



market, food security, poverty elevation and equity.

The 2006 Framework for African Agricultural Productivity has laid out how to achieve the CAADP vision of a significant growth rate in agriculture.

## Mind the Gap

The severity of Sub-Saharan Africa's lack of human capital is clearly illustrated by Figure 2 which shows the proportion of people enrolled in post-secondary vocational training and tertiary education. The actual size of the region indicates the number of enrolled students; Sub-Saharan Africa is almost invisible. A young person in Finland is 140 times more likely to get a tertiary education than his peer in Mozambique; a young woman in Finland is 200 times more likely to get a tertiary education than a young woman in Mozambique. The question is, with the existing tertiary institutions in Africa already overburdened, under-resourced, under-staffed and run down, how is Africa going to meet the demand for substantially higher numbers of graduates with significantly improved capabilities and entrepreneurial mindsets?

## DOES TERTIARY EDUCATION HAVE AN IMPACT ON AGRICULTURAL PRODUCTION?

According to a World Bank education report (2002): "Tertiary education exercises a direct influence on national productivity which largely determines living standards and a country's ability to compete in the globalization process". The Food and Agriculture Organization (FAO) states that no country has become developed without well-educated people and a strong agricultural base that provides food security (*Education in Agriculture: Links with Development in Africa*, SDdimensions, FAO, July 1996). The FAO acknowledges that good educational systems will not solve all problems, but they are a prerequisite for sustained agricultural production and economic development. On the evidence side, a study *Revisiting the Role*

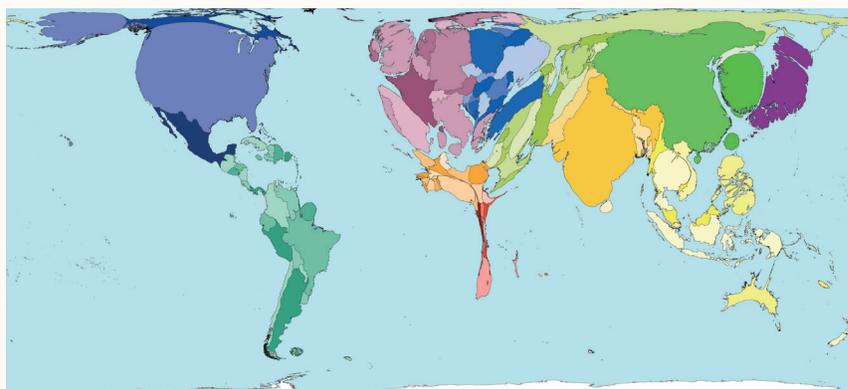
*of Education for Agricultural Productivity* found that education had a significant positive impact on agricultural productivity worldwide. The effect can be considered sizeable—an additional year of schooling for the whole population could raise land productivity by approximately 3.2 percent (*Am. J. Agr. Econ.* (2013) 95 (1): 131-152). Rwanda, for example, has invested aggressively in tertiary education in recent years; the number of new graduates since 2006 is twice the number of graduates in the previous 44 years since independence. Now consider Rwanda's national food production for the same period; Figure 3 shows a significant boost in food production coinciding with the massive upgrading of human capital. How well they are correlated has not yet been studied in detail.

## AFRICAN UNIVERSITIES DO NOT EDUCATE FOR AFRICAN NEEDS

Why is it difficult to find competent doctors, engineers and managerial candidates for agribusiness in Africa? Table 1 shows young people's subject preferences in Sub-Saharan Africa. It is striking how much their preferences mirror those of students from the Organisation for Economic Co-operation and Development (OECD) countries, despite the huge difference in economies and societies. There is huge labor demand from extractive industries and health care in Africa and yet crucial subjects such as engineering and health have fewer students in Africa than in OECD countries.

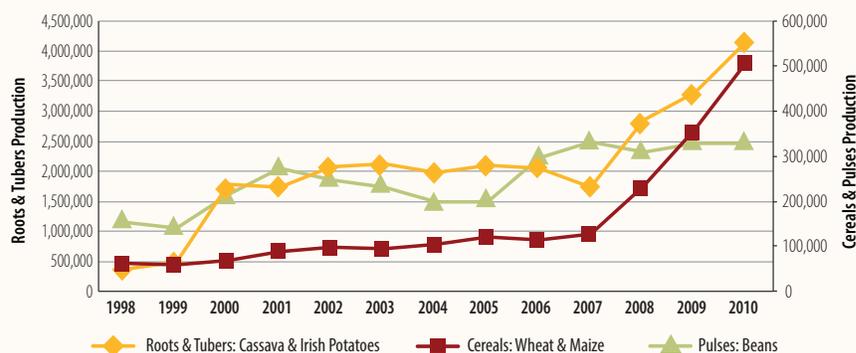
Most striking is that only 2 percent of African students specialize in

**Figure 2. Territory size shows the proportion of people worldwide enrolled in tertiary education**



Source: <http://www.worldmapper.org>, Map no. 203

**Figure 3. Evolution of Rwanda food production**



Source: MINAGRI annual report 2010/11

**Table 1. What do students study? University graduation rates in Africa and the world (2008-2010)**

	Education, Humanities and Arts	Social Science, Business and Law	Science	Engineering, Manufacturing and Construction	Agriculture	Health and Welfare	Services	Other
<b>Sub-Saharan Africa</b>	26%	44%	12% (3% ICT)	4%	2%	5%	0%	7%
<b>North Africa</b>	22%	51%	8% (1% ICT)	10%	1%	6%	1%	1%
<b>Asia</b>	23%	30%	6%	20%	4%	9%	4%	4%
<b>Latin America</b>	23%	38%	7%	9%	2%	13%	3%	5%
<b>OECD</b>	25%	37%	10% (3% ICT)	11%	2%	11%	4%	1%

Source: *African Economic Outlook 2012*, UNECA

agriculture, even though agriculture contributes 32 percent of Africa’s GDP, compared to 1.4 percent in Europe. Africa has a comparative advantage for business development within agriculture and a great underutilized potential for regional and international trade in processed agricultural products. So why are only 11 percent of African students studying subjects with potentially high employability, while 70 percent are studying subjects which have already produced huge cohorts of unemployed graduates? One reason might be that it is far cheaper to offer humanities and social sciences degrees, as these do not require laboratory/workshop equipment. So when governments and university management have to respond to public pressure for more university seats, they seem to opt for the cheapest supply solution, although this choice does not address labor market/private sector demand. More autonomy for universities and private sector representatives on university councils may help effect change. On the demand side, bright young people do not often choose to study agriculture. For most young Africans, agriculture is synonymous with poverty. This problem has been faced by other developing regions as well, so African universities could learn to tackle it from their peers elsewhere.

### **GRADUATES SUITED TO A WORLD THAT NO LONGER EXISTS**

The educational system inherited from Africa’s former colonial powers has not changed significantly since independence. The structure of the continent’s food and agricultural systems is rapidly becoming private sector driven and yet most universities develop graduates suited to teach or work in public sector universities, research institutions and ministries of agriculture. Not only is this sector saturated but the technical knowledge of these graduates is outdated. Human capital in agriculture covers a diverse group of professionals such as extension agents, agronomists, veterinarians, plant breeders, food scientists, nutritionists, applied engineers, agribusiness specialists, entrepreneurs in agricultural supply chains, natural resource managers, regulatory authorities and policy analysts. There is a major mismatch between what job seekers have to offer and what employers require. This is a critical problem for many reasons—for the individual who is unable to find employment, for society that gets little return on its investment in higher education, for the industry that is unable to utilize its growth potential due to lack of adequate human capital and for the entire agricultural sector which is already struggling to attract qualified young people.

### **New Challenges Require New Mindsets and Skills**

A 2002 report entitled *Constructing Knowledge Societies: New Challenges for Tertiary Education*, stated: “Higher education produces the entrepreneurs, the creative thinkers, the business leaders that generate economic growth and turn poor countries into prosperous ones.” Africa’s challenge today is moving agriculture education from its present emphasis on passive ‘storage of knowledge’ that produces ‘knowledge conveyors’ to a more proactive focus on ‘knowledge adaptation’ that produces ‘knowledge creators’ (Figure 4) with the skills and capabilities urgently needed to unleash the potential of the agriculture sector. Africa needs creative entrepreneurial professionals and leaders within agriculture to achieve the CAADP vision of a 6 percent annual growth rate in agricultural productivity.

### **DISENTANGLING THE GORDIAN KNOT**

It is time for radical new approaches and a commitment to use whatever means available to increase human capital in African agriculture. Reinvesting in tertiary agriculture education (TAE) is a must as this sector feeds the rest of the knowledge chain with knowledge brokers, trainers and teachers (thereby stimulating

**Figure 4. Vision for change of learning paradigm within TAE**

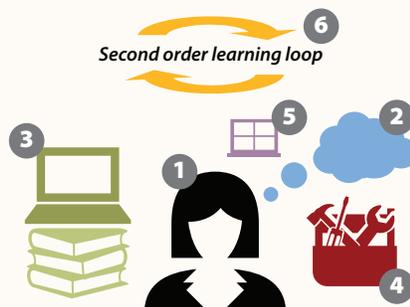
Today's approach to TAE in Africa  
mainly produces passive

### Knowledge Containers



New approach to TAE in Africa  
designed to produce active

### Knowledge Creators



At present the students are passive receivers of knowledge with little ability to use it once graduated. Future graduates will have less theoretical knowledge (1) and instead be capacitated to see and analyse reality (2), reflect if they have adequate knowledge (1) or need to add more (3), in interacting with the world graduates will through experiential learning be equipped with a toolbox of skills and methods (4), which they apply on reality (2) and reflect on the result. They will learn to reflect (6) on their own biases in interacting with reality here reflected as the "window" (5) they see the world through (inspired by Kolb, D 1984 *Experiential Learning: Experience as the source of learning and development*).

the way they are governed. A culture of knowledge sharing should be fostered between research, extension and higher education. Information needs to flow in both directions along the knowledge chain, from producers to professors and from peasants to policy makers. The private sector must be engaged in setting priorities, teaching and getting students out of the classrooms so they can tackle real life problems and accelerate skills acquisition through experiential learning. Ethical aspects should be reinvigorated in educational programs to address corruption, mismanagement of public and natural resources and abuse of authority.

These changes cannot be brought about by any single set of stakeholders working in isolation. Farmers and their organizations, the private sector, higher education institutions, community based organizations, non-government organizations, governments, development partners and individuals all bring different competitive advantages to the table, and should therefore all be engaged. Some of these stakeholders can experiment and innovate at low cost, while some validate and extrapolate, and others scale up and institutionalize.

further capacity development in Africa). Increased public investment in agriculture through CAADP benefits higher education, but an increase in direct foreign investment and overseas development aid will also be required to upgrade facilities and update curriculum. Africa can learn from successful educational models worldwide that are graduating creative thinkers and entrepreneurs in

agriculture, such as Earth University in Costa Rica which graduates capable entrepreneurs; or Arizona State University which has prioritized student rather than faculty demands. New technologies like the Massive Open Online Courses (MOOC) should be viewed as a complement to formal education. Governments should grant tertiary institutions much more autonomy and encourage changes in

## MORE ON THE TOPIC

- Association of African Universities (AAU) homepage: <http://www.aau.org>
- Agricultural Education and Training in Africa (AET) homepage: <http://www.aet-africa.org/>
- African Network for Agriculture, Agroforestry and Natural Resources Education (ANAFA) homepage: <http://www.anafeafrica.org/>
- Comprehensive African Agriculture Development Programme (CAADP) homepage: <http://www.nepad-caadp.net/>
- Earth University homepage: <http://www.earth.ac.cr/?lang=en>
- Forum for Agricultural Research in Africa (FARA)'s agribusiness incubators homepage: <http://www.fara-africa.org/our-projects/unibrain/>
- IFPRI (2207) Strengthening Agricultural Education and Training in Sub-Saharan Africa from an Innovation Systems Perspective; Discussion Paper 00736 <http://www.ifpri.org/sites/default/files/publications/ifpridp00736.pdf>
- Juma C (2012) Agriculture Education Key to African Development, Research from Harvard Kennedy School, volume 5, Issue 1. <http://www.hks.harvard.edu/news-events/publications/impact-newsletter/archives/autumn-2012/agricultural-education-key-to-african-development>
- World Bank (2002) entitled Constructing Knowledge Societies: New Challenges for Tertiary Education [http://siteresources.worldbank.org/INTAFREGTOPEIA/Resources/Constructing\\_Knowledge\\_Societies.pdf](http://siteresources.worldbank.org/INTAFREGTOPEIA/Resources/Constructing_Knowledge_Societies.pdf)

