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Towards 2050: Trends and Scenarios for African Agribusiness

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Abstract

Agriculture, including agribusiness, is projected to be a \$1 trillion USD industry in sub-Saharan Africa by 2030 (World Bank 2013). It is therefore understandable that agricultural development in Africa is back on the global development and investment agenda. In September 2009, the G20 recognized agricultural development as a central activity for African development, echoing the calls of the World Development Report (World Bank 2007) the “Our Common Interest” Report (Commission for Africa 2005) and most recently the African Heads of State at World Economic Forum in Cape Town called for increased agricultural investment (NEPAD 2013). All emphasized the notion that agriculture is a key driver of economic development and growth, poverty alleviation and food security on the African continent.

Keywords: agricultural development drivers; new agribusiness systems; governance and systems innovation; scenarios for growth with equity

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Introduction

Agribusiness, is projected to be a \$1 trillion USD industry in sub-Saharan Africa by 2030 (World Bank 2013). It is therefore understandable that agricultural development in Africa is back on the global development and investment agenda. With investments from sources around the globe, agribusiness started booming in the 2000s. In addition, soaring grain prices and global food inflation spurred investor interest in African farming. Africa has the land availability and space for farm production to grow significantly, which counts in its favor. Many farming projects, linked to the value chain through agri-food processing, food retail establishments and service networks, increasingly do business on the continent, due in part to growing private sector interest. African agriculture attracted more than \$100 million in private equity investment in the first half of 2012, compared with \$50 million for the whole of 2011. Standard Chartered invested \$74 million early in 2013 to gain a stake in the grain and fertilizer trade in sub-Saharan Africa, and another \$20 million in Zimbabwe's horticulture sector.

This trend is also recognized and welcomed in the world of government and economic politics. In September 2009, the G20 recognized agricultural development as a central activity for African development, echoing the calls of the World Development Report (World Bank 2007, the "Our Common Interest" Report (Commission for Africa 2005) and most recently the African Heads of State at World Economic Forum in Cape Town called for increased agricultural investment (NEPAD 2013). All emphasized the notion that agriculture is a key driver of economic development and growth, poverty alleviation and food security on the African continent.

The strategic and societal importance of African agricultural performance is also clearly illustrated by its direct and indirect relationship to and impacts on all eight United Nations Millennium Development Goals (MDGs) (United Nations 2009). At the 2013 World Economic Forum in Cape Town, South Africa, the African Union chairperson confirmed this view and stated "Africa is on the road of prosperity. African agriculture is the true driver of economic growth; but we need the private sector to kick-start this process" (NEPAD 2013). This importance was also confirmed by the World Bank (2013) report, "*Growing Africa – Unlocking the potential of Agribusiness*", which recognized that agribusiness, in particular, is positioned as a vital sector to overcome constraints and to encourage strategic "good practice" investments in African agriculture.

Looking toward the future development of African agriculture, a few questions need to be considered: what functions and actions should be prioritized for agriculture and who should drive or initiate them; what good practice models and good governance protocols will be required to strategically direct development paths towards sustainable and equitable growth; what will be needed to enable African agriculture to contribute its full potential over the next decades without again turning into an exploitative scramble for Africa (Pakenham 1992); how should initiatives be structured, directed and implemented; and what scenarios could emerge for African agriculture depending on the future directions taken?

Keeping these issues and questions in mind, this paper sets out to:

- Identify drivers and trends that will shape agriculture's roles in Africa. These include: meeting the growing demand for food at global, regional, city and household levels, activating Africa's immense untapped agricultural production potential and possible production and price scenarios, directing the evolving agri-food business systems and investments in African agriculture, strengthening economic management and good governance practices, and creating human capital development;

- Consider a strategic framework – comprising of functions, thrusts and actions; and to
- Apply this framework in context of different scenarios for African agricultural development and growth.

Drivers of Development and Change in African Agriculture

African agriculture has a unique set of circumstances and features that differentiate it from other regions. For example, the Asian Green Revolution in the 1960s and 1970s had an immediate and highly positive impact in terms of economic development and growth, economic structure, governance, human capital development and the political development paths followed. Yet, any effort to repeat these results in Africa must recognize differences between the two regions and but also factor in lessons learned, because the Green Revolution also had negative consequences. The negative aspects were mostly related to imbalances between output prices, low yields and high input costs – in other words, what is known as the price-cost squeeze. Due to global trade mechanisms, the visibility of social impacts, including social media, and the internal dynamics on the continent, Africa faces a future expected to be significantly different from its past.

What are the expected occurrences that will drive opportunity and challenges in African agriculture over the next decades?

The emerging consensus among development institutions and agencies and strategic investors, referred to in the introductory paragraphs, must be appreciated as a primary set of forces driving the restructuring of agricultural development in Africa. The universally accepted Millennium Declaration, which emphasizes agriculture's prominent role in all eight of the MDGs, together with the declarations by African leaders on the future role of agriculture, clearly situate African agriculture's roles and contributions within the broader economic-political context of both global and local realities impacting on Africa. However, this still falls short of wide-scale implementation and continues to show underinvestment and mis-investment by many governments and international donors (De Janvry 2009).

Recent statements and financial commitments by influential groups are encouraging. Among those expressing support of African agriculture are the World Bank and the 2008 World Development Report, the Food and Agriculture Organization of the United Nations (FAO), and several high profile international donor foundations – notably the Bill & Melinda Gates Foundation, Rockefeller Foundation, Ford Foundation and Kellogg Foundation. The launch of programs such as the Comprehensive African Agriculture Development Programme (CAADP) of New Partnerships for Africa's Development (NEPAD), and the Alliance for a Green Revolution in Africa (AGRA) must also be noted. These have paved the way for new funding and investment instruments in African agriculture, globally. There also have been commitments by, inter alia, local African business entities, such as the Sanlam/Kellogg AgriVie Fund, the FutureGrowth Fund from Old Mutual, funding from Standard Bank to support AGRA, and investments by Standard Charters and Zeder—to mention just a few cases, to invest in new agricultural related ventures in many African countries.

Driver 1: Global Market Growth for Food and Fiber

By 2050, the major growth in demand for food and products is expected to come from the markets of North America, Western Europe and China, and these trends will drive commercial food business systems (Swinnen 2007; McCoullough et al. 2008; ABSA 2009). Demand will be influenced by population growth, per capita income trends, lifestyle aspirations and related consumer preferences. Consumer demand in these regions has

become and will continue to be more exacting, fragmented and geared to convenience, food safety and quality. While these consumers will also seek attributes of fun, surprise and taste sensations in their food experiences they will also be sensitive to environmental, ethical and social considerations (Hughes 2007; Vermeulen et al. 2008). These trends are expected to have profound effects on the sourcing of food products, and will link farm production, processing, wholesaling and retailing. This means the agri-food value chain will increasingly be subjected to consumer preferences, considerations and values originating in these markets, and the related food safety, environmental and ethical valuations, certifications requirements, traceability and monitoring systems. Civil society and activist groups, and social media can be expected to monitor such developments.

In addition, exploding urbanization in Africa, combined with its expected increases in per capita food consumption (FAO 2009; Vink 2010), will directly expand local demand and provide opportunities for localized (short) value chains, directly linking farming areas to growing urban concentrates on the continent.

The evolving trade pattern confirms these trends. Both exports and imports are increasing, with imports particularly focused on high value food products. African agriculture is increasingly linked to global food trade patterns and will continue to be integrated in this world of contracts, value chain specifications and business opportunities.

Household food security in urban and rural environments. Food security is defined in terms of food supply, access, distribution and nutrition (DBSA 2009). This means that having a positive food self-sufficiency index (SSI) – the ability to produce sufficient food for the nation or region – does not necessarily lead to food security at the household level. Many African countries with positive SSIs still deal with serious hunger, food vulnerability and malnutrition (Global Food Security Index, Economic Intelligence Unit 2012). South Africa is a case in point (Vink and van Rooyen 2009; De Kock et al. 2013).

Food supply can generally be secured through a combination of trade and local farm-level food production. It should not be approached from only a national agricultural production perspective. A broader, holistic view is needed—one that focuses on farm production at national and household levels, on trade and distribution, and on aspects of food safety, household-level access, vulnerability and nutrition education (DBSA 2009; De Kock et al. 2013).

Food security at household level is generally attained through income security or the ability to purchase food stuffs as required. However, in poor environments, food security is vulnerable and highly sensitive to household income levels and food price fluctuations. Thus, food security in poor societies should focus on strategies to enhance household income generation and on creating resilient food production capacities in both rural and urban environments through, for example, the support of food gardens. In the quest to eliminate food vulnerability, there must be support for the view of the International Assessment of Agricultural Science and Technology for Development (IAASTD) which states that “achieving food security and sustainable livelihoods for people in chronic poverty depends on ensuring access to and control of resources by small-scale farmers” (IAASTD 2008). In line with the IAASTD, and with international development institutions such as the Bill & Melinda Gates Foundation, the Kellogg Foundation, Oxfam and FAO, emphasis must thus be placed on support to assist existing smallholder farming.

Driver 2: Africa's Untapped Agricultural Potential

Global food production may need to increase by 70 percent (above 2005 to 2007 levels) by 2050, in order to feed the world's growing population. Cereal production will have to expand by 43 percent and meat production by 74 percent. While Africa and South America have an abundance of untapped agricultural resources to deal with this challenge, other continents will find it increasingly complicated to expand their use of agricultural production resources (see Table 1).

Table 1. Utilization of Arable Land Resources (1980-2050). (% of available potential)

Region	1980-2004 (percentage)	To 2050 (percentage)
World	21	15
South America	16	40
Asia	46	12
Central & North America	-2	2
Europe	114	-2
Africa	18	60

Source. FAO and Standard Bank

Table 2 illustrates the current status of global land potential for food grain production. This clearly shows that Africa, the region with the most abundant land resources, provides by far the greatest scope to supply food and fibre through land-expanding activities to meet the growing global demand.

Table 2. Food grain production growth potential: Actual 1980-2004 and projected 2005-2050.

	1980-2004 (percentage change)	2050 (percentage change)
South America	80	60
Asia	64	47
Central & North America	40	21
Europe	80	44
Africa	75	150

Source. FAO 2009; ABSA/Barclays Bank 2009; author's own calculations 2009.

Sources of agricultural production growth. While agricultural production in Africa is often viewed as stagnant, the production increase recorded by African agriculture since 1984 tells another, very encouraging, story. Per capita production increased from below 200 kg in 1984 to almost 600 kg in 2006 and from 300 million tons in total in 1984 to almost 750 million tons in 2006. These increases were largely achieved through a combination of factors illustrated in Table 3, including expanding arable land, increased yields and higher cropping intensity. The scope to expand agricultural production through these three main sources of growth means that exceptional opportunities exist for African agriculture.

Table 3. Sources of growth (percentage) in African agriculture: Recorded for 1961–1999 and projected for 2000–2030.

	Arable land expansion		Increasing yields through technology and production management		Cropping intensity increases through multiple cropping, etc.	
	1961-1999	2000-2030	1961-1999	2000-2030	1961-1999	2000-2030
Developing countries	23	21	71	67	6	12
Sub-Saharan Africa	35	27	34	61	31	12
Near East and North Africa	14	13	72	68	14	19
East Asia	26	5	79	81	-5	14
South Asia	6	6	80	81	14	13
Latin America	46	33	55	46	-1	21

Source. FAO 2009; ABSA/Barclays Bank 2009; and author own calculations 2009.

Climate change, variation and instability, such as variable rainfall during peak production periods, constrains farm production and must be addressed through research and development (R&D) and insurance support schemes to sustain food security and reduce food vulnerability in the region.

Climate change is expected to cause shifts in production space and locations over time. However, no major changes in the potential for food grain production are projected for the sub-Saharan region over the next 20 years (BFAP 2009). The potential impact of climate change requires careful assessment, especially its spatial effects on populations and smallholder households.

Driver 3: Transformation in the Agri-food Business System and the Emergence of Value Chain Networks

The driving forces of income growth, demographic shifts, globalization and technical change have led to a reorganization of the agri-food system since the 1990s, with supply chains and support networks becoming dominant features linking farm to plate. The agri-food industry has fundamentally restructured to meet the ever expanding global demand for food and, keep up with changing consumer preferences and technological innovation, and also to comply with the worldwide deregulation of agricultural business and trade (Zuurbier 1999; Vorley et al. 2007; Hughes 2007; Swinnen 2007; McCoullough et al. 2008; Reardon et al. 2009; Webber and Labaste 2009; Swinnen 2010). These changes have introduced shifts from:

- Spot-market-based transactions, which are largely opportunistic in nature, towards value chain management and coordination, which are largely governed by trust, long-term contracts and relationship management,
- Local sourcing of farm products towards global sourcing in wider regional and international markets,
- Public- or government-based standardization and certification processes (food and quality assurance, fair labor practice, etc.) towards private sector-driven norms and standards in food safety and ethically and environmentally based consideration (supermarket initiated certifications and audits).

Interest in agriculture is now clearly stretching beyond farm land and focusing on all aspects of the value chain. As a result, sourcing of produce from farmers is increasingly directed through contracts or long-term arrangements, and subjected to certification and monitoring procedures to conform to standards required by

markets. Farm producers have effectively become members of corporate food business networks, operating in an integrated and coordinated manner with input suppliers, service providers, funding agencies, processors, retailers and supermarkets – agri-food value chain networks (Jaffee 1993, 1995; Reardon, Timmer and Berdegue 2004). Trust and relationship management within a particular agri-food chain network have become important drivers of sustainable agribusiness. The World Bank (2013) pointed to the importance of promoting initiatives that include small, medium and large companies in the value chains, creating new opportunities and jointly diagnosing and relieving bottle necks and constraints. The aforementioned all promote a range of commercially directed farming models and governance systems, directed to enhance the business performance of a particular value chain network vis-à-vis other competitive agri-food chain networks.

The location of future production sites. Because of the vast potential of their unused natural resources and land availability, Africa and to a lesser extent Latin America, will become important future locations for farm production and sourcing of raw materials to satisfy the rapidly growing demand for food and .

With a so-called green revolution, Africa could increase the value of its agricultural output from \$280 billion a year in 2011 to more than \$500 billion by 2020 and \$880 billion by 2030. Growth of this magnitude would increase demand for a whole range of upstream products and services such as fertilizers, seed, pesticides, machinery, market advice and food safety services, and downstream activities such as grain storage and refining, food processing and biofuels. This demand for upstream and downstream activities is projected to reach \$275 billion a year by 2030 (McKinsey 2011).

Meeting this growth in demand will require the emergence of global agri-food chains and networks that can source raw materials from African producers. In this case, cost effectiveness, innovation, traceability, food safety and quality checks will drive the different processes in the chain. Localized agri-food chains that link farm production to rapidly growing urban areas in Africa will also feature in the food business system of the future. The evolving agri-food business system and agri-food value chains will impact directly and dramatically on African agricultural and farming prospects and typologies (Shepherd 2008; Webber and Labaste 2009; Reardon et al. 2009; Poulton and Lyne 2009).

Changing investment patterns. The restructuring of the agri-food business system is also expected to change the nature of agribusiness investments. For example, in order to consolidate value chain actions and allow for scale economics, investments will need to focus on wholesale market infrastructure. The singular purpose of providing farm producers with access to the next level in the value chain will thus shift the emphasis to the development of infrastructure and support systems to facilitate the functioning of all levels of operation in the total agri-value chain. The new drivers of business opportunities in the food system will be investments that focus on agribusiness mentoring, coaching and extension for producers participating in the value chain, and on processing, retail functions, and their mechanisms for support and food safety (Swinnen 2010; Reardon et al. 2009; McKinsey 2011; World Bank 2013).

A 2010 Organization for Economic Cooperation and Development (OECD) report on “Private financial sector investment in farmland and agricultural infrastructure” highlights the expectation that investment in agriculture worldwide will grow, “double, even triple in the medium to long-term” (the estimated investment by the private sector in 2013 amounts to US\$10–25 billion). The geographic focus of such investment activity is shifting noticeably toward South America (led by Brazil) and Africa – both areas with land resource abundance.

One major advantage for Africa is the lower land acquisition cost for large-scale farming operations in southern and central Africa, boosting scale economies advantages. In Brazil, land costs range from \$1500 to 3000 per hectare, compared with \$300 to 500 per hectare in Africa. There are also transportation cost advantages on the east coast of Africa relative to the Western Hemisphere as far as exports to India and the rest of Asia are concerned (OECD 2010). This will see the emergence of global agri-food chains and networks that will source raw materials from African producers, with cost effectiveness and innovation, traceability, food safety and quality checks, all driving the different processes in the chain. Localized agri-food chains that link farm production to rapidly growing urban areas in Africa will also feature in the food business system. The evolving agri-food business system and agri-food value chains will impact directly and dramatically on African farming prospects and typologies (Shepherd 2008; Webber and Labaste 2009; Reardon et al. 2009; Poulton and Lyne 2009).

The emerging investment patterns in Africa are complex. Local capital markets are still in the early stages of development, and land tenure regulations that govern land titles and concessions are evolving. Investment schemes typically constitute a tiered corporate holding structure with subsidiaries overseeing farm production processes, often across different countries. These large-scale farmland developments do offer benefits, such as sustained and higher wage earning opportunities, better and more stable working conditions and employment benefits, local capacity and skills development, improved agronomic and business practices for neighboring farmers, as well as increased farm productivity and access to markets. Where outright ownership of land is not possible, long-term concessions are generally negotiated with governments, which often include commitments by investors to provide support for social projects such as schooling, health, and feeding and skills development. These operations also are often the biggest and most compliant tax contributors, expanding the tax base for local communities. Governments have thus been generally favorably disposed to such private capital development, transforming of farmland and investing in agricultural and related rural infrastructure (OECD 2010).

The 20 percent plus investment paradigm constitutes an increasingly attractive option for African agriculture, governments and local entities. However, the social sustainability of such production systems is an important political and financial concern and will be discussed in the sections to follow.

As to the environmental sustainability of such farmland development, the 2010 OECD report indicates that many investors in large scale agriculture cultivate close working relationships with multilateral organizations such as the World Bank, the International Finance Corporation (IFC) and the FAO, to ensure sustainable farming practices.

Another feature of the changing investment pattern in African agriculture focuses on the improvement of logistic infrastructure. The World Bank 2012 Logistics Performance Index (LPI) rates most African countries low, putting eight of the ten lowest LPI countries in the world in Africa. In many respects, the key to unlocking Africa's agricultural potential will be driven by investment in logistical infrastructure.

Smallholder agriculture and agri-food business transformation. Farm producers who are directly linked to agri-food value chains are generally better off due to price and quality considerations, and because they have assured markets and can aspire to long-term prospects to share in value-adding opportunities and more secure financial support services (Zuurbier 1999; Vorley et al. 2007; Swinnen 2007; Shepherd 2008; Webber and Labaste 2009).

Food companies and supermarkets generally prefer to source from large-scale farm operations, rather than from large numbers of smallholders, in order to avoid high transaction costs and problems with consistent volumes, quality and delivery. Larger farms are also better equipped to benefit from this emerging value chain-driven food business system (Kirsten et al. 2009).

Does a commercial value chain-dominated agri-food system work against smallholder agriculture or can smallholders access such business systems? The underlying hypothesis to this question is that the transforming agri-food business system will effectively exclude smallholder agriculture from future business opportunities. In general, it must be noted that various studies on the position of smallholder agriculture in agri-food value chain-driven business systems do not necessarily support this view (Swinnen 2007; Shepherd 2008; Webber and Labaste 2009; Kirsten et al. 2009; Reardon et al. 2009). Various cases can be quoted where raw products are sourced from smallholders – not as an act of charity or corporate social responsibility, but because their inclusion was found to be profitable, even when large producers operated in the same sector. Sugar, vegetables, milk, fruit and meat are examples of produce sourced in this way (Nestle 2009; Shoprite/Checkers 2009, Fresh Mark 2013, to name a few).

These studies also found that where smallholders dominate the agrarian structure, as in many African regions, food companies tend to source from those smallholders operating in localities where certain elements are in place and functioning effectively. These include production infrastructure and assets, such as irrigation systems, farm equipment and farm equity, collective action organizations such as farmers' associations and producer cooperatives, as well as access to transport and communication systems. Partnerships with government agencies are also sought to enable such situations. Supporting government policies and systems are generally found to enhance the successful inclusion of smallholders in the value chain. Resource and input supply contracts between smallholders and operators serving a particular agri-value chain are important in dealing with constraints faced by smallholders, such as the lack of credit, production inputs, technology transfer and extension.

Value chains depend on sound partnership arrangements. Partnership business models such as outgrower schemes, contract farming, cooperatives or business trusts, and coaching and extension schemes, accommodate the aforementioned features, and will enable smallholders to participate in future business prospects and to move on a development trajectory towards higher levels of commercial farming (Karaan 2009; Van Rooyen 2009, Mabaya, et al. 2011).

Linking smallholders (and other small- and medium-scale businesses) to commercial business systems, should thus be considered a continued major future focus in situations dominated by the presence of, or with imperatives to develop, smallholder agriculture. Policy directives, government support to business-focused strategies, program interventions and projects, strategic financial support instruments, public-private sector partnerships and appropriate governance systems (including long-term transactions and contracts), should be designed and introduced to support African smallholder participation in the evolving agri-food system.

Driver 4: Scale Factors in Farm Production

Most African agricultural production is still done by smallholders, however, production within this system is largely stagnant and its commercialization – linking farm producers to commercial markets is generally complex and difficult (Agra 2009; Kirsten et al. 2009).

Larger scale farming in countries such as South Africa, Zimbabwe, Zambia, and Tanzania has proven to be successful. So have recent large or mega scale corporate farm development initiatives that range from 30,000 ha to 1 million ha in the grain, livestock, sugar and fruit industries in sub-Saharan Africa (Standard Bank 2009; AgriVie 2009; Byerlee 2010; Emergent Asset Management, Citadel Capital and Dominion Farms, cases quoted by the OECD 2010; Ducastel 2010; Connolly et al. 2012). In particular, these large-scale ventures have provided the required investment returns, as well as technical innovation, yield-increasing practices, market responses, and social community support. These business-driven systems have contributed significantly to the production increases noted in African agriculture (see previous sections). They produce large volumes cost effectively for growing markets and consistently provide food grains, vegetables and fruit for local consumption and for export.

What is underlying this trend towards large-scale farming in Africa? Apart from a range of scale economic advantages in the farm production process – mechanization, labor management, and so forth – large scale farming generally lowers the transaction costs of delivering to agri-food value chains, while also providing consistency in production volumes and quality. Therefore, input-provisions and food-processing companies generally prefer to source from large-scale farmers over smallholder. Large-scale farming also competes more effectively with non-agricultural business activities for investment, financial reward and remuneration for its managers and workers (Reardon et al. 2009; Kirsten et al. 2009).

Land Transfers and the Notion of “a Land Rush” in Africa

From the above discussion it is clear that Africa has again become subject to outside interest in its natural resources; this time especially land and water. Dramatic changes are occurring throughout Africa including South Sudan, Ethiopia, Madagascar, Tanzania, Congo, Kenya, Liberia, Senegal, Zambia and Mozambique, to name some with leading investors from Asia, particular China, India and Korea and also from South Africa, the Netherlands, France, Canada, Italy, UK, Sweden and also international funds (FAO 2009; The Land Matrix 2013). Recent research by Anseeuw and Ducastel (2011) identified deals made for 948 projects encompassing 161.6 million hectares in Africa, compared with 240 projects encompassing 17.6 million hectares in Latin America. Main investors in the African deals originated from China (77 deals), Saudi Arabia (65 deals), UK (60 deals), India (60 deals), South Africa (41 deals), USA (38 deals) and the Netherlands (26 deals). Table 4 presents examples of recent land related farm developments in Africa.

Africa's abundance of high potential lands and water (see endnote 2) allows the production of valuable agri-food commodities. This, combined with eager local African governments, has seen the number of land deals soar and an unparalleled transfer of land ownership. While some sceptics have viewed this as a form of land grab or new colonialism, others emphasize that this has potential to increase food security, employment and income generation. While agreeing that these cash-for-cropland deals might improve growth prospects and food security for all participants, many NGOs, such as Oxfam and World Watch, have raised concerns regarding the real intentions behind such deals and the potential impact of removing indigenous people from their lands, with no alternative jobs or resources provided. Some also question the shift in focus towards large-scale agribusiness and value chain-led investments (FAO 2009; Oakland Institute 2011). The World Bank counters that supporting governments in regularizing land tenure systems provides a much improved base to encourage investments which will support those whose rights have not been formalized. Smallholders need not be excluded in such developments, inter alia, through good practice investments and protocols (World Bank 2013).

In their study on such so-called land grabs in Africa, Connolly et al. (2012) concluded: “[e]ither way, when large scale farming operations first come to a region, social disruption is inevitable, or outcomes are difficult to predict. Availability and pricing of both labor and resultant agricultural products are certain to change. Opportunities for entrepreneurs, either as part of a supply chain, or in ancillary goods and services are also likely. The response of the community may also come into play, whether through cooperation or resistance.” From this, it can be concluded that any new paradigm and strategic framework will have to focus in particular on sustainability, as defined from various social and livelihood perspectives. A clear view on the future position of smallholder farming will therefore also be relevant.

The future of smallholder farming. Do these economic advantages and business preferences for large-scale farming and the related land transfers effectively leave African smallholder farming out in the cold, so to speak?

First, there is growing evidence that smallholder systems can increase farm production through yield-increasing technologies and improved access to agricultural support services – if the technologies and services are supplied to smallholders and if they are linked in to agri-value chains (Future Agricultures 2011; World Bank 2013).

Second, the “poor but efficient” hypothesis (Schultz 1984) also provides evidence that although smallholder farmers could operate at higher economic efficiency levels than large-scale agriculture, they generally remain poor because of the low income-producing potential of small scale. Technological innovation may enable smallholders to increase their income levels, although this generally also requires increased capital investment, risk insurance and management applications, and technical know-how. In other words, it requires operating with a higher production function. However, as these are scarce factors in smallholder agriculture, its application is constrained, and the “poor but efficient” hypothesis is generally confirmed.

Third, in addition to the large-scale and smallholder farming typologies, a mixed-mode farming typology is emerging in African agriculture. In this mode, large-scale and smallholder agriculture co-exist through coordinated, synergistic and collaborative activities, based on commercialization and economies of scale. This typology is increasingly observed in labor-intensive farm production activities such as i) vegetables, fruit, sugar and dairy, which link to value-adding processing and trade, ii) grain production with scale economic advantages in off-farm storage and processing activities, and iii) livestock farming which provides animal products to large abattoirs and value-adding meat processing. This mixed-mode farm typology also supports opportunities for smallholders to depart from low-income smallholder agriculture and gain access to the higher income earning opportunities of agri-food value chains and distribution networks.

Table 4. Examples of recent African farm land developments: country, investors, and crops*

Angola	140,000 ha mixed crops, AgriSA, South Africa; 25,000 ha rice, Lonrho, UK
Benin	350,000 ha crops and 300,000 ha oil palm, South Africa
Ethiopia	815 foreign-financed agricultural projects approved between 2007 and 2010; a 150,000 ha livestock farm; 300,000 ha farm land to an Indian company, Karuturi; 50,000 ha crops by a number of South African companies, including Richmond, New Dawn, Dinaledi, Batau
Congo	68,000 ha eucalyptus, Mag Industries, Canada; 200,000 ha mixed farming, AgriSA, South Africa
Cameroon	55,000 ha mixed crops, Gp Bollere, France
Ghana	13,000 ha under crops by Kimminic, Canada
Gabon	Olam (Singapore) acquired 300,000 ha to produce palm oil
Kenya	160,000 ha biofuels by Bedford, Canada
Liberia	A Malaysian conglomerate signed a 63-year lease for 230 000 ha to grow palm oil and rubber; an Indonesian producer signed an agreement to develop 220 000 ha to produce palm oil
Madagascar	Daewoo (Korea) attempted to lease 1.3 million ha for farm production; a 450,000 ha biofuel project; mixed crops on 100,000 ha by Osho of South Africa; 30,000 ha under Jathropha by Neo, France
Mozambique	35,000 ha teak and 140 000 ha pine, Gsff, Sweden; 15,500 ha Jatropha, Avia Spa, Italy; 20 000 ha livestock, Agriterro
Mali	540 000 ha farm project; 50,000 ha rice project by Saudi Arabia; 40,000 ha crops, Seed Rock, Canada
North Sudan	South Korea companies bought 700,000 ha for wheat farming
South Sudan	800,000 ha land lease near Darfur; United Arab Emirates acquired 750,000 ha farm lands; Saudi Arabia leased 376,000 ha to grow wheat and rice
Sierra Leone	45,000 ha mixed crops, Sierra Gold, Canada
Tanzania	45,000 ha sorghum, Cams Group, UK; 100,000 ha trees, Norway; 100,000 ha Jatropha, Diligent Energy, Netherlands; 100 000 ha crops, KRC, Rep of Korea
Zambia	200,000 ha crops, United Arab Emirates; 15,000 ha sugar, Agzam, South Africa; 27,000 ha crops, DWS Galof, Germany
Ethiopia, Kenya, Madagascar, Senegal, and Mozambique	80 Indian companies invested around US\$2.4 billion in buying and leasing plantations

Sources. Connolly et al. 2012; The Land Matrix 2013.

Note. Some of these “deals” only records intentions to invest and others are projects in implementation. It however shows the degree of intent and interest in to African agricultural investment.

The expanding mixed-mode farming scenario in African agriculture will provide a sound base to introduce institutional innovations and to activate scale economic advantages in production, logistical and financial support systems, and risk mitigation. Agribusiness systems will institute the required collective actions and support systems directed at ensuring production output consistency, quality maintenance and food safety among suppliers, including smallholders. However, this will require the mobilization of community participation

for the implementation of viable project interventions in common resource situations, in other words, where community owned resources such as arable land, grazing and water are involved. This also will require establishing or supporting institutions such as cooperatives, farmer organizations, leadership and mentorship development programs, as well as skills and capacity building and effective and fair contracting and governance systems (Vorley et al. 2007; Reardon et al. 2009; Masuku 2009; Karaan 2009; Agricultural Futures 2010).

Smallholder farming will remain an important feature of Africa's agriculture, helping secure many millions of livelihoods, albeit mostly meagre ones. Socially this typology will also remain important, because it provides a fall back to many that lose their employment in the non-farming environment. Uma Lele (1984) referred to this as a residual function of smallholder agriculture that provides at least a degree of household food security to members and a refuge for the elderly and children.

Support to smallholder farming will require particular support mechanisms—public sector support and, where possible, the integration of such farming systems into supply chain-driven agri-food systems. In addition, any agricultural development framework with a focus on smallholders would have to recognize the need to empower African women and youth in particular, as these are the people mostly served by smallholder production.

Lessons from other regions (Connolly 2012) exposed to commercial farming forces, should also be analyzed. Two cases come to mind, namely the so-called miracle of the Brazilian cerrados, where poor soil was improved enabling highly productive farms, and India's support to millions of small-scale farmers which offered biotechnology tools, small packets of technology including seeds, fertilizer, herbicides, pesticides and mechanization for farmers with less than 1 ha of land, along with training and extension. The China situation, for example, the mobilization of smallholder production through the provision of modern inputs and farming innovation also provides some lessons and direction, but the notion of central planning must be considered. The African situation will require a unique set of solutions to fit the many diverse local situations.

Driver 5: Towards a Bio-based Green Economy

The idea of a bio-based green economy encapsulates a vision of a future no longer wholly dependent on fossil fuels for energy or on industrial raw materials (CGIAR 2009). "The bio-based economy could be to the 21st century what the fossil-based economy was to the 20th century" (Hardy 2002). Agriculture will be central to the bio-based economy, providing source materials for agricultural processes – liquids, fuels, chemicals and production inputs. At the same time, agriculture will continue to provide food and animal feed that is more environmentally sustainable, healthy and safe.

A bio-based economy will require agriculture to expand well beyond its current core function of food production. Positioning agriculture as a supplier of energy could be controversial, because some view this as a threat to food supply and food security, as it could potentially lead to increased food prices. However, this scenario also offers exciting opportunities. Biomass production can provide the energy needed in production processes, plus it is a renewable resource. Thus, African agriculture should explore the future possibilities of biomass with an emphasis on the next generation of biofuels, and the production of bio products (CGIAR 2009).

Pressures, preferences and trends. Consumers, private agencies in food retail and trade, and civil society organizations will continue to pressure the agri-food sector to focus on environmental integrity and sustainable production. Environmental regulation and certification, biotechnology and bio-based items – such as liquid

fuels, agrichemicals and animal feed will all be important features in the evolving commercial agribusiness environment. The establishment of environmentally sustainable and energy-saving crop and livestock systems will thus be a priority for African agri-food R&D systems. Livestock systems, which constitute the largest land-use activity on earth with their high energy to food ratios, will be particularly challenged in this context (Swanepoel et al. 2009).

Research links, networks and protocols. The Consultative Group on International Agricultural Research (CGIAR) has initiatives to establish and link global research networks. These are encouraging and must be supported in the strategic framework for African agriculture (CGIAR 2009). These enterprises promote an agricultural system striving to establish a bio-based economy that reduces water, land, nutrient and chemical use, in order to achieve the envisaged doubling of food production by 2050. Linking research networks could provide incentives to encourage and direct the new trend of commercial African agriculture to move towards greener practices. Implementing these greener practices will require establishing new science policies, good governance practices, and interdisciplinary collaboration among interested groups such as governments, scientists, civil society organizations, consumer groups, food producing businesses, farm agencies and farmers.

Systems Innovation for Economic Management and Governance

The above drivers of change in African agriculture will impact Africa's complex social, political, economic and natural environment, which is dealing with complementarities, trade-offs, redefined roles, changing institutions and long-term commitments (Timmer 2010). To achieve faster agriculture-based growth rates and equitable participation processes, favorable macro-economic and trade policies must be in place along with good governance practices, good infrastructure and access to credit, land, knowledge and markets. These will establish an enabling environment that will incentivize both small and large-scale farmers to adopt new and sustainable technologies and diversify production into higher value crop systems that can support agribusiness systems and value chains. As expected, agro industrialization in the African environment, has generally been regarded as a period of individual and collective stress, discontinuous change and economic disorder (Cook and Chaddad 2002). However, the positive, negative and neutral implications of such often maligned processes of social and economic change (Stiglitz 1988; Barry 1995) must also be noted.

For the aforementioned enabling environment to be established, sound economic management systems will be required. The following introduces the type of systems innovation needed.

Africa-Directed Trade Development

The reduction of trade barriers, especially for higher value-added products, would encourage agribusiness-driven value chains to explore lucrative opportunities in the regional and global environments. Supporting African agricultural trade will require a range of actions, including the reduction of domestic price support programs and border protection by OECD countries; development of African production and regulatory capacity to meet the exacting standards of importing global markets; reduction of inter-Africa trade barriers and red tape, which suppress the competition required for African industry to gain sustainable advantages in evolving and lucrative global markets; improved transportation systems and the addressing of impediments to efficient African rural-urban market linkages for food and fiber. It also calls for simplification of overly complex inter-African trade agreements.

Improved Public-Private Partnerships-PPPs

Collaboration between government and the private sector is also an important strategy to increasing financial, technical, human and social capacity. PPP's need to be directed to a range of activities including training, extension and skills development for farming and agribusiness activities; human capacity development through internships, mentorships and skills transfers; development of agricultural research and technology transfers; the development of information and communication systems; expansion of rural infrastructure; the establishment of agro-industrial clusters and production schemes; technical support for land reform and transfer schemes; the identification and resolution of value chain constraints and opening of opportunities as business system tipping points (Mayers and van Rooyen 2011). The provision of access to financial resources and risk mitigation instruments geared to selected agricultural development activity also needs to be structured.

Good Governance Practices and Investment Protocols

Two key components of a new paradigm and strategic framework to direct agricultural development and ensure that economic and business management processes are implemented in an accountable, transparent and responsible manner will be found in governance and investment practices. This will require institutional innovation to deal with the complexities confronting the African agricultural environment, and with matters related to competition and value distribution along value chains (IFPRI 2006, Swinnen 2007; Webber and Labaste 2009; Poultney and Lyne 2009; Gabre-Madhin 2009; World Bank 2013). Good practice investments that agitate against corruption and exploitative deals are also called for. Rural environments in particular will require new and strong institutions and governance structures to, for example, enable farmers and agribusiness groups to negotiate fair deals in agri-food value chains that are dominated by supermarkets or branded manufacturers. New governance structures will also be required to provide a fair voice to civil society and particularly women and youth in agriculture. These institutions and structures must direct the sustainable use and exploitation of natural resources, and attempt to resolve conflicts such as private versus public, individual versus community and business versus social interests.

The World Bank (2013) views the implementation of economic management and good governance as “daunting challenges for governments with weak capacity and little experience in engaging the private sector.” Good governance in African agriculture can be built through the development of social capital and collective action, where participation in such networks increases the availability of information, helps to enforce property rights regimes and reduces opportunistic behavior concerning the use of common resources such as land, water, information (Ostrom 2009). International donor agencies and private business should collaborate with public sector institutions in processes aimed at establishing and maintaining the required good governance practices.

The notion of setting good practice investment protocols to direct development patterns towards sustainable growth paths must be given priority. The engagement of private investors and agri-food corporates chasing the 20 percent plus baseline will be of vital importance. South Africa's Broad Based Black Economic Empowerment (BBBEE) codes and scorecards can be viewed as a potential model in this context. BBBEEs allocate points for transformational protocols, such as preferential procurement from historically disadvantaged groups and individuals, human capital development, equity opportunities and ownership, and corporate social investments. These South African protocols are currently in operation and provide for a range of business development models such as out-grower and equity share schemes, contracting opportunities and social services (Mabaya et al. 2011).

Reforming the legal systems to, *inter alia*, regularize land tenure systems, will support good governance and help those whose rights have not being formalized, in particular women and smallholders.

Mobilizing Civil Society, Women and Youth in African Agriculture

According to the African Women in Agricultural Research and Development (AWARD) program, women are currently the backbone of African agriculture (CGIAR 2009). According to CGIAR, women produce, process, and market most of the food that Africa depends on. Yet, women farmers receive only 5 percent of agricultural extension training and less than 10 percent of rural credit. CGIAR also documents that women represent less than a quarter of the agricultural researchers, and fewer than one in seven of the leadership. This reality needs to be addressed as a priority if smallholder farm production is to be increased and commercialized. The CGIAR view that “we cannot defeat hunger and poverty in Africa unless women have a strong voice” is echoed by most prominent institutions in their efforts to support the renewal of African agriculture.

It is also observed that young people often want to escape from the rural farming life. This is not surprising, as smallholder farming offers few financial incentives to remain working in the family business. The concept of a thriving and ever modernizing farming system, linked to technical innovation, value chains, markets and business deals, requires intellectual capacity and skills that are generally not available to the aging rural population and to farm producers. Finding a way to mobilize the youth to take up farming as a scientific and business-driven career remains a big challenge.

Support programs and funding schemes giving preference to the young and female farmers must receive priority in development strategies.

Towards a Framework Matrix for African Agribusiness Development

Core Functions and Strategic Thrusts

Future growth in African agriculture is expected to be achieved largely through increasing farm-level production mechanisms by means of: supporting land expansion, technological innovation and increased yield effects; commercializing agriculture at smallholder and large-scale farming levels; building linkages to agri-food chains that will activate intensification and value-adding opportunities for African agriculture; and applying good governance practice through institutions that direct the design and management of complex and globalizing agri-food business systems. A framework matrix can be created through the interaction of a set of core functions and development thrusts.

Core functions. An integrated development strategy needs to be designed to activate four core functions:

- Income generation, including foreign exchange, through the provision of food and fiber at primary production and value-adding levels to supply growing and differentiating global markets;
- Employment creation in the full agri-value chain and in the wider economic environment,
- Household level food security through local supply and production;
- Provision of environmentally sustainable products and services including bio-based energy and fuels.

Cross-cutting strategic development thrusts. Focusing these core actions will require five strategic thrusts for agricultural development in the sub-Saharan African environment, each cross-cutting to the four core actions:

- Stimulate market-pull opportunities: support the exploitation of prospects and opportunities opening up to African agriculture – both large and small scale in order to gain access to the growing agri-food business system and to ensure their commercially sustained inclusion (empowerment of women farmers and support to young farmers will be important in achieving this);
- Improve household level livelihoods and food security: promote the support of food security and deal with food vulnerability that is a concern of many African households in rural and urban environments;
- Promote environmental stability: design environmentally sustainable agricultural practices to support, inter alia, innovation towards the bio-based economy, and development of appropriate systems as incentives for farming communities and agribusinesses to introduce and maintain such practices in their production systems;
- Improve economic management and governance: instil leadership qualities, support good governance practices and codes—accountability, transparency, predictability, and participation, and enable agribusiness, farm producers and women-based groups to have voices in public affairs and in the designing and implementation of development plans. Develop human capacity: emphasize and support human capital development through an interactive and responsive agricultural educational and training (AET) system, providing the human capacities, skills and agents required to drive African agricultural development.

A Scenario Matrix for African Agricultural Development

The nature of the interaction between the four core activities and five cross-cutting development thrusts creates three possible scenarios (see Table 5).

Hit and Run Development (H&R). Agricultural development is driven by short-run market linkages and exploitative social and environmental practices, while governance will be driven by short run considerations, accompanied by corrupt deals to gain rapid access to natural resource potential. Development investment is segmented and only focused on the short-term prospects. Civil unrest and activist actions increasingly jeopardize a sustainable development future. Human capital development is mostly only focused on the development of short-term skills or on expatriate management and subject matter or professional expertise.

Equitable and Sustained Growth (E&SG). This scenario is the opposite of H&R. It establishes the environment and building blocks to empower African society to participate fully in the governance and management of agricultural development and to benefit from its participation in the creation of its own future. The E&SG scenario is driven by market linkages, good governance and economic management, social and environmental directed codes and protocols, and sustained and integrated human capital development at all levels – school, higher education and life-long education and training systems that identify and build needed skills.

Stop and Go (S&G). This falls between the H&R and E&SG development paths, with sporadic, opportunistic, uneven and inconsistent investments, business practices and systems. Good governance and human capital development is of a lower intensity and priority. Short-term vibrant growth and initiatives may be experienced, but there is a failure to achieve a sustained and equitable growth path for the agricultural sector, which is required in order to benefit African society at large.

Table 5. Development scenarios for African agriculture

Thrusts	Strategic Development Scenarios		
	Hit & Run Development (H&R)	Stop & Go (S&G)	Equitable & Sustained Growth (E&SG)
1. Equitable Market linkages	segmented	opportunistic	interactive
2. Social/livelihood	exploitative	uneven	equitable
3. Environmental practice	exploitative	opportunistic	sustainable
4. Governance systems	opportunistic	inconsistent	accountable
5. Human capital use	exploitative	inconsistent	empowering

Note 1. Historically, investment opportunities with returns of around 6–10 percent above inflation were viewed to be sufficient for the agriculture sector.

Note 2. “With land comes the right to withdraw the water linked to it, in most countries essentially a freebie that increasingly could be the most valuable part of the deal” (P. Brabeck-Lemanthe, Chair of Nestle, <http://dawn.com/2011/07/25/foreigners-grab-water-resources-in-africa/>)

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