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Motivating and preparing African youth for successful careers in agribusiness: Insights from agricultural role models

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Abstract

Purpose – The purpose of this paper is to examine the career trajectories of 66 distinguished African agricultural professionals in order to explore how agricultural education and training (AET) institutions can better motivate and prepare youth for productive careers in Africa's rapidly changing agrifood system.
Design/methodology/approach – Based on in-depth qualitative interviews with these role models, the paper explores the answers to two critical questions: How can Africa motivate its youth to consider careers in agriculture and agribusiness? How can AET institutions better prepare youth for productive careers in agribusiness?
Findings – Rural youth enter agribusiness careers in response to clearly perceived rural needs coupled with demonstrable profitability of modern agricultural and agribusiness opportunities. In contrast, urban youth embark on agricultural career paths in response to inspiring science education, particularly practical applications in biology, coupled with emerging awareness of the range of professional opportunities afforded by modern agribusiness and commercial agriculture.
Research limitations/implications – The study relies on the basic premise that seasoned, successful professionals – from the private and public sector – can offer useful insights into ways of improving job preparation training for the youth of today seeking careers in the food system of tomorrow. The approach assumes that the role models have both the practical experience and forward-looking vision necessary to identify key elements of preparation likely to benefit future job market entrants.
Originality/value – This paper relies on primary interviews with distinguished agricultural professionals from 14 different African countries.

Keywords Africa, Agribusiness, Youth employment, Agricultural education and training, Champions

Paper type Research paper

1. Objectives

Africa's youth will require jobs in increasingly daunting numbers. The continent's demographic bulge (Figure 1) poses a singular challenge of finding productive work for the 360 million youth, currently aged 0-14, who will reach working age in Sub-Saharan Africa over the next 15 years. Given current workforce participation rates, approximately 317 million youth from among this cohort will choose to enter the labor market over the next 15 years. Coupled with the retirement of up to 60 million older workers, these demographics imply a need for roughly 260 million net new jobs between 2010 and 2025 and 570 million net new jobs by 2040 (Kaneene *et al.*, 2015). Where can Africa's youth find productive work in such large numbers?

Africa's rapidly growing and changing agrifood system offers a unique scale and range of opportunities for absorbing large numbers of new labor force entrants.

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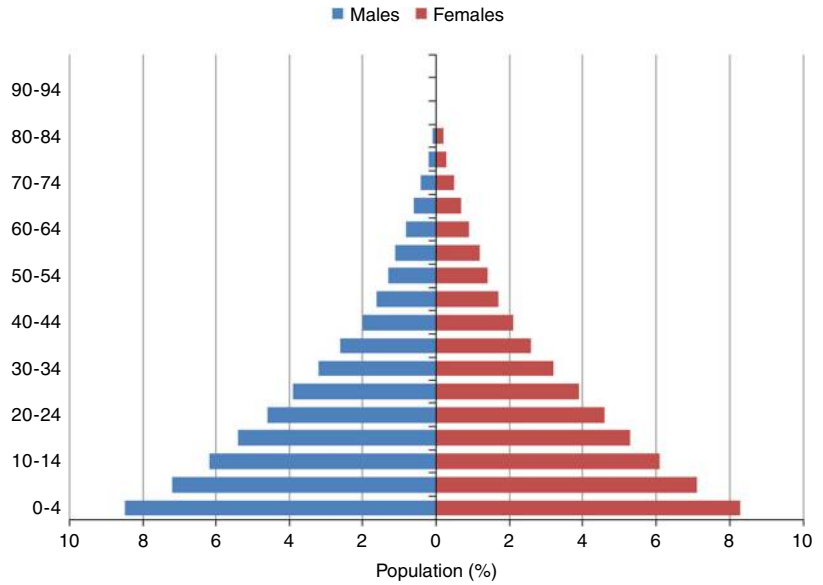

Source: http://populationpyramid.net/sub-saharan-africa/

Figure 1.
Population pyramid, Sub-Saharan Africa, 2010

Agribusinesses – including commercial agriculture, input supply and services, trading, processing, storage and distribution – offer possibly the largest job opportunities on the continent. Currently, agriculture serves as Africa's largest employer (World Bank, 2008). Looking forward, a recent study of African labor markets projects that two of the most significant sources of entry-level job growth over the coming decades will occur in agriculture and associated agribusinesses (Fine *et al.*, 2012).

Ironically, large segments of Africa's youth remain dismissive of agriculture and disinterested in agriculturally related careers, despite the sector's considerable growth prospects. About 40 percent of African youth entering the labor force over the coming decades will grow up in urban areas with little understanding or appreciation of emerging opportunities in commercial agriculture and agribusiness. Rural youth, though experienced in agriculture, often lack breadth of understanding about the food system transitions under way and the diversity of careers available in emerging agribusinesses. How, then, can African education and business groups help to motivate and prepare youth for productive opportunities in emerging agribusiness disciplines?

This paper explores how agricultural education institutions can help to address this critical double challenge. First, how can they better motivate youth to consider careers in agribusiness? Second, how can they more effectively prepare youth for productive opportunities in the agrifood system?

2. Methods

2.1 Insights from seasoned professionals

To answer these questions, this paper reports the results of interviews across the continent with distinguished agricultural professionals whom we asked to reflect on their own career trajectories and on the many structural changes under way in African agricultural systems. In light of these changes and their own experiences, we asked

them to suggest how agricultural education and training (AET) institutions might more effectively motivate and prepare African youth for productive careers in Africa's rapidly growing but rapidly changing agrifood system.

This paper reports the insights of successful agricultural professionals from 14 African countries about how to improve the relevance and effectiveness of AET institutions. It summarizes the experience, observations and recommendations from 66 African agricultural role models identified by the Modernizing African Food Systems (MAFS) consortium[1].

Like tracer surveys of agricultural education graduates, these interviews aim to gather insights about job market preparation from job holders themselves[2]. However unlike the typical tracer surveys, this study has not confined its search to graduates from a single training program, a single institution or to recent graduates. Rather, it focusses on recognized good performers across the agrifood system, many of whom have held senior positions, with career trajectories traversing multiple private and public sector career postings. They share the recognition of their peers, who consider them "champions" of agriculture.

The method resembles a "positive deviance" study from public health (Bradley *et al.*, 2009) in the sense that it focusses on gleaning insights from top performers to elicit clues about how to improve performance across the general population. In this instance, the investigation aims to identify practical steps AET institutions can take to better motivate and prepare youth for successful careers in agriculture, agribusiness and supporting institutions. The study relies on the basic premise that seasoned, successful professionals – from the public and private sector – can offer useful insights into ways of improving job preparation training for the youth of today seeking careers in the food system of tomorrow. The approach assumes that the role models have both the practical experience and forward-looking vision necessary to identify key elements of preparation likely to benefit future job market entrants.

2.2 Selection process

In April 2013, the MAFS consortium launched an international call for nominations for African Agricultural Role Models, defined as "individuals from Africa who have made an impact on advancing Africa's agriculture and food system development in any sphere related to agricultural production (crops, horticulture, forestry, fisheries and livestock), value chain development, finance, processing and policy." Members publicized the call through presentations at a series of professional meetings, e-mail contacts from the member institutions list serve directories and via the MAFS web site.

As outlined in the call for nominations, "Our goal is to identify a broad selection of highly effective agricultural and agribusiness professionals in order to understand what has enabled these top performers to improve agricultural and food systems in Africa. Following nominations, a cross-section of nominees will be selected from different fields for in-depth interviews aimed at tracing their professional trajectories and helping us to understand how Africa's AET institutions can better prepare future professionals for Africa's growing agricultural and food systems."

In all, the call elicited 82 nominations from 14 different countries. The MAFS internal review team vetted the nominees after reviewing nomination materials submitted for each of the candidates. This initial filtering aimed to identify the most outstanding prospective candidates in the following seven categories: commercial smallholder farmers; agribusiness; non-profit promotional groups; public policy makers; researchers; educators; and young agricultural professionals. Following this

initial vetting, the team contacted and conducted in-depth qualitative interviews with each candidate using the interview protocol provided in the Appendix. In 60 out of 66 cases, interviews took place in person. MAFS team members traveled to Senegal, Mali, Ghana, Uganda, Kenya, Tanzania, Zambia and South Africa for this purpose. The remaining six interviews were conducted by telephone. In general, interviews lasted about one hour. In total, the team successfully interviewed 66 role models from 14 different countries (Table I). Those interviews form the basis for the analysis below.

3. Results

3.1 Profile of the role models selected

The role models fall into three broad categories of agricultural professionals. Roughly one-third (32 percent) work in the private sector, either on small farms, large farms or in

Category	Number	%
Private sector		
Small farmer	6	9
Large farm or agribusiness	16	23
Non-profit promotional agencies	8	12
Public sector		
Public policy, administration	13	19
Agricultural education	16	23
Research	7	10
Young professionals	3	4
Total[a]	69	100
Gender		
Male	52	79
Female	14	21
Total	66	100
Country and region of origin		
West Africa		
Burkina Faso	1	2
Ghana	8	12
Liberia	1	2
Mali	6	9
Nigeria	1	2
Senegal	3	5
Sierra Leone	3	5
East Africa		
Ethiopia	1	2
Kenya	6	9
Tanzania	4	6
Uganda	8	12
Southern Africa		
Malawi	2	3
South Africa	12	18
Zambia	10	15
Total	66	100

Note: [a]Several role models served in multiple capacities over their career, resulting in dual classifications for some
Source: MAFS role model interviews

Table I. Profile of the role models

agribusinesses (Table I). Slightly over 10 percent work in the NGO sector, in non-profit groups promoting agricultural growth. The remaining 56 percent of respondents work in the public sector, either as researchers, educators, in policy positions or in line implementing agencies (Table I).

In terms of regional representation, roughly one-third come from each of the following three sub-regions: West Africa, East Africa and Southern Africa. Men account for roughly 80 percent of nominees, and women 20 percent.

Table II describes the educational background of the role models nominated and selected. Given the large number of educators, public administrators and researchers, nearly two-thirds of the role models have earned a doctoral degree in the natural or social sciences or in veterinary medicine. Within the private sector, the small farmers rarely completed more than a secondary school-level training, while the majority of large farms and agribusinesses hold either secondary or university training up to the master's degree level.

3.2 Motivations for pursuing agricultural careers

3.2.1 Professionals with farm backgrounds. Two-thirds of the high-performing agricultural professionals interviewed for this study grew up in rural areas on farms (Table III). All of them (100 percent) cited this experience as a major impetus for

Professional category	Highest level of education completed Primary/secondary	MSc	PhD/DVM	Total
Private sector				
Small farmer	0.83	0.17	0.00	1.00
Large farm or agribusiness	0.31	0.31	0.38	1.00
Non-profit promotional agencies	0.00	0.38	0.63	1.00
Public sector				
Public policy, administration	0.00	0.20	0.80	1.00
Agricultural education	0.00	0.07	0.93	1.00
Research	0.00	0.05	0.95	1.00
Young professionals	0.00	0.33	0.67	1.00
Total	0.15	0.20	0.65	1.00

Source: MAFS role model interviews

Table II.
Educational background of the role models

	Farm background Yes (%)	No (%)	Total (%)
Role model backgrounds	66	34	100
Reasons for entering agricultural career			
Farming background, rural youth	100	0	66
Improve farm productivity and rural welfare	54	33	47
Farming is a good business	37	29	34
Interest in science	20	33	24
Inspiring teacher	5	24	11
Inspiring agricultural professional	15	10	13
Accidental	0	24	8

Source: MAFS role model interviews

Table III.
Motivations for entering agricultural careers

pursuing careers in agriculturally related professions and businesses. During our interviews, we heard many variants of the following observations:

- "I grew up in a farming environment, milking cows, working in the fields and leading oxen when ploughing the soil. I love working with the animals."
- "I am the son of a farmer. From this, I have seen the importance of agriculture from early life. My family sent me to school so I could serve."

A majority of those who grew up on farms (54 percent) expressed a strong desire to devote their careers to improving productivity in agriculture for the broad benefit of rural communities in which they grew up (Table III). They expressed these public service goals in a variety of ways:

- "I grew up in a peasant family in a small rural village. My father died when I was very young. As a result, my mother had to work very hard to feed all of us children. Ever since, my goal in life has been to find practical ways to help my mother and other small farmers who have suffered."
- "The morning I left my village to go away to school, my father told me sternly, 'Never forget these simple houses you are leaving!' "

About one-third of those with farm backgrounds (37 percent) explicitly cited lucrative business opportunities as a rationale for embarking on a career in agribusiness (Table III):

- "When my father diversified his farm from cereals into poultry (layers and broilers), he made me his poultry manager. With this exposure, I saw farming as a business, not just a way of life."

Both the quantitative data in Table III and these illustrative quotes from the role models suggest that rural youth embark on agricultural careers for very different reasons than the growing cohort of urban youth. Overall, the rural youth entering agricultural sector careers shared two common attributes. First, unlike the urban youth, they expressed a deep-seated interest, affection and respect for rural communities. Second, the rural youth discerned important opportunities for agricultural growth. In some cases, they emphasized broad opportunities for science and technological improvements to spur productivity and income gains among rural communities (54 percent). In other instances, they emphasized prospects for individual profit in high-value agribusinesses (37 percent). In virtually all cases, they expressed a sense of optimism about prospects for science-based technology and improved management to raise incomes in farming and related agribusinesses.

3.2.2 Urban youth. The remaining one-third of agricultural role models we interviewed (34 percent) had no farming background to draw on (Table III). Not surprisingly, their motivations and sources of information and inspiration often differed from the youth growing up on farms.

Unlike rural youth, over half of the urban-born agriculturalists (57 percent) reported a keen interest in applied science (33 percent) or an inspiring teacher (24 percent) as the key triggers motivating their interest in agriculture:

- "A great teacher in my high school demonstrated the extraordinary power of plants to create food and medicine biologically."
- "My 6th form biology teacher used local examples and a school garden to demonstrate basic principles and power of biological sciences."

Though less frequently than their rural counterparts, one-third of the urban-born agricultural professionals cited a motivation to improve rural welfare (Table III). A roughly equal number (29 percent) emphasized the lucrative business opportunities in agriculture. However, their sources of information and inspiration often differed from the rural youth, as the following typical responses suggest:

- "I grew up in the capital city, but my father and mother came from rural areas. I spent vacations and holidays with my grandmother in the village. I saw how much time my grandmother spent producing food. So I became fascinated with agriculture. I wondered how it might be possible to reduce work requirements for people like my grandmother."
- "During my graduate studies in Canada, I was inspired by the way of life and success of the Dutch immigrants who proved that with hard work farming was profitable."

The contrasting motivators and information sources between the two groups of youth suggest that education and training institutions can play a strong role in shaping youth interest in agriculture. Slightly over half of the urban-born agriculturalists report a keen interest in applied science or an inspiring teacher as the key triggers motivating their interest in agriculture. Clearly school curriculum and staffing played a strong role here, in many cases during secondary or even primary school. The one-third who cite an interest in improving rural welfare and reducing poverty suggest that social science curricula may likewise play an important role in raising student awareness of local economic conditions, economic trajectories and causal pathways driving productivity, poverty and national economic growth.

3.3 Factors affecting success in agriculture and agribusiness

Once motivated to pursue agricultural careers, youngsters require preparation to become productive in those pursuits. To help identify the specific skills and support that prove most effective in preparing students for successful careers in the agrifood system, we asked the role models to identify key factors shaping their own successful career trajectories. Table IV and the discussion below categorize their responses into the following categories.

3.3.1 Environmental factors affecting success. Family support. All of the agricultural professionals we interviewed cited support, motivation and values provided by family members as critical to their success (Table IV). This support took many forms: financial, moral and motivational. Many spoke of the values, the work ethic and the discipline inculcated in them from earliest youth. Stern mothers, it seems, mold strong performers in later life:

- "Mother was very strict with us kids. She worked hard and imposed a strong discipline. She paid our school fees and often went without new clothes to do so."
- "My mother, especially, was very visionary. She brewed local beer and joined her husband as a farm laborer to make money to send me to school. While sometimes my father would show signs of giving up, my mother always used to say that she did not want me to lead a life like theirs."

Factors affecting success	Responses Number	Percent	Number of mentions per respondent
Environmental factors affecting professional success			
Family support	86	20	1.4
Professional networks, role models and mentors	80	19	1.3
Other	4	1	0.1
Individual characteristics			
Work ethic			
Discipline, capacity for hard work	64	15	1.0
Like challenges	13	3	0.2
Interpersonal skills			
Strong interpersonal skills: listening, communication	41	10	0.7
Passion			
Passionate about my work	11	3	0.2
Strong desire to improve rural conditions	10	2	0.2
Deep respect for rural communities	13	3	0.2
Curiosity			
Curiosity, open mind, belief in science	23	5	0.4
Management skills			
Good manager	15	3	0.2
Respect for others			
Humility, respect for others	8	2	0.1
Strong religious values	6	1	0.1
Total	431	100	6.8

Source: MAFS role model interviews

Table IV. Factors affecting success in agricultural professions

In other cases, an adult from outside the family took an active interest that proved decisive in shaping career outcomes:

- "After my first year at middle school, in a town far from my village, the poor family that had provided my lodging and food said they could no longer afford to do so. So I reluctantly left school and returned to my home village. By chance, my former primary school headmaster passed by the middle school. He was surprised to find me gone and he asked why I was no longer enrolled. After learning the reason, he traveled to my home village to collect me. He told my mother and uncle that such a talented student must come back to school. He found lodging for me in a church and got me access to a school feeding program which provided me with one meal per day. As a result of his intervention, I went on to become the first PhD recipient ever from my village."

The key point here is that in each of these instances, someone took an interest in these children and held them accountable. This adult interest appears to have played a key role in enabling and motivating the youth to return to invest in their own villages or to make a significant broader contribution to the world of agriculture. In terms of actionable reforms, these observations suggest that formal interaction with agribusiness role models, alumni or teachers could play a key role in shaping student career trajectories in the agrifood system. Section 3.4, returns to these themes with specific suggestions from the role models.

Professional networks, role models and mentors. Agricultural professionals uniformly emphasized the importance of professional roles models, mentors and

professional networks. Many mentioned several such examples, leading to 1.3 mentions per interviewee (Table IV):

- "I had a friend whose cousin was a District Agricultural Officer with whom we used to visit farmers. This was very interesting and fascinating to me. The District Agricultural Officer was exemplary which prompted my desire to be like him."
- "My first job at the national cotton company introduced me to a very powerful network. In those years, the company had strong research and extension system with strong links to farmers. It provided excellent training for agriculture and for agribusiness."
- "Networks are critical. I have spent my career building networks."

3.3.2 Personal characteristics and skills. A majority of professionals cited three broad categories of skills that they considered key to their success: discipline, interpersonal skills and passion (Table IV). Virtually all of the role models (64 out of 66) emphasized the importance of discipline and hard work. Another 60 percent of the role models (41 out of 66) cited their ability to work well with others as key to their success. They spoke frequently of respect for others, good listening skills, the ability to work well in groups and motivate teamwork, good public speaking and writing skills (Table IV).

Over half (34 out of 66) spoke of passion for their work as a key to their success. Some expressed this directly:

- "I always had a passion for agriculture, because of what my mother was doing for us."

Others couched this passion in terms of affection, empathy and respect for farming communities:

- "I have always felt a strong affection for rural areas, a deep motivation to improve farm productivity, and a commitment to serving rural areas."
- "A deep respect for rural farming communities allows me to gain farmer's confidence and discuss realistic options for improving farm productivity."
- "My personal understanding of poverty drives my desire to work very hard to improve conditions in agriculture."

Given growing urban populations, one wonders how this empathy, passion and respect for rural communities and agricultural professions will emerge in future generations. The role model interviews suggest that improved science education can play a role in inspiring youth about frontiers of biological research and ecosystems, that improved social science curriculum can help in sensitizing students to the important role agriculture plays in economic growth, food security and economic mobility, and that explicit links between school children and successful agribusinesses professionals can likewise to open their eyes early on to the broad range of professional careers available in agribusiness and support institutions.

3.4 Role model recommendations for improving the relevance and effectiveness of AET in Africa

3.4.1 Motivating students to consider agricultural careers. Over one-third of the role models (35 percent) specifically suggested that AET institutions do more to help

change perceptions of agriculture (Table V). To do so, some suggested introducing cutting edge agricultural sciences and technologies:

- "Institutions need to present or re-package agriculture differently. Agriculture is more than digging! Schools need to explain to young professionals the diversity of agriculture and the wide array of available opportunities that agriculture and agribusiness has to offer as a career."
- "We need to motivate youth to become interested in agriculture. We need to make it cool. We should be using ICT tools. Make libraries of plant diseases available to students. Use Google diagnostics to quickly identify pests and assess problems. Demonstrate tissue culture planting material. Send real time photos of pests by cell phone to specialists for identification and recommended remedies."

Recommendation	Total responses (%)	Responses by professional category: Farming, agribusiness (%)	NGO (%)	Public sector AET (%)	Public sector other (%)
Curriculum content					
Hands-on practical work	49	41	86	32	42
Business, entrepreneurship	37	50	43	21	26
Transform image of agriculture; show successful agribusinesses	35	55	14	26	16
Value chains: marketing, processing technologies	25	14	57	21	32
Sciences and math	10	5	0	26	11
Local content	5	5	0	5	0
School farms	3	0	14	5	0
Other	38	32	29	37	37
AET systemic improvements					
Improve incentives, facilities	30	23	0	47	21
Strengthen primary and secondary agricultural education	22	23	14	26	16
Increase government financing for AET	6	5	0	5	11
Improve quality, reduce enrollments	3	0	0	11	0
Scholarships: girls, disadvantaged rural children	5	5	0	11	0
Teaching methods					
ICT	5	5	0	5	5
Other	5	5	0	5	5
Outside linkages and feedback					
Internships, attachments	25	36	43	11	11
Stakeholder feedback on curriculum	21	32	0	21	21
Business partnerships in research and education	16	14	0	16	16
Successful agribusinesses speak to students	6	9	0	11	0
Alumni	5	5	0	11	0
Field trips to successful agribusinesses	5	9	0	5	5
Agricultural extension and research	3	5	14	5	0

Note: The shaded values indicate the top priorities within each professional group
Source: MAFS role model interviews

Table V.
Recommendations for improving the relevance and effectiveness of AET in Africa

Others emphasized the importance of demonstrating the wide array of productive career opportunities in agribusiness and agricultural professions:

- "Link students with people who have made successful agribusiness careers. They need private sector role models, businessmen and women who can ignite passion and motivate students, showing that agriculture can be a profitable business."
- "Agricultural education needs to start early and involve outside motivational speakers to encourage students and to prove to them that they can do it and that agribusiness offers many promising, well-paying careers. I would happily serve in this role."

Roughly 22 percent of the role models highlighted the importance of starting young – in primary and secondary schools – to motivate and prepare youth for agricultural careers (Table V).

3.4.2 Preparing students better for productive careers in agriculture and agribusiness. Curriculum reform. Agricultural professionals offered expansive critiques of current AET curricula. Many expressed the view that current offerings are outmoded, too theoretical and fail to provide students with the practical skills required by the growing segments of the food system. Curriculum reform suggestions fell most commonly into three general categories: increased emphasis on practical training (49 percent); business management and entrepreneurship skills (37 percent) and value chain perspectives (25 percent) (Table V). The following sample quotes offer an overview of the views commonly expressed by the agricultural professionals we interviewed.

Increase practical, hands-on training:

- "Students need more hands-on training. A large number of them do not come from an agricultural background."
- "Agricultural education is too theoretical. Students need more practical training, including more internships."
- "Students should spend more time with the farmers to understand their problems. Currently, agriculture students read about tractor ploughing but they are not exposed to practical tractor ploughing."

Business and entrepreneurship:

- "Schools need to approach the subject of money. Culturally it's not polite to talk about money. Success may imply someone cheated or is a thief. Schools need to teach business subjects."
- "The curriculum we have now has been tailored to train graduates to get employed by the Ministry of Agriculture. It does not have a component of entrepreneurship. The Ministry of Agriculture is saturated. So the curriculum needs to be changed to prepare graduates to start their own companies."

Value chains:

- "Currently, agricultural schools place too much emphasis on farm production. They need to expand technical training to all parts of the value chain, particularly the off-farm segments (marketing, storage, processing, packaging, food safety, wholesaling, distribution)."

- "Link agriculture to markets and value chains: students need to see a complete picture."

Systemic improvements. Over half of the role models recommended some sort of systemic reforms, focussing on improving incentives and facilities (30 percent), strengthening agricultural education in primary and secondary schools (22 percent), and increasing funding for both schools and for student scholarships (Table V). The following quotes provide the flavor of their suggestions.

AET facilities:

- "Maintenance of universities facilities is not ok. Things which were there 30 years ago are still being used currently. Right now some institutions are selling what used to be demonstration fields. Where are students going to do experiments? This is compromising the quality of training students get from these institutions."

Strengthen primary and secondary agricultural education:

- "Agriculture should be part of primary education curriculum. Schools need to establish school farms. They need to expose kids to commercial agriculture at a young age."
- "Lower levels of education are more important than university for the practicing farmer. Focus reforms on vocational and trade schools first."
- "In secondary schools, farming and agribusiness should be engraved into the curriculum. Students should be taught that agriculture is not just farming but includes all the other agribusiness activities associated with servicing the consumers."

Faculty:

- "Lecturers need to be retrained at all levels. If we are saying our students are theoretical, it means that even the lecturers have been theoretical. So there is need for training of lecturers."

Student populations:

- "Insist on the quality of entering students. This must be right otherwise it will spoil the good intentions."
- "They should also look on intake. Why are they enrolling a lot of students when the facility cannot handle that?"

Employer linkages. A majority emphasized the critical importance linking students, faculty and curriculum to the private and public sector employers of AET students. The role models identified multiple forms in which these linkages could and should take place: internships and attachments (25 percent); employer feedback on curriculum (21 percent); business linkages with students and AET faculty research and education (16 percent).

Internships and attachments:

- "In the past, students used to be placed in companies for them to gain practical skills needed in the agricultural companies. Currently, institutions offer more theory than practical training. I propose to have curriculum that should encourage students to visit farms and industry. For example, in Germany it is mandatory for a student to have a one year practical experience on a farm or agro – company."

- "There is minimal or no interaction between students and the industry these days. This has made it quite difficult for students to appreciate and understand the agricultural industry. There is need to revive that interaction and make sure students get practical experiences before they finish their studies."

Stakeholder feedback on curriculum:

- "Schools need input from clients (general population and employers) on critical needs facing these populations."
- "Agriculture is changing and becoming modern. Therefore, there is need to review and revise the curricula regularly in order to respond to changing environments."
- "Permanent mechanism for observing what is happening in the industry should be put in place. The curriculum should be a moving document that responds to the challenges of industry."

3.4.3 Differing perspectives. While interviewees across the private agribusiness sector, NGOs, AETs and the public sector agreed that agricultural training needs to be more practical and more focussed on business management skills, differences in emphasis emerged in the reform priorities emphasized by the different categories of professionals (Table V).

Private sector agribusiness recommendations. Private sector farmers and agribusinesses emphasized two main areas for improvement in agricultural education in order to produce better equipped students for the agricultural sector: more relevant content and improved linkages with agro-industry. To improve content, they articulated the need for more practical training and greater emphasis on business management and entrepreneurship skills. To improve linkages with business and employer groups, they emphasized the importance of increased exposure to agribusiness executives, in the classroom and in the field, expansion of internship and mentoring programs, and the importance of constant two-way communication between agrifood system employers and educational institutions in order to ensure that curricula remain relevant and effective.

NGOs. NGO staff working to promote agriculture in various ways shared similar priorities as their colleagues. Like the private sector, they emphasized the importance of hands-on practical work, entrepreneurship training and internships. Like public sector professionals, NGO staff emphasized the importance of value chains. Half of the NGO professionals emphasized the importance of value chain perspectives.

Agricultural education professionals. Members of the agricultural education institutions addressed many of the same issues as the private sector. However unlike the other professionals interviewed, nearly half of the AET staff rated poor incentives and outdated AET facilities as their number one problem. They, likewise, more frequently mentioned the importance of improving math and basic science education.

Public sector. Public sector professionals, outside of the AET institutions, offered suggestions that largely mirrored those of their other agricultural sector colleagues. Like all other professional groups, they acknowledged that agricultural training should be far more practical than it currently is and that business management skills require greater emphasis. Like NGO professionals, they emphasized the importance of markets and post-farm segments of the value chain. Along with AET professionals and private sector groups, they highlighted the need for upgrading educational facilities

and incentives. Along with the private sector, this group emphasized the importance of stakeholder feedback on curriculum and student quality in ensuring ongoing pertinence and effectiveness of agricultural education.

4. Discussion

4.1 Motivating youth to consider careers in agriculture and agribusiness

This study and previous related investigations have highlighted the problem of motivating African youth to consider careers in the agrifood system. Agriculture, particularly direct on farm production, often conjures up a negative image as "dusty, dirty and poorly paid" (Dramé-Yayé *et al.*, 2011, p. 1). As a result, African youth – and urban youth in particular – remain reluctant to specialize in agriculturally related professions (World Bank, 2007; Blackie *et al.*, 2009; Kruijssen, 2009).

The role model interviews suggest several practical strategies for moderating this unfavorable image and motivating urban and rural youth to consider agribusiness careers. Since both rural and urban youth respond to demonstrated remunerative opportunities in commercial agriculture and agribusiness, school systems can play an important role in expanding the career horizons of both groups by exposing students early on to a wide array successful commercial farmers and agribusiness professionals. By highlighting the increasingly broad range of professional opportunities available, they can help to adjust youth perceptions to the changing reality of agrifood system transitions. Moreover, since urban youth respond to inspiring science education and emerging awareness of the social and economic importance of agriculture, school systems can help to motivate them by improving the relevance and quality of science and social science education, particularly in primary and secondary schools.

The importance of starting agricultural education early, in secondary and even in primary schools, emerges from this study as well as others (Temu *et al.*, 2003; Vandenbosch, 2006; Kipkoech, 2011; Mugisha and Nkwasibwe, 2014). Applied biology using primary school gardens, small ruminants and poultry, science experiments applied to local foodcrops, livestock and pests and an introduction to genetics and modern biological techniques such as tissue culture can serve to demonstrate the relevance and power of science in raising agricultural productivity.

While many role models and other studies advocate starting agricultural education reform in primary and secondary schools, implementation of these early actions confronts a common institutional problem of cross-cutting ministerial jurisdictions. Ministries of Education typically control curriculum in primary and secondary schools, while Ministries of Agriculture control content in agricultural training colleges and Ministries of Higher Education govern university education, including agricultural universities (Temu *et al.*, 2003; Eicher, 2006). As a result, reform efforts will require high-level political buy-in as well as innovative efforts to supplement overstretched human and material resources at primary and secondary school, possibly through links with agricultural extension, agribusinesses, local NGOs and community groups (Eicher, 2006; World Bank, 2007; Kruijssen, 2009).

4.2 Preparing youth for successful careers in the agrifood system

Though specific job opportunities and skill requirements differ across locations, two general prescriptions emerge consistently from the emerging body of research on agricultural education in Africa. First, agricultural education must offer skills pertinent to the needs of a gradually changing job market. Second, the training must be more practical.

4.2.1 Pertinent. Pertinence, in general, implies an increasing focus on post-farm segments of the agrifood system. Both the role model interviews and other investigations highlight the importance of gradually shifting curriculum, faculty resources and facilities to accommodate an increasing focus on downstream activities in the food system, including food processing, marketing, packaging, logistics, value chains, food safety, price risk management and storage while at the production level expanding exploration of the broad links between agricultural production, natural resource management and the environment (Temu *et al.*, 2003; World Bank, 2007; Blackie *et al.*, 2009; Dramé-Yayé *et al.*, 2011; Kipkoech, 2011; Kosura, 2011; Mugisha and Nkwasibwe, 2014). Most job market assessments likewise highlight the stagnant and often declining hiring by public sector agricultural agencies and the correspondingly increasing importance of private sector businesses in employing agricultural graduates. The growing share of private sector jobs, in turn, implies a need for increased emphasis on training in business management, finance, marketing and entrepreneurship (Makerere Institute of Social Research (MISR), 2006; World Bank, 2007; Blackie *et al.*, 2009; African Network for Agriculture, Agroforestry, and Natural Resources Education (ANAFE), 2011; Dramé-Yayé *et al.*, 2011; Kipkoech, 2011; Vandenbosch, 2006; Yambayamba *et al.*, 2012).

Over time, maintaining the relevance and pertinence of agricultural education requires ongoing dialogue with prospective employers. Hence, the regular calls for governance reform in agricultural education, for inclusion of private sector representatives on governing bodies, for regular curriculum reviews involving key employer stakeholders and for improved internships, attachments, field trips and visiting lectures by agribusiness leaders (Vandenbosch, 2006; World Bank, 2007; Blackie *et al.*, 2009; Kruijssen, 2009; ANAFE, 2011; Kamajou, 2011; Dramé-Yayé *et al.*, 2011; Yambayamba *et al.*, 2012; Mugisha and Nkwasibwe, 2014). Currently, vocational schools often feature better private sector linkages than the public sector-oriented agricultural universities. One of the keys to improved tailoring of curriculum content and monitoring of quality will involve the development of permanent mechanisms to facilitate ongoing consultation between AET institutions and prospective private and public sector employers.

4.2.2 Practical. Overwhelmingly, the role model interviews and related recent student tracer surveys and employer interviews emphasize the importance of a quality practical education (MISR, 2006; Vandenbosch, 2006; Blackie *et al.*, 2009; Kamajou, 2011; Yambayamba *et al.*, 2012; Mugisha and Nkwasibwe, 2014). Illustrating the common problem of overly theoretical training, particularly in agricultural universities, one of our role models from the poultry industry complained that agricultural students graduating in poultry science were often unable to formulate feed – a complaint he took directly to the university administrators. Similarly, the CEO of the "[…] Fresh Produce Exporters Association of Kenya – which represents some 140 members producing both fresh produce and flowers – estimated that it took a minimum of two years of additional training before graduates were up the required standard. For many positions, they preferred training staff from scratch rather than retraining university graduates" (Blackie *et al.*, 2009, p. 19).

Tools for improving practical skills include curriculum reform, improved laboratories and school production facilities, industry internships, attachments, field trips, and applied research focussing on industry-relevant problems, such as the Agshare program recently introduced at Makerere University (Kaneene and Kabasa, 2013). Staff and

facilities will also require updating. As one of our role models said, "If we are saying our students are too theoretical, it means that even the lecturers have been too theoretical. So there is need for training of lecturers."

In the face of expanding university enrollments, a clear tension arises between the quality of student internships, the quantity of students served and frequent complaints of dilution in the quality standards for admission (Temu *et al.*, 2003). Increased numbers of student interns stretch the patience of employers and compress the time available in corporate internships, which tends to lower the quality of those experiences. In response, it may prove necessary to introduce competitive, tiered selection processes to ensure that the most highly motivated, talented students earn the experience and respect of prospective employers[3].

5. Conclusions

Domestic agricultural and food markets offer one of Africa's largest opportunities for employment growth over the coming decades given growing urbanization, rapid increases in marketed food volumes and growing demand for packaged and prepared foods and high-value foods such as fresh fruits and vegetables, meat and dairy products. Despite the large number of increasingly remunerative jobs available in agriculturally related professions, the continent's youth remain broadly disinterested in pursuing careers in agriculture. Ironically, many of Africa's youth are both poorly motivated and poorly prepared to pursue productive careers in Africa's rapidly growing and rapidly modernizing agrifood system.

The African role models interviewed for this paper offer informed answers to two critical questions: How can Africa motivate its youth to consider careers in agriculture and agribusiness? How can AET institutions better prepare youth for productive careers in agribusiness?

In order to motivate youth, the role model interviews suggest that children growing up in rural areas respond to clearly perceived family needs coupled with demonstrable profitability of modern agricultural and agribusiness opportunities. In contrast, Africa's rapidly growing cohort of urban youth respond to inspiring science education, emerging awareness of the significant social and economic importance of agriculture and access to role models who can demonstrate the range of professional opportunities afforded by modern agribusiness and commercial agriculture. School systems can play an important role in motivating both groups by improving the quality and practical relevance of science education, particularly in primary and secondary schools, and by exposing students early on to a wide array successful commercial farmers and agribusiness professionals.

To prepare youth for successful agribusiness careers, the role models advise AET institutions to develop more practical curriculum, increase emphasis on business management and entrepreneurship, and substantially improve the frequency and quality of interactions with agrifood system professionals through guest lectures, internships, applied research and attachments. In order to keep AET institutions on track, the role models advocate systematic mechanisms for ensuring feedback from private and public sector agribusiness employers on AET curriculum and programs through vehicles such as private sector advisory boards, industry consultations and employer liaisons.

A currently underutilized and possibly considerable manpower resource may be available to help AET institutions in their reform efforts. Many of the role models interviewed for this paper volunteered that they would be willing to serve on mentoring

teams, advisory boards or as visitors to specific schools to help motivate African youth to consider careers in agriculture and agribusiness. If this willingness holds up more broadly among agricultural professionals, then African AET institutions enjoy a sizeable, untapped human resource in their alumni and agribusiness networks. It appears that many current professionals share the same concerns as AET leaders about the need to better motivate and equip African youth for the broad array emerging career opportunities in the continent's rapidly growing, rapidly changing agrifood system.

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Notes

1. The Capacity Development for MAFS initiative aims to help African AET institutions develop the technical skills and institutional capacity required to modernize African food systems. Details about the structure and activities of the MAFS consortium, as well as summaries of all the role model interviews, are available at: www.mafs-africa.org/african_role_models
2. See, for example, Gilboy *et al.* (2004), Jamora (2007), African Network for Agriculture, Agroforestry, and Natural Resources Education (ANAFE) (2011), Kamajou (2011), Kosura (2011), Kasolo (2013), Kireger (2013), Madoffe (2013), Mugisha and Nkwasibwe (2014), Turner *et al.* (2013) and World Bank (2010).
3. See Minde *et al.* (2015) in this volume for a more in-depth review of enrollment pressures, entrance standards, facilities and institutional responses to shifting job market needs.

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Appendix. Role model interview guide

(1) career summary:

- what motivated you to pursue a career in agriculture?
- education:
  - primary;
  - secondary; and
  - university.
- work history
- what do you consider your most important achievement?

(2) reasons for your success:
    - environment:
        - family;
        - schooling;
        - professional networks (role models, mentors); and
        - other outside factors?
    - individual characteristics
(3) recommendations on how AET institutions can more effectively prepare students for successful agribusiness careers.

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