are between zero and 1 hector, 616,000 estimated households which account for just under half, 41 percent of all of the farm households in Zambia, between 1 and 10 hectors, there were 33 percent of the farms and so forth. So you can see the distribution of farms size from this.

Now let's look at who was accounting for the rapid growth in agriculture between about 2005 and 2010, and what it shows is that for farms that were between zero and 1 hector, there was an additional 150 kilograms produced of maize on each farm on average, but that rapidly increased to seven tons for households between five and ten hectors.

It's this – let's see if I can – I hope it's this. Yeah. Okay. So the farms that were between 5 and 10 hectors on average, produced 7 tons more over that period, and the ones that were from 10 to 20 hectors, produced 6 tons more. So once again, you can see that the farms that were really driving this growth were on the bigger side. But keep in mind here that the

bottom 2 farm sizes here account for about 75 percent of all of the farms in the country.

Okay. The next thing that I think is interesting is that the government was implementing an input subsidy program in this country, and let's take a look at how that was allocated. So here, we can see that the government on average distributed 24 kilograms to households in the bottom farm size, 69 kilograms on average for farms between 1 and 2 hectares. But it was distributing 345 kilograms of subsidized fertilizer to households in here.

So some very important political economy problems emerging are where the expenditures that government was making in support of agricultural were being captured primarily by bigger families.

And then the last column here which I think I interesting is who's accounting for the surplus. You can see from once again, that even though agricultural growth rose dramatically, there was only 135 kilograms per farm that were being contributed by this smallest farms going up to 15 tons for farms in the bigger category. Okay?

So the upshot from this is that the growth process, that the public sector by its own investment strategies is pretty much encouraging a pattern of growth where the largest farms are the ones that are benefiting from the growth, and very little seems to be trickling down to the bottom.

*Male:* \_\_\_\_\_ but on that. But if the fertilizer is spread equally on land, what's the ratio which – I'm not a specialize, but what's the ratio of that per hectare, because maybe that's different than the way you're doing the division.

*Male:* It is different, but it's still skewed towards the bigger farms.

*Male:* Okay.

*Male:* It is. Okay. Seems to be stuck. \_\_\_\_\_ need a little help here. It's frozen. Okay. Let me just go on. The Zambian government's public \_\_\_\_\_. Let's go to the pie chart, okay? Great. Okay. So this shows how the public sector is spending its money in support of a agriculture.

FISP was the input subsidy program. As you can see, 30 percent of all of the government's expenditures on agriculture go to that input subsidy program. The FRA is the marketing board of the Government of Zambia, so between it and the input subsidy program, 90 percent of everything that the Government of Zambia is spending in support of smallholder farmers is accounted for by those two programs.

So one might question, where's the expenditures on R&D on agronomic

research, on farmer extension, irrigation systems climate change, and so forth, gender issues. That's where the little sliver of the extra ten percent is located right now. So this says something about what is actually happening in terms of government expenditure as opposed to what actually may need to happen to get that transformation moving.

One last graph here that I think is very interesting is this shows the fertilizer response rates that smallholder farmers are getting. So the X-axis shows how many kilograms of fertilizer – sorry, how many kilograms of maize these households are getting for every kilogram of fertilizer that they put in the ground. And the midpoint there is about 16, so the average farmer's getting 16 kilograms of maize for every kilogram of nitrogen nutrient that they apply in the ground. But as you can see, there's quite a number of farmers, about 30 percent, who are getting well under 10, and that's a very, very low response rate. In fact, it's very difficult to make fertilizer a profitable proposition for farmers when you're getting that kind of response rate. The economics just doesn't make it profitable.

So one of the goals that I think we need to keep our eye front and center on is the need to improve response rates. There's no disagreement that fertilizer needs to be majorly increased in terms of its intensity of use, but doing so is going to require having farmers be much more responsive than they are, okay?

Now the last graph looks policy. Fortunately, *The Economist*, and IFPRI have both done meta studies on which kind of public investments provide the greatest returns in terms of agricultural growth. And as you can see, policy is number one on *The Economist*, road investments, agricultural R&D. This is really where the action is up here in remembers of the payoffs to agriculture. They also ranked the same with regard to the payoffs to poverty reduction, policies, road investment, agricultural R&D, and so forth. The ones that are kind of down at the bottom have to do with subsidies.

Remember how in the pie chart that we showed you, how many governments are actually allocating their expenditures as opposed to what IFPRI and the economists are indicating give the highest payoffs. So with those thoughts, I think I'll move over to give the floor to David. Thank you.

*Male:*

Thank you.

*[Background talk]*

Okay. I want to start out thanking both Jerry and Tom for kind of providing us a really rich evidence base for these discussion and

grounding these discussions of agricultural change and transformation in evidence is really important.

*[Background talk]*

So my job is basically to kind of expound on what an agricultural transformation is likely to look like in Africa, and the answer to that is both pretty simple and somewhat complicated. So the simple answer to that is an agricultural transformation in Africa, which is already underway in a number of countries is going to look similar to the agricultural transformations that took place in the United States, in Europe, and more recently over the past two or three generations, in most parts of Asia and other parts of the world.

And what does that transformation look like? It's primarily small farmer based. It involves higher labor and land productivity. We're already seeing some of this, not as much or as fast as we'd like in Africa. Recent USDA study looked at this across many African countries. As a result of that higher labor and land productivity, farmers have more money in their pocket, and eventually, they use that money to do a few things. One of them is spend that money on local services and goods, and create off-farm income and employment linkages, as well as hiring more farm labor in some cases.

We eventually see an increase in mechanization. We eventually see larger and fewer farms. Eventually small marginal farms go out of business, although the United States' experience and elsewhere is that takes a long time for a lot of complex reasons that aren't all economic reasons. And then we see migration from rural to urban areas that Jerry talked about.

So that's the simple story. The complex story is how long does this take and how exactly is it likely to happen in Africa. And how long it takes is a really important question. If it takes too long, we haven't solved the poverty problems and we've created all sorts of other problems, and that's been the major concern in Africa over the past few decades, why is this taking so long? Although as Jerry pointed out, there's a reason for a lot more hope. There's a lot more things happening in agriculture now in past 10 or 15 years than the were in the previous 20 years.

There are ways in which the transformation can happen too fast, though. Transformation that happens too fast and the wrong trajectory wouldn't necessary be an inclusive transformation that led to the employment and income opportunities for both smallholder farmers and poor rural people.

So and just to come back to Tom's point earlier, policy and investment decisions by governments and by others, such as donors, can both

facilitate and accelerate poverty-reducing agricultural transformation, or they can impede in ways that actually can hurt poor people by closing opportunities for them.

To understand some of this, I want to come back very briefly to the point Jerry was making about absolute versus relative population and GDP. So we know that as a agriculture transforms, and we certainly see this a lot in Africa over the past many years, you get rural urban migration. You get a greater share of the population that is not rural, and a smaller share of the population that remains rural. But at the same time, even when that smaller share of population represented by rural people, the numbers of rural people continue to grow for many, many years, two or three generations into the Green Revolution in South Asia, for example.

So what does that mean? That means that part of an agricultural transformation to be economically, politically, and socially successful and viable has to generate jobs and income opportunities for that growing rural population that remains in rural areas.

Similarly, with success in an ag transformation and a growing economy, it is good and normal to see the share of agriculture in the economy decline, as Jerry said, but the absolute size of the agricultural sector, the absolute size of value add in an ag, ag GDP, continues to increase. An increasing ag GDP in absolute terms in and of itself will tend to generate more economic activity and for a certain period of time, more employment growth, more income opportunities for farmers and poor rural people.

So this just comes to kind of basic Food Security 101. Food security is about the major increases in food production that the world needs over the next 40 or 50 years. That is an essential part of success, economic, and political success in developing countries and in the world over the next couple of generations. But it is also all about access to food via income and employment opportunities. So food security is about caring both the about employment and income linkages, as well as food production.

So how do we get there? And here, it's really important to distinguish between causes of an agricultural transformation, and consequences of transforming agriculture. So, for example, why does mechanization increase in an agricultural transformation? Increasing output, increasing productivity in agriculture creates more demand for labor, and eventually that puts pressure on wages. When wages have risen enough, it becomes more economical for farmers, even farmers on the small end of the scale, to begin to mechanize. It's going cost them less and return them more if they mechanize at that point when wages have risen.

But you don't want to think about mechanization as a cause of the ag

transformation. It's something that will happen as long as markets are working right. We have a lot of examples in Asia where markets didn't work right, and when they started working right, people started buying small irrigation pumps, small tractors, and things like that. But treating that as a cause of the transformation is going to lead to problems that I'll talk about in a minute.

Similarly, as agriculture transforms, you get the most dynamic farmers who want to grow their farms, who want to increase land area, who begin renting in land eventually they want to buy more land, that's a normal part of the transformation process, and you get migration as a part of that process. Again, these are all consequences of a more productive growing agricultural sector.

We don't want to treat these as causes, though. And just one example to come back to mechanization, in much Southeast Asia in the '70s and early '80s, you saw proliferation of rototillers, and the reason that proliferation of rototillers happened was because the Green Revolution generated a lot more labor and demand. Eventually wages rose significantly. There were labor scarcity in some areas, and it made sense economically for farmers to start using rototillers. That was a good thing. That was part of the transformation process.

We're seeing that happen now, just in the past few years in Bangladesh, widespread use of rototillers in certain parts of Bangladesh for the same reason. The Green Revolution that happened in Bangladesh a generation or so after it began in Southeast Asia has now generated enough demand for labor that wage rates have risen and farmers are starting to use rototillers.

If we, USAID, and the World Bank, or the Government of Bangladesh, back in the '70s or even the '80s, had had a program to subsidize or push out or give away rototillers, that would have helped the farmers who received those rototillers, up to a certain point anyway, but it would have foreclosed significant income-earning opportunities for rural laborers who wouldn't have gotten hired by those farms, and it would have messed around with the labor markets and the mechanization markets.

So that would have been a situation of treating mechanization as a cause of the ag transformation, which would have impeded and slowed down an inclusive poverty-reducing ag transformation that we've seen in a very exciting way over the past 20 years in Bangladesh.

So, again, to make the story of ag transformation in Africa more complicated, what don't we know about ag transformation in Africa, and what's different from Asia and from a generation or two ago? Well, the

first obvious thing that people have talked about for years is Africa is highly diverse, very diverse cropping systems, very diverse landscapes, and limited irrigation, so this presents significantly greater challenges to the ag transformation, including a small farmer-driven one in Africa compared to Asia.

Also, how do farmers, especially small farmers, meet the new demands of globalization that Asian farmers in the '70s and '80s, and into the '90s, didn't really have to think about? Much more stringent demands, both to export or event to supply urban markets, if you're competing with food imports, much more stringent demands in terms of quality, food safety, and a range of new demands that the market is putting on all participants in these highly demanding markets.

And to come back to Tom's key question, which scale of small farms can adopt more productive technologies and specialize within small farmer spectrum?

And, finally, what policy levers can increase off farm employment beyond the natural progression that's going happen by agriculture being an engine of off-farm employment? Probably the country that had the greatest experience in doing this was China, that had very specific policies to generate off-farm employment.

So how will this transformation happen? To be very simple, there's a bad way, and the bad way is special treatment or subsidies for larger players, for mechanization, driving people off the land. And we're seeing there are some governments that are basically driving people off the land and selling some of that land to larger farms. That is not going to produce an inclusive poverty-reducing agricultural transformation, but it will produce an agricultural transformation, just not an inclusive one that reduces poverty.

And the good way is high-impact investments to increase small farmer productivity. The things that Zambia – just as one example, and we don't want to single Zambia out here, but Zambia, from Tom's chart clearly is not investing in better policies, R&D, infrastructure, market linking, small farmers to value chains. That's a virtuous trajectory which will generate new sources of income and employment, and new sources of demand for the labor of poor people in rural areas, both on farm and especially off the farm.

So and we need to be both confident that this transformation is underway and can happen, but kind of humble, mindful, and careful about how to make sure we focus on the right policies and investments to make an inclusive transformation happen. Thank you.

*Male:*

Great.

