Future Agricultures

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The State and Performance of African Agriculture and the Impact of Structural Changes

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Introduction

Despite ongoing changes in the structure of African economies, Africa[1] remains heavily dependent on the agricultural sector for employment, foreign exchange and as a (potential) driver of poverty reduction (World Bank 2007). Whilst only a modest proportion of the continent's land has high potential for agricultural activity, the continent's land (World Bank 2009) and water resources (You et al. 2011), plus low average yields on existing cultivated land (Deininger and Byerlee 2012), still give it considerable scope for agricultural expansion. This is significant at a time when global food and biofuel demands are rising fast, the outlook for productivity increases in other parts of the world is modest, and when Asian dominance in manufacturing constrains options for African industrial development beyond import substitution in domestic and regional markets.

However, for several decades the dominant narrative regarding African agriculture has been one of under-performance. In the 1980s the spotlight was shone on the high levels of taxation imposed on African agriculture, indirectly through exchange rate overvaluation and directly through administrative pricing and export taxes (Bates 1981; Krueger et al. 1988). Structural adjustment and related liberalisation reforms have since removed most of this taxation (Anderson and Masters 2009). Accepting Bates' view that agricultural taxation was rooted in the urban bias of African political systems, this success in removing it may be attributed to the (temporary) leverage of international donors at a time of acute fiscal crisis (Binswanger and Deininger 1997) and to the fact that agricultural stagnation, caused by high taxation, eventually undermined the benefits that agricultural taxation was supposed to bring to urban interests (Lofchie 1994). It may also be the case that falling international food prices during the 1980s and into the 1990s made it easier for governments to reduce the distortions that kept domestic food prices low, whilst at the same time countering some of the benefits to farmers from such reforms and hence restraining the supply response to structural adjustment.

The structural adjustment years were also characterised by low and declining levels of public investment in African agriculture, which limited farmers' ability to respond to improved prices. According to Fan et al. 2009 (p3-4), government spending on agriculture in Sub-Saharan Africa hardly increased at all in "2000 international dollars" terms, and fell as a proportion of both agricultural GDP and national budgets, during the 1980s and 1990s[2]. Meanwhile, official development assistance to African agriculture collapsed during the 1990s (World Bank 2007, p41).

The early years of this millennium saw increasing recognition that neglect of African agriculture had to change. In 2003 African heads of state committed to raise the share of national budgets allocated to agriculture to 10% within five years and to implement "sound policies for agricultural and rural development" to provide the framework for this increased expenditure (Assembly of the African Union 2003, p1). Internationally, the World Bank's 2008 World Development Report was perhaps the clearest signal that agriculture (especially in Africa) was back on the agenda of the traditional donors. The entry of the Bill & Melinda Gates Foundation into African agriculture has also both raised the profile of, and funding going to, the sector. The 2007-08 world food price crisis reinforced the importance of such investment.

This paper broadly accepts the "under-performance" narrative, but qualifies it by highlighting the great diversity in performance both across and within countries and regions within Africa. It then considers how African agriculture is positioned to respond to a confluence of powerful forces that are already affecting it and will do so with increasing influence over the next decade(s). The three forces that this paper focuses on are[3]:

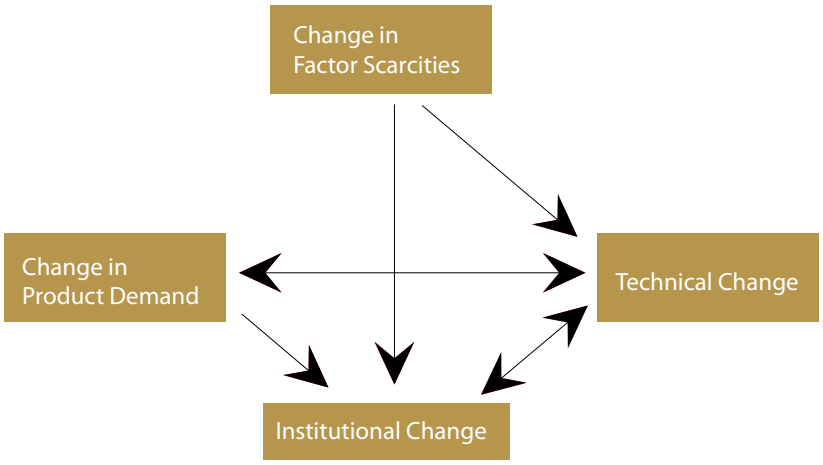
- Increased demand for agricultural products in both domestic and international markets
- Population growth (which both contributes to this demand and alters the relative scarcities of land and labour available for production)
- Democratisation (which is a partial exception, as the basic conclusion is that it is not yet exerting as much influence on agricultural policy as might be expected).

Finally, bringing several of these strands together, the paper will consider the potential consequences of increased demand for agricultural land in Africa for large-scale farming operations, which may be juxtaposed with increased population pressure on land in some areas of existing smallholder cultivation. In doing so, it will emphasise that structural change is mediated by policy choices (consistent with earlier analysis by Binswanger et al. 1995) and also the diversity both in agro-ecological conditions and factor endowments and in political conditions across the continent.

Following Hayami and Ruttan 1985, we may think of changing product demand and changing scarcities of factors of production (both of which are explored later in the paper) as encouraging both technical change and institutional change. In turn, technical change may also stimulate institutional change, whilst conversely institutional change may be necessary to encourage adoption of new technologies in response to changing product demand or changing scarcities of factors of production (Figure 1).

In relation to technical change in agriculture in low income countries, Hayami and Ruttan 1985 emphasise that responsiveness to changing product demand and changing scarcities of factors of production is required within public agricultural research institutes (amongst both scientists and administrators). This in turn requires both that such organisations are adequately resourced and funded and that there exist feedback mechanisms from (and/or accountability mechanisms to) farmers, agribusiness and other agricultural sector stakeholders,

Figure 1: Induced Technical and Institutional Change in Agricultural Development



Source: simplified from Hayami and Ruttan 1985, chapter 4

such that their needs are known and considered by research programmes.

Meanwhile, institutional change can take various forms, including the creation of new (types of) property rights and new (or greatly increased) investment in public goods. Whilst some institutional change, e.g. new models of contract farming or microfinance products targeted at seasonal agricultural production, may be initiated by the private sector entirely in response to market opportunities and competitive pressure, many changes need the state to play a role. This is likely to be true both for the creation of new (types of) property rights and for increased investment in public goods. Thus, if increasing demand for agricultural products leads to pressure to "open up" previously "under-exploited" land resources, the state can choose whether to accomplish this through granting land rights to large-scale investors or by investing in the infrastructure and services necessary to allow expansion of smallholder production on the land in question. Its decision is likely to be influenced, inter alia, by the political pressure, lobbying and financial inducements that the competing groups can bring to bear on the main decision makers, hence attention paid later in this paper to the impacts of democratisation on African agricultural policy.

Large-scale vs smallholder farming

Before reviewing the performance of the agricultural sector in Africa and assessing the forces now acting upon it, this section of the paper reviews debates on the relative efficiency, poverty impact and growth potential of smallholder vs large-scale farming in Africa, as background to the discussions in later sections.

Efficiency/competitiveness

In low wage, capital-scarce economies, manual operations in agricultural production are generally cheaper than mechanisation (which includes the initial cost of equipment, repair and operating costs, especially fuel). This advantage is reinforced where there is only one production season, such that capital equipment lies idle for much of the year[4]. Thus, there are few economies of scale in basic production activities (Binswanger and Rosenzweig 1986; Deininger and Byerlee 2012), so the initial comparison between smallholders and large-scale farms focuses on the cost of accessing factors of production and output markets. Here, smallholders are widely understood to have advantages in terms of labour motivation and supervision, whereas large-scale farms have more ready access to finance, inputs, market and technical information (Poulton et al. 2010). Large-scale farms may thus adopt more intensive production practices than smallholders and achieve higher yields as a result. However, in addition to higher input costs, they also have higher costs of labour supervision, plus overhead costs of professional management, so higher yields do not necessarily translate into lower costs of production per ton of output.

Where contracts between an agribusiness and smallholder producers can be enforced (primarily through restrictions on output market competition to limit side-marketing), a processing or exporting company may be able to combine its advantages in access to capital, technical and market information with smallholders' advantages in terms of labour motivation and supervision. Then, the optimal production arrangement is still likely to be smallholder-based.

There are, however, some circumstances in which large-scale farms enjoy efficiency advantages over smallholders. These include

- Where economies of scale in processing are combined with high costs of supply coordination necessitated by high perishability of the harvested output (Binswanger and Rosenzweig 1986). Optimal flows of the primary product into the processing factory may be more readily achieved from one or a few large-scale

suppliers than from hundreds or thousands of smallholder producers.

- Where there are strict requirements in terms of quality assurance, including traceability systems, which have a significant fixed cost per production unit

- Where production ideally requires irrigation, entailing economies of scale in the initial preparation of the land (levelling etc), but also creating high costs of managing a resettlement scheme if production is to be undertaken by smallholders.

A review of commercial agricultural experience in Africa (Poulton et al. 2008)[5] found that large-scale commercial agriculture had outperformed smallholders in export horticulture (primarily due to the high quality requirements imposed by European supermarket customers), sugar (with the partial exception of the Mumias Sugar Company in western Kenya; as a result of irrigation requirements) and flue-cured tobacco (where large investments in curing barns are required and the leaf is perishable). Tea had performed well in both smallholder and large-scale production systems. By contrast, smallholders dominate production in cotton, cashew and, most critically, staple foods.

These findings were reinforced by cost of production estimates for cassava, cotton, maize, rice, soybeans and sugar on large-scale (LCF), smallholder (FAM) and small-scale commercial (ECF) farms in Mozambique, Zambia and Nigeria (World Bank 2009), which concluded that:

> "Contrary to expectations, the analysis revealed few obvious scale economies in the African production systems analyzed for the CCAA study. Compared with LCF value chains, FAM and ECF value chains were typically found to have lower shipment values at the farm level and/or final distribution point. This result derives mainly from three factors: (a) the extensive use of low-cost family labor by smallholder farmers, (b) the higher taxes charged on inputs used by large commercial farms, and (c) the higher marginal returns to fertilizer and agrichemicals at the generally low input levels associated with smallholder production." (p87)

Within smallholder systems, there is evidence that investment in animal traction can reduce average costs of production as well as enabling a farm household to cultivate larger areas of land. Access to oxen and a plough enables rapid response to the onset of rains, with early planting commonly being important to eventual yields (Savadogo et al. 1998). Once the labour constraint at planting time is overcome, the next constraint to emerge is likely to be around weeding (again, relating to the availability of family labour and/or the cost of hiring). Hence, animal-drawn weeders have spread in some West African cotton sectors[6]. Estimates of cotton production costs per kilogram across farm households types in seven African countries in 2007 found that the top households, who employed animal traction for ploughing and/or weeding, and may or may not apply more fertiliser than other households, consistently enjoyed the lowest production costs (Tschirley et al. 2009).

As rural wages rise with development, it eventually becomes cost-effective to substitute other forms of capital for labour: power tillers then tractors for draft power; greater reliance on purchased inputs relative to manure, purchased animal feeds relative to own-sourced fodder etc (Pingali 1997). Then economies of scale in production do start to emerge. However, Asian experience teaches that this only occurs once development in the non-farm economy has proceeded sufficiently (i.e. absorbed enough labour) to put significant upward pressure on rural labour rates. At this point, some consolidation of farm holdings also becomes necessary to enable rural incomes to maintain some comparability with what can be readily earned in urban occupations (Pingali 1997; Timmer 2009). In the more advanced economies of East Asia, these trends only became evident almost 40 years after the onset of the green revolution (Pingali 1997), so these dynamics can be discounted in most of Africa for some time to come.

Whilst the summary just provided may be described as "conventional wisdom", Collier and Dercon 2009 argue that it is now out of date due to the growth of massive agribusiness production enterprises, in particular in Latin America and Central Asia. Deininger and Byerlee 2012 describe some of these enterprises. Whilst managed in production sub-units, a single conglomerate can operate hundreds of thousands of hectare. This scale is sought in order to support dedicated investments in handling and commodity export. In other words, economies of scale in marketing drive scale of production. Production, of course, is fully mechanised, with computer aided precision farming techniques being used to minimise labour supervision problems; the management challenge is to keep costs as low as possible and quality as even as possible whilst achieving the desired scale.

Could such enterprises operate successfully in Africa? This has yet to be tested, but in theory they could, if the land is made available. Given their scale (and rationale), they would inevitably be export oriented. They would employ remarkably little labour for the land area covered.

Poverty impacts of large-scale vs smallholder farming

Agricultural growth is one of the most effective sources of poverty reduction in agrarian economies such as most of those in Africa (see, for example, Ligon and Sadoulet 2007 and other references summarised in World Bank 2007). High growth multipliers arise from the use of intermediate inputs, supply of output to agro-processing enterprises and, most importantly, through the consumption patterns of those whose incomes gain from increased agricultural production. In addition, lower food prices resulting from increased productivity in staples production benefit net food buyers, who include

most of the poor, and have the potential to support the expansion of manufacturing and service activity by exerting a moderating influence on wage rates.

For a given growth in output, a greater poverty impact is typically observed when growth originates within smallholder systems than when it originates within large farms (see, for example, Bautista and Thomas 1999). This is because: 1) more revenue goes directly to poor households as suppliers of land; 2) smallholder production is generally more labour intensive, so more revenue also goes to poor households as suppliers of labour (either family or hired labour), and 3) the consumption patterns of these poor households - oriented heavily towards local food purchases and purchases of other local goods and services (Delgado et al. 1998) - create greater multiplier benefits for other poor households within their local economies.

A much more contentious point is whether or not it is easier to achieve growth through promotion of large-scale farming. Small farm sceptics such as Collier 2008 advocate promotion of large-scale farming at least in part out of apparent frustration at the historic difficulties in achieving sustained smallholder agricultural growth in Africa. Large farm growth requires basic macro-economic stability (manageable swings in real exchange rate, currency convertibility, moderate inflation), reasonable trunk infrastructure (ports, roads and/or railways, telecommunications) and basic security of property rights (clear legal rights and the political commitment to honour these). With these in place, competent large-scale operations can access finance, technical expertise, appropriate inputs and output markets (either nationally or internationally) without further assistance. They may invest in local infrastructure to support their operations both on- and off-farm.

By contrast, the small scale of operation and hence transaction sizes of a smallholder farm mean that it can only profitably access support services and markets that are brought close to the farm gate, and that it is entirely dependent on infrastructure provided by others. Collective action on the part of smallholder producers can enhance market access, but carries its own time and related costs and is only effective and sustainable where strong leadership and good governance arrangements are in place. Hence, much of the burden of reaching smallholder producers remains with the service providers, who have to find innovative ways both of delivering individual services efficiently to small, poor and dispersed clients and of coordinating service provision, as there are complementarities for farmers in accessing multiple services (extension advice, finance, input supply, output markets) and hence benefits to suppliers where complementary services are also available. Where processing or exporting companies have the incentives to invest in contract farming, then the full range of complementary services may be provided to a smallholder by a single service provider. However, such services generally only benefit one crop within the production portfolio – cases of spillover benefits to staple food crops (Govereh et al. 1999) notwithstanding – and are not available to most crops. The majority of output of Africa's smallholders is produced without access to one or more of the desirable supporting services, let alone clear mechanisms – even on paper – for ensuring coordination across services and providers (Poulton and Lyne 2009; Poulton et al. 2010).

Thus, smallholder agricultural development faces two challenges not faced by large-scale agriculture, both of which relate to the role of the state and hence highlight the weakness of most African states in supporting smallholders:

- additional budgetary requirements for local infrastructure and for those services that are publicly provided to smallholders, most notably extension, backed by public agricultural research efforts.

- mechanisms and capacity to effectively coordinate provision of pre- and post-harvest services to smallholders. Precisely what is required here will depend on local context, but prerequisites are a degree of sympathy for, and understanding of, the situations of potential private and non-government service providers, and sufficiently strong incentives to see services delivered that innovation and learning in service promotion and coordination result.

Maertens and Swinnen 2007 provide a striking example of the poverty reduction benefits of large-scale agricultural development: export horticulture in Senegal. Here, early smallholder-based growth was forestalled by changes in quality assurance and traceability requirements in European markets. However, large-scale enterprises have thrived and the resulting expansion of production has benefited large numbers of poor households who work as labourers on the large-scale horticultural farms. Care is needed in extrapolating from this case, however. Horticulture and floriculture are amongst the most labour-intensive of large-scale farming operations; the advantages of large farms are in quality assurance (where markets demand this), whilst production methods retain a large element of hand labour. Thus, the findings of poverty impact cannot simply be generalised to all large-scale farming development.

Finally, it is important to note that, whilst international development discourse focuses on poverty reduction – and through the Millennium Development Goals and Poverty Reduction Strategy Papers has had considerable success in translating this concern to formal national policies – the objectives of politicians are first and foremost to obtain then maintain power. This can lead to "policy in practice" that is dramatically different from formally stated policy (van de Walle 2001; Drazen 2008; Poulton 2012). Policy decisions can be driven by private rent-seeking considerations or may prioritise low urban food prices or foreign exchange earnings over maximal poverty reduction. This is an issue that we return to below.

Under-performance of African agriculture?

Any review of African agricultural performance has to recognise the enormous issues of data quality that exist and be somewhat cautious in drawing conclusions as a result. With that major caveat in mind, we observe the following.

Firstly, at continental level, agricultural growth has been modest in recent decades – at least in comparison to population growth - and has shown no obvious increase since the 2003 Maputo Declaration. Table 1 shows FAOstat data for the gross value of agricultural production (covering both crops and livestock products) in constant 2004-2006 local currency units, plus data on agricultural value added in constant local currency units, available from the World Bank's 2012 World Development Indicators, over the period 1972/74-2008/10. It also compares growth in the value of agricultural production with the aggregate rate of population growth in Sub-Saharan Africa. At this level of aggregation, there is some consistency in the story told by the two datasets. Agricultural growth was slowest in the decade prior to structural adjustment – indicative of the need for reform. It increased during the first decade of structural adjustment, but was still below the rate of population growth. It increased again during the decade 1992/94-2002/04, i.e. the period leading up to the Maputo Declaration, when African agriculture was widely perceived as neglected by both national governments and donors, only to decline slightly in the period since the Maputo Declaration. Whilst the average annual growth rate in agricultural production value remains higher than it was in the early years of structural adjustment and also above the (gradually declining) rate of population growth for Sub-Saharan Africa, it remains well below the 6% p.a. growth in agricultural value added targeted by the Comprehensive Africa Agriculture Development Programme (CAADP).

Staple food production is a particular concern. In per capita terms, staple food production in Africa has grown slowly since the mid-1980s, but is still only now at the levels of the 1960s or early 1970s (Wiggins and Leturque 2010). FAOstat data show average maize yields across the continent rising from 1.5 tons per hectare in 1978-80 to only 1.7 tons per hectare in 1998-2000 and 2.0 tons per hectare in 2008-10[7], but with almost no progress over time in Eastern Africa. Food imports have been rising over time due to 1% p.a. increase in per capita consumption levels (FAO 2011) plus growing urban preference for wheat and rice (Jayne et al. 2006).

Limited agricultural growth in general and stagnant food production per capita in particular contribute to continued high undernourishment and child malnutrition (Wiggins and Leturque 2010), whilst in aggregate Sub-Saharan Africa remains well off course to achieve the first Millennium Development Goal of halving the proportion of people living in extreme poverty (United Nations 2012).

Secondly, however, there is considerable variation in agricultural growth performance and in progress in reducing under-nourishment across and within regions and countries. At regional level, West Africa appears to be performing much better than other regions of Sub-Saharan Africa in terms of food availability and undernourishment, albeit not in terms of children's under-weight - a bit of a puzzle? (Wiggins and Leturque 2010). There are various narratives to explain the superior performance in terms of food production, including: widespread investment in soil and water conservation, tree planting and communal organisations (Wiggins and Leturque 2010; see also Garrity et al. 2010 on trees); policies to support food production in cotton areas through cotton chains and rice in the Office du Niger; market incentives deriving from the greater density of small towns in West Africa, and (depending on the time period considered) the impact of the Nigerian recovery from agricultural implosion starting around 1985 and/or the devaluation of the FCFA franc in 1994 (Hazell and Poulton 2007). However, whilst these may be contributory factors, they are all essentially hypotheses and, moreover, do not necessarily get down to the fundamental drivers of better performance.

Table 1: Growth in value of African agricultural production (% p.a.)

	Gross value of agricultural production, constant 2004-2006 local currency units (source = FAOstat)	Agricultural value added, constant local currency units (source = 2012 World Development Indicators)	Sub-Saharan Africa population growth (source = 2012 World Development Indicators)
1972/74-1982/84	1.5% p.a. (n=31)	2.0% p.a. (n=32)	2.8% p.a.
1982/84-1992/94	2.8% p.a. (n=31)	2.2% p.a. (n=40)	2.8% p.a.
1992/94-2002/04	3.1% p.a. (n=32)	3.0% p.a. (n=45)	2.6% p.a.
2002/04-2008/10	3.0% p.a. (n=32)	2.5% p.a. (n=35)	2.5% p.a.

Notes: As data in local currency units cannot meaningfully be summed, a growth rate is calculated for each country, then an unweighted average of these figures is calculated for the table. If growth in agricultural value added is only averaged across the 21 countries for which WDI (2012) presents data for all four periods, then the average growth rates are 1.4%, 2.4%, 2.2% and 2.1% p.a. respectively across these periods.

At country level, both of the data sources cited in Table 1 show considerable diversity of performance. For both 1992/94-2002/04 and 2002/04-2008/10 for both datasets, there are countries where the value of agricultural production in constant local prices grew by 5-10% p.a. and also countries that registered no growth or experienced contraction. Unfortunately, the two sources only partially agree on how fast the value of agricultural production in individual countries has been growing (see Appendix 1). A little of the diversity of country experience is considered later in the paper.

Within countries, there is diversity, too: village studies show that areas with reasonable agricultural potential and good market access have often done better than areas without (Wiggins 2000). This raises the question as to whether the binding constraint to production has been on the demand or the supply side (or possibly in the transmission of demand to producers due to poor infrastructure and high costs of information). A concern of Diao et al. 2003 is that demand for agricultural products in Africa may be too weak to absorb large production increases without sharp falls in prices (as happened in Ethiopia in 2001-02), thereby discouraging producers. On the supply side, however, the village studies could be read as showing that, in a context of weak state investment and support to smallholder production and agricultural market development, it is generally only in those areas that are fortunate in terms of geography and agro-ecology and/or which have benefitted from what little state investment has been forthcoming where markets have been able to function well and hence producers have been able to respond to consumer demand.

Public investment in African agriculture

A central tenet of the argument in the paper is that sustained public investment is required to stimulate smallholder agricultural growth in Africa[8]. Fan and Chan-Kang 2004 argue that, historically, investment in most of rural Africa has been so low that high returns (in terms of growth and poverty alleviation) can still be expected from public investments in both high potential and less favoured areas.

Fan et al. 2009 report that, for the 13 countries listed above in footnote 2, government spending on agriculture grew between 2000 and 2005 by 100%, 75% and 66% in "2000 international dollars" terms, as a proportion of agricultural GDP and as a proportion of national budgets respectively. However, they also report that, in 2007 (or the nearest year for which data were available) only eight countries had met their Maputo Declaration target of a 10% share of national budget devoted to agriculture and rural development, whilst 16 recorded budget shares of 5-10% and 14 recorded shares below 5%.

A related element of the Maputo Declaration was a pledge to "Implement, as a matter of urgency, the Comprehensive Africa Agriculture Development Programme (CAADP) and flagship projects and evolving Action Plans for agricultural development, at the national, regional and continental levels" (Assembly of the African Union 2003, p1). Whilst the CAADP process of formulating strategies and investment plans has since gained considerable donor support, it has been subject to almost no independent review to date. However, an assessment of the CAADP process in Ghana by Kolavalli et al. 2010 found it difficult to attribute real change in policy making to the process. Whilst the budget for agriculture has risen in Ghana in recent years, this may have happened without CAADP. CAADP did make available additional resources for modelling to inform the investment plan, but the development of this plan coincided with the development of a new agricultural strategy that was happening anyway and ultimately it was still largely based on local stocktaking and prioritisation (i.e. how strong was the evidence base and how much was it used?). Perhaps most importantly, the CAADP process may be insufficient to shift fundamental drivers of policy: "cabinet members in Ghana are often taken to retreats to discuss budgets" (p20) and have their own perceptions of the priority of investing in agriculture (for both economic and political reasons) and of where donors really want to see investment. If the agricultural sector is not "politically strong enough to attract funds" (p22), then cabinet decisions are unlikely to be swayed by discussions in a round table forum such as that created by CAADP.

Ongoing research by Future Agricultures Consortium is exploring the added value from the CAADP process. Its starting hypothesis is that countries with strong domestic political incentives to invest in agriculture will tend to embrace the CAADP process quite fully – gaining international "credit" and perhaps some incremental funding from doing so – but would have demonstrated commitment to agricultural growth anyway. Meanwhile, countries with weak domestic political incentives to invest in agriculture will tend to comply (more belatedly) with the process, primarily as a "box ticking" exercise with donors. In both cases, CAADP documents are often simply repackaged versions of existing policy/strategy documents.

Agricultural research has a clear link to agricultural growth and from there to poverty reduction (Thirtle et al. 2003; Alene and Coulibaly 2009). Its importance was highlighted in the discussion of Figure 1 above. Beintema and Stads 2004 noted with concern stagnation in investment in agricultural research in Africa during the 1990s. Beintema and Stads 2011 report that total investment increased by 20% from 2000-08. "Most of this growth, however, occurred in only a handful of countries [most notably Nigeria] and was largely the result of increased government commitments to augment incommensurately low salary levels and to rehabilitate neglected infrastructure, often after years of underinvestment" (p.viii). In 2008 50% of all investment occurred in just three countries - Nigeria, South Africa and Kenya – whilst in many other countries, particularly in francophone West Africa, domestic funding was so

low that they were "dangerously dependent on often volatile, external funding sources". Only eight countries devoted more than 1% of agricultural GDP to research investment in 2008.

Reviewing successes in commercial agriculture in Africa, Poulton et al. 2008 (p5) observed that, "breakthroughs and/or ongoing progress in research (new crop varieties, pest and disease control, labour saving technology for both pre- and post-harvest operations) created the possibility for commercial agricultural success in several commodities. However, strikingly, none of these research advances was the result of research both conducted within national agricultural research institutes and funded by national government expenditure". Instead, notable breakthroughs came either from research undertaken prior to independence or within international (CGIAR) centres situated within the continent. Alene and Coulibaly 2009 highlight the importance of CGIAR investment in agricultural research in Africa and the work of CGIAR centres alongside national agricultural research organisations. According to their analysis, more than half of the poverty reduction impact of agricultural research in Africa may be ascribed to CGIAR activities. Consistent with the earlier findings of Thirtle et al. 2003, they also find that national research programmes in some African countries are simply too small to make meaningful impact, whereas returns to investments made by larger programmes can be very high. Poulton et al. 2008 concluded that, "African governments need to take agricultural research more seriously, which involves not just putting more money into research, but looking seriously at the performance incentives for researchers and management in national agricultural research institutes" (p5). This is an area where Africa can clearly learn useful lessons from Brazil (World Bank 2009; Beintema and Stads 2011).

Agricultural extension is another classic public good that has been widely neglected by African governments. Davis 2008 reviews the state of extension in Africa. She reports on a range of at-times-innovative approaches being pursued in countries such as Kenya, Uganda, Ethiopia and Ghana. However, most of these are being promoted by donors. With the exception of Ethiopia (and until recently perhaps also Uganda), there is little evidence of concerted effort to improve extension emanating from within African governments themselves.

The Ethiopian case highlights the importance of understanding the politics of agricultural policy making. Using a Sasakawa estimate (cited by Davis 2008) that there were 150,000 extension workers in Africa in 2000, plus subsequent growth in extension staffing in Ethiopia (Davis et al. 2010), it seems possible that around 25% of all extension staff in Africa are now found in Ethiopia and that this figure could soon rise to 30%. The Ethiopian government has exhibited a strong commitment to investment in extension since at least 1995 and there is some evidence of the growth and poverty reduction benefits of this effort (Dercon et al. 2008). Berhanu 2012 argues that the government's relatively narrow base of core support, combined with multiple internal and external threats to its hold on power, has forced it to seek legitimacy through efforts to stimulate broad-based agricultural growth. The two previous regimes in the country were both eventually overthrown in part because they neglected rural areas, which then became support bases for armed opposition movements. Investment in extension has been central to the government's efforts to stimulate agricultural growth. However, Berhanu 2012 also argues that the deployment of extension agents to every village in the country has been part of the government's strategy for achieving political control and, moreover, that the imperatives of this strategy have reduced the effectiveness of the investment in extension from an economic perspective.

Finally, irrigation (You et al. 2011) and transport (road and port) infrastructure are other vital areas where much more public investment is needed (Commission for Africa 2005). Poor transport networks give African farmers some protection against international competition in inland markets, but impede their ability to compete in international markets or indeed in the markets of Africa's own large and growing coastal cities (World Bank 2009). Poulton et al. 2008 observed that African countries had achieved export success only where agro-ecological conditions were "ideal" for the crop/product in question and/or where aspects of the production process were very labour intensive and difficult to substitute with mechanisation[9]. They argued that, "major advantages in either the agro-ecological environment or labour costs are needed in Africa to offset the generally high costs of capital, transport and even land in production and marketing, plus generally poor institutions" (p22). They also observed that export success had been restricted to medium or high value commodities ("high value because either agro-ecological conditions or high labour costs inhibit their total global supply"). There are no clear examples of export success in lower value commodities, such as food staples. High value "allows African supply systems to recoup their inherently high costs", but returns to producers remain low as a result of those costs.

Opportunities and threats facing African agriculture

Having under-performed (on average) in the past, African agriculture faces a number of major opportunities and threats in the future. This section discusses three of them.

Increased demand for agricultural products

A major opportunity – although some "threats" could be nested within this – comes in the form of increasing demand for agricultural products in both domestic and international markets. Domestic demand is primarily for food, driven by continued population growth, urbanisation[10] and (hopefully) income growth. Diao et

al. 2003 argue persuasively that there is much greater expansion potential within domestic markets than for Africa's traditional agricultural exports. In particular, one might expect increased demand for livestock products, fruit and vegetables, as incomes rise and diversity of food consumption increases. Evidence of this is hard to find in historic FAOstat data, however. Using data in constant 2004-06 US$, there was no decline in the share of total value of agricultural production accounted for by cereals between 1978-80 (16%) and 2008-10 (17%), nor rise in the share of livestock (falling from 23-19%) or major fruits and vegetables (falling from 11-10%). This is perhaps indicative of the slow rate of average income growth to date.

The global story of dramatic supermarket growth in recent decades (Reardon et al. 2003) is now widely appreciated. Weatherspoon and Reardon 2003 document significant supermarket growth and/or penetration in South Africa, Kenya and Zambia, with potential impacts on supply chains and perhaps also on agrarian structure. Neven et al. 2009 shows that growth of supermarket sales of fresh produce in Nairobi has encouraged the emergence of new small-scale commercial farmers - urban-based, hence with good contacts to retailers, and able to invest funds generated from urban employment in dedicated horticultural enterprises, including irrigation systems and hired labour[11]. However, the likely impact of supermarket growth on agricultural supply chains and agrarian structure in most of Africa over the next decade (or perhaps more) should not be overstated, given the still limited rate of growth of median incomes. Reardon and Timmer 2005 describe much of Africa as being in a (pending) "fourth wave" of supermarket expansion, where 'It is unlikely that the lower end of this set of countries we will see supermarket growth for several decades' (p. 2382).

Internationally, food price rises in recent years have been driven inter alia by rapid income growth in Asia, leading to growing demand for livestock products and feed. This has stretched supply capacity, despite the massive expansion of soybean production in Brazil and elsewhere. At the same time, the rising price of fuel has both contributed to increasing costs of production and triggered demand for maize, sugar and palm oil as biofuels (often policy-induced). As markets have tightened, short-term supply shocks – increasingly frequent under climate change? – can lead to quite sharp falls in stock-use ratios, creating conditions of panic buying (in turn magnified by government trade policy responses in surplus countries) and/or where speculators can bid up prices (Piesse and Thirtle 2009).

Globally, there is a debate as to how serious the impacts of the 2007-08 price rises were on poor consumers (Ivanic and Martin 2008; Headey 2011). However, it seems likely that there were negative impacts in much of Africa, severe in places. In the medium-term, a supply response is to be expected, not least because prices have continued to spike subsequently and are expected to remain above mid-2000s levels for some years to come. With its under-developed agricultural potential, Africa has become the focus of considerable interest from international investors as a result of the crisis (see final section). Politically, urban-based elites may also feel the need to pay more attention to agriculture, as reliance on imports of cheap food from the world market is not an option for the time being. However, whether or not this translates into improved policies and investment for smallholder agriculture remains to be seen.

Population growth

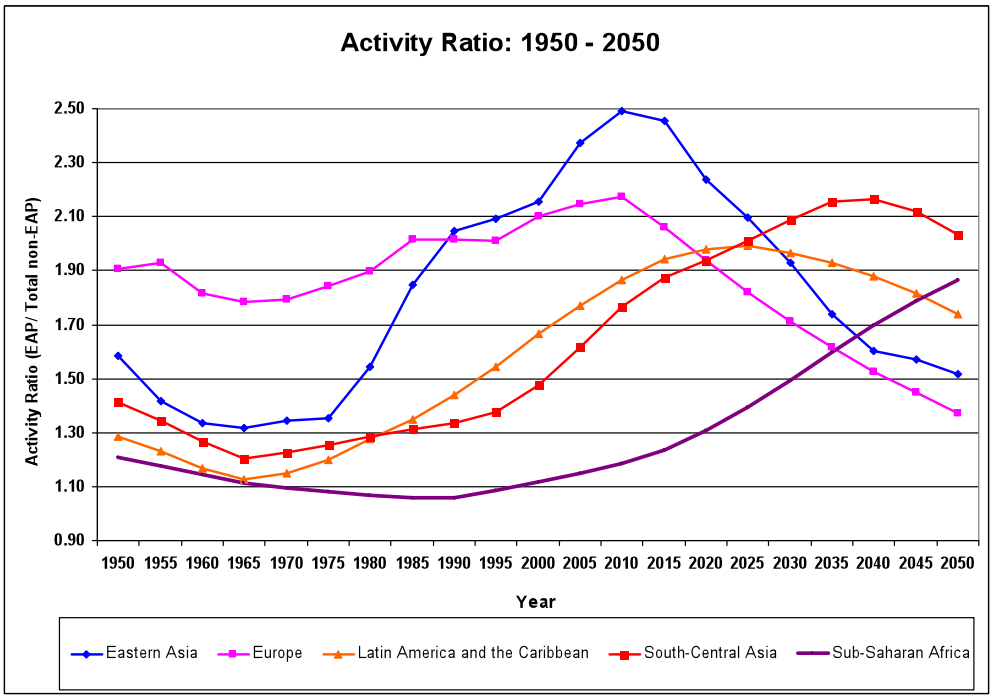
Although the paper has noted differential agricultural performance both across and within countries and regions of Africa, it has not so far emphasised the diversity in basic conditions within the continent. This diversity encompasses agro-ecological conditions, whether a country is landlocked or not, whether it possesses mineral resources or not, and population density, amongst other factors. Across the eight countries covered by Future Agricultures Consortium's PEAPA study, population density varies dramatically from Mozambique (29 persons per km2 in 2008) and Tanzania (48 persons per km2) to Malawi (158 persons per km2) and Rwanda (394 persons per km2). In the remaining four countries, a noteworthy feature is the variation in population density within the country (for example, between highlands and semi-arid lands in Kenya and Ethiopia and between more densely populated southern regions and more sparsely populated northern regions in Ghana and Burkina Faso).

Increasing population has already been noted as a contributor to demand growth for African agriculture, but it also affects the supply side. It is not a new phenomenon; indeed, Table 1 showed the rate of population growth to be slowing. This slowing represents a tremendous opportunity for Africa, as the activity ratio within the population (the inverse of the dependency ratio) is now projected to rise for several decades (Figure 2). If the increased proportion of economically active people can be given meaningful employment (a big "if", however!), this will give a major boost to growth and poverty reduction efforts on the continent.

On the other hand, the ongoing rise in absolute population sizes, most of which people still reside in rural areas, puts a major strain on available land resources. In smallholder areas, this has been leading to ever smaller farm sizes (Jayne et al. 2003; Ellis 2005), but also to growing inequality amongst smallholders (Jayne et al. 2003; Jayne et al. 2012) as better connected households prove more adept at protecting their entitlements. According to Jayne et al. 2012 (p2): "in at least four of the 10 countries analyzed, 25% of the rural population resides in areas exceeding 500 persons per square kilometer, estimated by secondary sources as an indicative maximum carrying capacity for areas of rain-fed agriculture in the region".

Whilst many studies find an inverse relationship between farm size and efficiency – relevant to the debates about smallholder vs large-scale farms summarised above – some studies have found a positive relationship at the lowest end of the smallholder size range (Collier

Figure 2: Activity ratio by region



Source: data from World Population Prospects (2006), presented in Losch et al. 2008

and Dercon 2009; see Dorward 1999 for an example from Malawi). When land holdings become too small, poor households with limited opportunities for off-farm income generation can no longer afford purchased inputs and may also have to sell their labour to buy food at precisely the time they should be applying it to their own plots, thereby reducing yields and creating a vicious cycle. Jayne and Muyanga 2012 investigate similar dynamics at an area level in Kenya and find that average household welfare is affected where population densities exceed 600-650 persons per km2. Currently almost 15% of the Kenyan rural population live in areas of this density or greater.

These negative dynamics from "excessive" population densities suggest that some of the critical response mechanisms in the induced innovation model posited in Figure 1 are not functioning. This may indicate poor performance of the agricultural research system, although the Kenyan system is one of the strongest in Africa according to Beintema and Stads 2011. More convincing is the argument that political feedback mechanisms are ineffective: politicians have been unresponsive to the developing threat to agricultural productivity in parts of the country as populations increase. In Indonesia, one of the most densely populated Asian countries, several decades ago President Suharto knew that he could only stay in power if he attended to the needs of his poor rural population. This meant major and sustained investment in the agricultural sector, including subsidised fertiliser and seed supply and, perhaps most critically given population densities, irrigation. (For a discussion of this, see Henley et al. 2012 and other papers in the same issue. Henley argues that the "inclusive" social and economic vision of Indonesia's policy technocrats was also important). Unfortunately, as explained above, this sort of response has not yet been forthcoming from most African policy makers[12].

Meanwhile, in some countries, high and rising populations in some areas co-exist with large areas of land that are widely (though probably unhelpfully – see below) seen as "under-utilised" (World Bank 2009).

Democratisation[13]

Bates 1981 analysis of urban orientation of African policy makers was undertaken prior to the widespread introduction of competitive multi-party elections that began in the early 1990s. In the one-party era of the 1970s, policy makers were able to prioritise urban interests against the interests of the rural majority by "buying off" rural leaders through targeted distribution of cheap inputs, credits and other benefits. This policy divided progressive farmers from the majority of rural producers. Many of the former chose to become part of the ruling party, so as to gain access to inputs and credit, whilst the latter were left leaderless. Instead of agitating for better agricultural policies and prices, rural leaders competed to bring projects to their areas, as sources of local patronage.

Under democratisation, however, the greater numbers of poor rural households could in theory translate into political clout via the ballot box. To obtain and maintain power, politicians should have to demonstrate responsiveness to the needs of the rural majority, as in Figure 1. Critically, however, this assumes that voters exchange their votes for policies that further their economic interests. Poulton 2012 reviews literature on this, including a number of studies using Afrobarometer data, and observes that votes are procured in a number of ways, including through ethnic appeals, the delivery

of local public and private goods (hence the proliferation of constituency development funds as democratisation proceeds) and social control exercised through local chiefs or the influence of local state-party officials over land allocation and other handouts. Quantitative studies such as Bratton et al. 2011, plus case studies conducted for Future Agricultures Consortium, indicate that better policy is often part of this mix. However, it is rarely the dominant form of appeal. Moreover, as argued by Kjaer and Therkildsen 2011, the policies that are offered are more likely to be transfers (fertiliser subsidies, regional club goods – things that are immediate and easily linked to the politicians in question) than investment in public goods such as research and extension. Such public goods take time to deliver results. Moreover, where ethnic identity is stronger than socio-economic identity (such that a poor Luo farmer in western Kenya perceives more of a common interest with members of the Luo elite than with a poor Kikuyu farmer in central Kenya), there is a lack of effective (political) demand for such national public goods.

For somewhat similar reasons (the weakness of the voice of the poor) the literature on decentralisation reaches similar conclusions: that decentralisation has yet to deliver more responsive services to the rural poor in Africa (Cabral 2011).

Whilst the basic conclusion is that democratisation has so far only generated weak political incentives for broad-based, pro-smallholder agricultural policy, there are a small number of countries in Africa where the incentives appear much stronger. One source of heightened incentive is a sustained threat to regime survival. An actual or latent military threat to a regime may endanger elites as well as the poor - thereby creating some alignment in the interests of elites and citizenry. It can also force rulers to depend more heavily on citizens for taxation for national defence. According to Campos and Root 1996, the huge Communist threat throughout East Asia in the 1950s and 1960s created the political incentives for the rapid economic growth experienced by South Korea and Taiwan starting in the 1960s. The external threat was particularly acute for both South Korea and Taiwan, but in addition there was some internal sympathy for the Communist cause within both states (along with others in East and South-east Asia). In both countries agrarian reform was one of the first major policy acts, designed to increase the number of rural dwellers with their own stake in the land and to demonstrate an attractive alternative to collective ownership of assets. Leaders realized that an interventionist state was desirable to stimulate the rapid growth needed to generate resources for defence. However, the state also had to be as efficient as possible, which led to an effective, outcome-based management of the bureaucracy, along with clear and enforced performance targets for enterprises seeking support from the state (Stiglitz 1996; Khan 2000). Meanwhile, rapid growth implied sacrifices (most notably, a very high savings rate), so it was imperative that growth was as broad-based as possible. In a low-income context, broad-based growth typically means investment in smallholder agriculture alongside stimulation of investment in labour-intensive manufacturing that gradually pulls labour out of the agricultural sector. This enabled the government to keep enough of its citizens "on side", despite significant restrictions on political freedom, and enabled it to gradually win over Communist sympathizers.

Within Future Agricultures Consortium's PEAPA study, two countries that face circumstances analogous to those experienced by 1950s and 1960s South Korea and Taiwan are Rwanda and Ethiopia. The Ethiopian case has already been briefly discussed in the context of agricultural extension above.

In Rwanda a government centred on the Tutsi-dominated Rwandan Patriotic Front (RPF) continues to be confronted by Hutu rebel groups just across its borders whilst governing a population that is majority Hutu. It continually needs to generate resources for defence (a short-term imperative), but it also faces major long-term challenges. The first of these is to prevent the country from slipping back into the type of devastating ethnic violence that erupted in 1994. The second is that it cannot win an election under full political liberalization[14] as long as voting preferences are determined primarily by ethnic allegiances. Whilst it can resort to political control for some time, this will only get more difficult as time goes on. Its economic strategy, therefore, is to push for rapid and broad-based growth, much as South Korea and Taiwan did. This includes the recent emphasis on agriculture and – in the absence of credible manufacturing options in a small landlocked country (Collier 2007) – internet-based service industries, requiring major investment in both infrastructure and education. The logic seems to be that, if enough people benefit from growth and gain a sufficient stake in economic prosperity, then eventually elections will be fought on the basis of policy, rather than ethnicity[15], as voters recognize the cost of a return to ethnic conflict. The present government should then stand a good chance of winning even if electoral rules are liberalised.

The imperative of sustained growth – looking beyond a single electoral cycle, but nevertheless to be achieved as rapidly as possible - in turn creates incentives for systemic reforms in areas where neighbouring governments may only tinker superficially, e.g. agricultural support services (see also the sustained investment in extension in Ethiopia). As in South Korea and Taiwan, outcome-based management of the bureaucracy is being developed in Rwanda to enhance the efficiency with which state agencies perform their roles – encouraged, inter alia, by the annual leadership retreat and Annual National Dialogue. All this said, agricultural policy received relatively low priority in the first decade of RPF-led rule after 1994. It was only after the shock of two poor harvests in 2003-04 and disappointing poverty figures in 2006 that it rose up the agenda. Since then, efforts to make up for lost time have been impressive and include a programme for distributing subsidized inputs, irrigation of valley-bottom marshlands (especially for

rice), promotion of synchronised planting and harvesting by smallholders in service cooperatives, promotion of sound intensification principles by extension staff and the promotion of a national 'one cow per family' policy. A feature of agricultural policy making in Rwanda, which should not be unusual in Africa but is, is that it appears to learn from past mistakes (Booth and Golooba-Mutebi 2012), which is evidence of a regime that knows it has to perform.

Conditions in Rwanda and Ethiopia cannot be "replicated" elsewhere in Africa - nor would it be desirable to try to do so! Therefore, the question is what can be done to strengthen the voice of smallholder farmers and other poor rural groups within the context of democratising politics. Recent political history in Latin America may provide some clues here. Many countries in Latin America threw off their dictatorial rulers in protest at the hardships suffered during their first decade of structural adjustment in the 1980s. However, popular expectations of more pro-poor policies were initially disappointed, as the first wave of democratically elected rulers retained many of the policies of their military predecessors. The result was a dramatic rise of so-called social movements in many countries of the sub-continent (Vanden 2007) that raised awareness amongst poor voters of their common ("class") interests[16] and supported a new breed of political candidate to stand against traditional political patrons. Around the turn of the millennium left-wing governments (either social democratic or populist) were returned to power in the majority of countries of the region and some progress has been made in reducing traditionally high inequality in some countries (Lustig 2009). In some of these countries, the left-wing governments have now been voted out again, but in Chile, for example, some of the central policies introduced in the past decade have been retained by the incoming government.

Much of Africa is now almost 20 years into the democratization process, but there is little evidence that mobilization of class-based awareness is yet taking place. Reasons for this could include that Africa lacks Latin America's history of trade unionism, has no comparable experience of liberation theology or related teachings amongst the poor, and has lower average education levels (although these are now rising). Pessimistically, Khan 2005 argues that class-based politics follow economic transformation more than they contribute to it. There are, therefore, major unanswered questions as to how effective one can expect civil society organisations to be in mobilising poor rural voters and pressurising African governments to deliver more pro-poor agricultural policy. Are there useful investments that donors could make in support of civil society "demand"? If so, over what time-frame might results realistically be seen (10 years, 20 years)?

The expansion of large-scale farming in Africa

As noted above, as a result of rising global food prices and demand for biofuels, land in rural Africa has become the focus of considerable interest from investors in recent years. Much debate has been focused on the international investors amongst them, but considerable tracts of land have also been allocated to domestic commercial and other interests (Dessalegn Ramato 2011; Deininger and Byerlee 2012). What does this mean for the future trajectory of African agriculture? Will it be good for the poor?

Anseeuw et al. 2012 is probably the best available overview of recent transnational land deals, in Africa and elsewhere, although the LandPortal database on which their review is based has been subject to criticism. Anseeuw et al. 2012 categorise recent transnational land deals according to four major commodity interests, each of which is associated with particular types of players:

1. Those claiming to want to grow food crops are mainly Gulf and Asian investors (often parastatal companies) with an interest in supplying their home markets. Gulf countries, in particular, with their extreme dependence on international food trade for food supplies, realised the vulnerability of this position during 2008;

2. Others claim to want to grow biofuel crops - essentially jatropha in Africa (rubber in south-east Asia). In terms of the number of deals, but not in terms of land area, land acquisitions supposedly for biofuel production in Africa are dominated by UK private investors;

3. South African companies have been active in acquiring land to grow so-called "flex crops" – which can be sold into either food or biofuel markets, depending on relative market conditions - in other African countries. In Africa (and also in Latin America, where Argentinian and Brazilian companies have been similarly active), "flex crops" are primarily sugarcane and soybean. (Oil palm is the main example in south-east Asia);

4. Others indicate an intention to establish multi-use projects. Those involved are a mixed group and their motivations are quite possibly primarily speculative.

If all of the African land deals in the LandPortal database were developed for agricultural production, an estimated 4.8% of agricultural land in the continent would be affected (Anseeuw et al. 2012).

Although arguing for increased large-scale commercial investment in African agriculture, Collier and Dercon 2009 are careful to distance themselves from most of these investments, which they describe as "fundamentally geopolitical rather than commercial and … not an appropriate vehicle for encouraging growth in African societies" (p1). Allocation sizes of upwards of 100,000 ha are not uncommon, although these are not linked to commitments to build dedicated handling or port infrastructure in the way that the "superfarms" described by Deininger and Byerlee 2012 are. There are promises of plentiful local employment on the new farms, which suggests quite labour-intensive production, but then large-scale operations will face major challenges of labour motivation and supervision. Especially where food production is contemplated, this suggests that greater efficiency would be achieved by providing reliable marketing outlets to smallholders (but see below). Lease terms (often 99 years) are far longer than would be required for security of commercial investment. Collier and Dercon 2009 also observe that, if an enterprise of anything like this size did get started in an area, it would almost immediately exercise monopsonistic power in local factor markets. A particular concern relates to proposed investments in jatropha[17], as the basic agronomic work has not yet been completed to permit profitable commercial exploitation (Steve Wiggins, pers.comm.). Perhaps not surprisingly, many of these supposed investments have been slow to get started. However, a good number of investments in "flex crops" - serious commercial deals, of the sort sought by Collier and Dercon 2009 – have started (Anseeuw et al. 2012).

It seems likely that such large-scale land deals are encouraged by a narrative of "under-utilised" (or worse "unutilised" or idle) land. This term is used by World Bank 2009 to describe the so-called guinea savannah area of Africa – a vast swathe (one third of Africa's land) stretching from Senegal across to Sudan and western Ethiopia, then down to Mozambique, Malawi, Zambia and Angola. Perhaps a more helpful term would be "land with low cropping intensity" (Jim Sumberg), as there is plentiful and growing evidence[18] of multiple other uses (for example, for grazing and for harvesting of wild resources, especially important to the poor and in bad years)[19]. Much of the land also has high biodiversity value (Future Agricultures Consortium 2010; Dessalegn Ramato 2011). Unfortunately, neither many of the direct uses (Cavendish 1999) nor the value of additional environmental services are captured in official statistics, so may not be appreciated by policy makers. As these land deals have rarely been preceded by adequate local consultation (Vermeulen and Cotula 2010; Alden Wily 2011; Dessalegn Ramato 2011), such value continues to be disregarded. Based on field work in two of the regions of Ethiopia where large-scale land allocations have been granted, Dessalegn Ramato 2011 suggests that the number of existing livelihoods adversely affected by the arrival of the projects outweighs the number of people who will secure employment at the projects in the foreseeable future (and the winners and losers will not necessarily be the same people).

Deininger and Byerlee 2012 suggest that investors have sought countries with weak governance, including property rights regimes, in which to acquire land. If so, this may be a short-sighted strategy, as the costs of having to continually defend such land rights over time can reduce the competitiveness of large-scale agricultural investment in Africa (Poulton et al. 2008).

From the other side, what are the motives of the states granting land? These can only be imperfectly discerned, as there can be both formal public justifications and hidden private incentives (rent-seeking opportunities) for individual decision makers. Both Alden Wily 2011 and Dessalegn Ramato 2011 emphasise that, insofar as there has been a land "grab" going on, it has firstly been a seizure of land by the state (which exercises the authority to grant leases) from those previously using it under communal tenure arrangements.

In the Ethiopian case, Dessalegn Ramato 2011 describes a pro-active approach by the government to attracting agricultural investment, in particular from India[20] and the Middle East. These efforts were underway by 2007, i.e. prior to the food price crisis, after the perceived success of Ethiopia's initial foray into large-scale horticulture earlier in the decade. The terms of the leases, including tax rates favouring export-oriented production and extremely low rental rates, suggest that generation of foreign exchange was a major objective for the government. The government insists that the courting of large-scale investment is complementary to its efforts to increase the productivity of smallholder agriculture and not a substitute for it. However, the scale of future land deals envisaged in the 2010-15 Growth and Transformation Plan suggests, at the very least, that smallholder agriculture is not seen as an adequate basis for the very rapid economic growth now targeted by the government. Meanwhile, Dessalegn Ramato 2011's observations on the local livelihood impacts of the new investments raise two possibilities. The first is that the federal government has mistakenly believed that the land is virtually "unutilised" and that allocations to large-scale investors have almost zero opportunity cost. The weak feedback mechanisms within Ethiopia's top-down state-party system could plausibly mean that important local knowledge to the contrary is not fed back to the top. If so, when the reality on the ground is realised, expect the government to scale back the size and perhaps also number of future allocations. Secondly, and more scarily, the government does know the local cost of such deals, but now – especially after its entrenchment of state institutions throughout the country (see earlier discussion of agricultural extension) and the overwhelming (though not free and fair!) 2010 election victory - feels secure enough to pursue a growth strategy that imposes costs on "peripheral" regions of the country whilst generating benefits (macroeconomic growth, foreign exchange etc) primarily for the centre.

Two other countries within Future Agricultures Consortium's PEAPA study have also featured prominently in the recent wave of land acquisitions: Tanzania and Mozambique. Interestingly, both countries have

significant unrealised agricultural potential, but have achieved high rates of macroeconomic growth in recent years through economic diversification (principally minerals and tourism). Official figures show almost no progress in tackling high rates of rural poverty in either country over the past decade despite these high rates of macroeconomic growth. In Tanzania President Kikwete seems aware of this and has been looking to get something happening in agriculture. In addition to ongoing donor projects, he has invited Gatsby Charitable Foundation to try and revitalise the cotton sector, publicly championed the Kilimo Kwanza campaign (an initiative with support from commercial interests aligned to his CCM party) prior to the 2010 election, and has also championed the Southern Agricultural Growth Corridor of Tanzania (SAGCOT, which extends an invitation to international agribusiness to invest in the major maize producing region of the country)[21]. These initiatives should be seen in the context of the extremely limited capacity of existing state agencies to deliver anything in the way of agricultural development. According to Therkildsen 2011 and Cooksey 2012, the effectiveness of the central state apparatus is crippled by its limited control over local administrations, which may be demanding an increasing share of rents from development initiatives in exchange for their role in bringing votes in for CCM at election time (a perverse impact of democratisation!). These authors also note internal debates within CCM about future strategy: can it retain power through "business as normal" or does it have to start delivering more to the rural electorate in particular? If the latter, might new actors, including the private sector players associated with SAGCOT, be able to get something moving outside the normal constraints of the government system?

In Mozambique since the mid-1990s the government has selectively provided policy backing to private sector agricultural investments, leading to close relationships between agribusiness and the ruling party. Policy support for investment to rehabilitate the sugar sector has enabled the creation of new jobs and hence political support for the government in previously opposition-controlled areas (Buur et al. 2012). However, in stark contrast, the state has invested very little in trying to develop semi-subsistence food production, where private investment has not been forthcoming. A striking feature of agricultural under-performance in the country is that smallholder households operate very modest land areas, typically relying on hand hoe cultivation, despite vast areas of high potential land not being cultivated. A first step to changing this could be promotion of animal traction, but this may be impeded by tsetse infestation across some of the best land in the country. Tsetse eradication (as in Gokwe in Zimbabwe in the 1970s and 1980s) would presumably be a 10-20 year project – expensive and well beyond an electoral cycle. However, the government has tended to see smallholder agriculture as performing primarily a social protection role, rather than as being a potential growth driver. As in Tanzania, there are now debates within Frelimo as to whether it needs to provide more support to smallholder agriculture, so as to maintain its legitimacy and support in the countryside in future (Carlos Castel-Branco, pers. comm.). However, if the group arguing for this do not prevail, then the arrival of large farms[22] could represent an acceleration of a modernisation agenda that by-passes smallholders, creating significant rural inequality and quite possibly holding back the rate of rural poverty reduction.

Future trajectories

It is still too early to say with confidence what impact the recent wave of large-scale land acquisitions will have on African agriculture. There has clearly been plenty of speculation and opportunism, so it remains to be seen how many projects will actually go ahead, which crops they will grow and how much of their land they are able to use. (What will come of the land allocations formally acquired for jatropha, for example?) If many projects do not go ahead or only use a fraction of their land, there may be some scaling back of future allocations (a partial reasserting of control, plus lesson learning, by technocrats?). Some projects may also start, then fail; there have been plenty of unsuccessful large-scale agricultural projects in Africa in the past (Tyler 2007). Given this rather pessimistic view, it seems unlikely that the allocations to date will lead to any transformation of African agriculture. Aside from jatropha (where projects seem unlikely to proceed) and the "flex" crops, the areas allocated are small relative to existing production areas for the same crops in the continent. However, the allocations are heavily concentrated in a modest number of countries and there are nine countries (including Mozambique and Ethiopia) where total allocations reported in the LandPortal database exceed 20% of the size of existing cropped area in the country. Thus, if even half of the land did end up cultivated, it would make a noticeable difference to total national production.

As already noted, there will be livelihood costs to these projects, as well as benefits. These costs will be greatest if large allocations are used extensively (but not intensively) so as to preserve the property rights that have been gained, thereby denying local people their existing use rights.

Conclusions

This paper has endorsed the widely held view of the historic under-performance of African agriculture, whilst noting that there has been considerable variation in performance both across and within countries and regions in all recent decades. As a central reason for this, it has identified the lack of effective support for agricultural development from many states, starting with the high levels of taxation highlighted by Bates 1981 and continuing with lack of investment in key public goods even once this taxation was largely removed. The 2003 Maputo Declaration by African heads of state has yet to lead to any step-change in investment, and it does not appear that the CAADP process has made a significant difference to the quality of agricultural policy making in

the continent (although findings on this are still highly preliminary). The paper has rooted these shortcomings in the weak political incentives for investment in public goods necessary to support smallholder intensification and commercialisation. Governments can retain power without delivering on these investments – and this situation has not yet been changed by democratisation.

As populations continue to rise rapidly around the continent, population densities in some rural areas are reaching levels that are threatening to undermine agricultural productivity and welfare. One would expect such trends to trigger public investment, either to support land productivity or to resettle some of those concerned, but this response has not yet been forthcoming.

At the same time, in some countries, there has been significant commercial interest in land with low cropping intensity, driven by increasing global food prices and demand for biofuels. Much of this investment has been speculative or opportunistic, so it is not clear what its overall impact will be yet. However, whilst there may be noticeable production impacts in a small number of countries, it is clear that there are already negative livelihood impacts, as existing users are deprived of their use rights under customary tenure systems. This experience raises the question as to what role investment in large-scale farms could or should play in future agricultural development of the continent.

The paper reviewed evidence that smallholders could grow many (but not all) crops as efficiently as, or more efficiently than, large-scale farms in the low wage settings typical in Africa. Some commodities are also suited to contract farming arrangements, where the labour advantages of smallholders in production are combined with the access to finance, information and markets of agribusiness. Where the political incentives exist to invest in support services for smallholder farmers, the dividends in terms of poverty reduction can be high, as seen in Rwanda in the past few years. However, these incentives are precisely what have been lacking in many countries.

Encouraging establishment of large farms can then seem an easier option for promoting rural development and indeed pioneering large investments may help justify the infrastructure costs of opening up news areas and provide a locus for services to smallholder outgrowers (Hayami et al. 1990; World Bank 2009). However, as recent experience shows, establishment of large farms can also come at a cost, especially if the interests of existing residents of an area are not taken into account in the planning. Deininger and Byerlee 2012 conclude that, "if the recent trend of growing interest in large scale corporate agriculture in Africa is to be sustained and bring about positive development outcomes, improvements in land governance and transparency are essential" (p705). The problem with this is that improved governance is not something that is just decided upon! Better governance is the outcome either of the realisation on the part of those with power that they need to exercise it more responsibly, because they will face consequences if they don't, or of actions by citizens to demand more responsible performance. Conversely, in rural development, poor governance stems from the same root as lack of investment to support smallholder farmers: weak political incentives. If senior members of a government are convinced that they have to perform on something to survive, they will find mechanisms to ensure that delivery is not completely undermined by corruption, distributional or other issues.

The conditions for large scale agriculture to bring about positive development outcomes may thus be restated as follows:

1. Clear political commitment to broad-based rural development (the state knows that it has to deliver), such that consultation does happen, complementary investments are undertaken to link smallholders to whatever commercial investment occurs etc

2. The existence of land with low cultivation intensity, so that benefits from new investment are not outweighed by costs to existing users

3. Some constraint to the adoption of a smallholder model, otherwise why not invest in smallholders directly? Possible constraints could include: (at national level) low state capacity to deliver the smallholder model[23] or lack of available labour for a pure smallholder model in the area concerned; (if considering a particular sector) competitive disadvantage of the smallholder model in that sector (e.g. export horticulture).

It is hard to think of any clear-cut cases where all three conditions hold in Africa.

Unfortunately, if the first condition does not hold, then 2+3 (at national level) are likely to lead to an inequitable outcome. This may still contribute to national growth objectives and nudge the country towards its poverty reduction targets (but more slowly than if a smallholder model had been possible). However, one lesson from Latin America (de Ferranti et al. 2003; Justino and Acharya 2003) as well as from South Africa, Zimbabwe and Kenya – countries with long-standing large-farm sectors – is that rural inequality tends to reproduce and replicate itself. It is then extremely hard to reverse – possibly even more difficult than eradicating extreme poverty?

END NOTES

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1 In this paper, Africa is generally used as short-hand for Sub-Saharan Africa.

2 Their calculations are based on data for 13 countries in Sub-Saharan Africa: Botswana, Burkina Faso, Cameroon, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Malawi, Mali, Nigeria, Togo, Uganda and Zambia.

3 Due to time and space constraints, it does not consider the impact of climate change, although

this will undoubtedly exert a huge influence on African agriculture in coming decades. Basic position: ceteris paribus, generally higher temperatures and more erratic rainfall will reduce the rate of growth of African agriculture and hence its contribution to poverty reduction. This makes it more urgent that African governments, supported by international efforts, invest in research to develop production systems and crop varieties suited to the evolving conditions, in irrigation infrastructure (where appropriate), and in encouraging the various support services (technical advice, finance, input supply) that farm households need to adapt to changing conditions. If carbon markets develop that, due to fixed costs of certification and assurance, are only readily accessed by large farm enterprises, then it may also (modestly?) shift the competitive balance away from smallholder producers and towards larger farms. However, this possibility is not explored further in this paper.

[4] Early work on this topic included Pingali et al. 1987. A 1990s report reaching the same conclusion for northern Ghana, where repeated efforts have been made to promote use of tractors, is PAB Consult and COWI Consult 1996. More recent evidence is considered below.

[5] This drew heavily on the experience of Geoff Tyler as an investment manager for the then Commonwealth Development Corporation. Case studies of individual commodities can be downloaded from http://go.worldbank.org/XSRUM2ZXM0.

[6] Use of herbicides, with herbicide-resistant crop varieties, could also be attractive.

[7] All these figures include North Africa, where yields are higher than in Sub-Saharan Africa and have also been rising rapidly over time. The 2008-10 figures include a dramatic jump in reported yields for Southern Africa.

[8] This should not be read as saying that quantity of investment alone is what counts: some investments are likely to give much greater returns than others (in general, investments in public goods will give higher returns than transfers, albeit perhaps over a longer time horizon) and investments should be made within a coherent and supportive overall policy framework. However, quantity of investment is one element of the story – a necessary, but not sufficient, condition for growth.

[9] Exports of live animals from the Horn of Africa to Middle Eastern markets are an exception to this (Hazell 2007). Geographical proximity helps to overcome high domestic transportation and marketing costs in this case.

[10] Whilst many African cities are growing rapidly, Potts 2012 examines data for 18 African countries and shows that the share of the total population living in urban areas has only increased on average by around one percentage point per decade since the early 1990s. This is much less than was previously acknowledged.

[11] It is interesting to note that these "emerging" commercial farmers did not "emerge" from the ranks of the country's smallholders - at least, not directly (Poulton et al. 2008). Moreover, whilst information on such farmers remains limited, the author does not know of any country in Africa where they could be described as being a major part of the agricultural system.

[12] Possible exceptions to this, unfortunately, involve a crisis first, then an ex-post policy response. The next section briefly discusses the political economy of agricultural policy in Rwanda in terms, inter alia, of the incentives to avoid future conflict. There are authors who see the country's very high population density and hence intense pressure on land and natural resources as contributing to the 1994 genocide (André and Platteau 1996). In Kenya, Rift Valley province, which was at the centre of election time violence in 1992, 1997 and 2007-08, is the most heavily populated province in the country, containing a quarter of the entire Kenyan rural population. It also has the highest degree of inequality in land holding in the country – comparable to Latin America levels (World Bank 2008). However, so far conflict in this province has not triggered greater attention to pro-poor rural development in the country.

[13] This section draws heavily on Poulton 2012. Whilst democratisation encompasses a range of measures designed to make leaders more accountable and responsive to citizens, the discussion here is centred on the introduction of competitive elections for national political office, which is one important component of this.

[14] Current elections may be fair and indeed competitive, but with clear restrictions on the nature of competition (e.g. no ethnically-based appeals) and, therefore, on who can contest

[15] Another element of the government's strategy is to discourage reference to ethnicity within the country, stressing instead the common heritage of all Rwandans.

[16] Note that the "median" voter in much of Latin America is urban and poor, so many such movements were urban. However, Brazil's landless workers' movement MST is an example of a movement that campaigns for the interests of rural poor groups and seeks to raise political awareness amongst them.

[17] The LandPortal database records over 100 land deals supposedly for jatropha production, totalling over 8.6 million hectares, across 16 countries (http://landportal.info/landmatrix).

[18] A large number of case studies of local impacts of land deals and the processes leading to their

conclusion can be found at www.future-agricultures.org/events/global-land-grabbing.

19 A relatively small part of the guinea savannah zone – around northern Nigeria and southern Burkina Faso – is already quite heavily populated and hence intensively used for agricultural production (Future Agricultures Consortium 2010).

20 To the current author, this seems a deliberate strategy to counter-balance the influence of China over the Ethiopian government. Chinese assistance had previously been sought for infrastructure development in the country, but also as a useful counterweight to conventional donors.

21 However, the President inviting or publicly championing a project does not necessarily imply full, high level political support for it. The efforts to revitalise the cotton sector were held back for some time by personal opposition from the Minister of Agriculture.

22 The LandPortal database lists 86 transnational agricultural projects for Mozambique.

23 Tanzania could possibly be an example here. However, note that this should only be a temporary problem, because, if the state knows that it has to deliver, then its top leadership should in due course be able to do something about the state's delivery capacity. Ethiopia could possibly provide another example: the state already spends heavily on rural development, so efforts to grow more rapidly have to draw on other sources of investment, e.g. the private sector.

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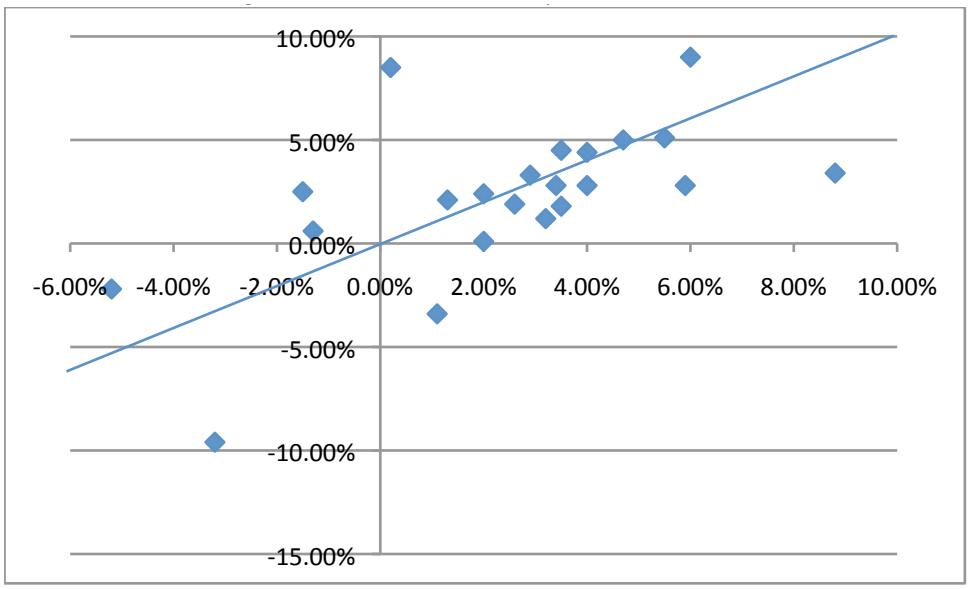
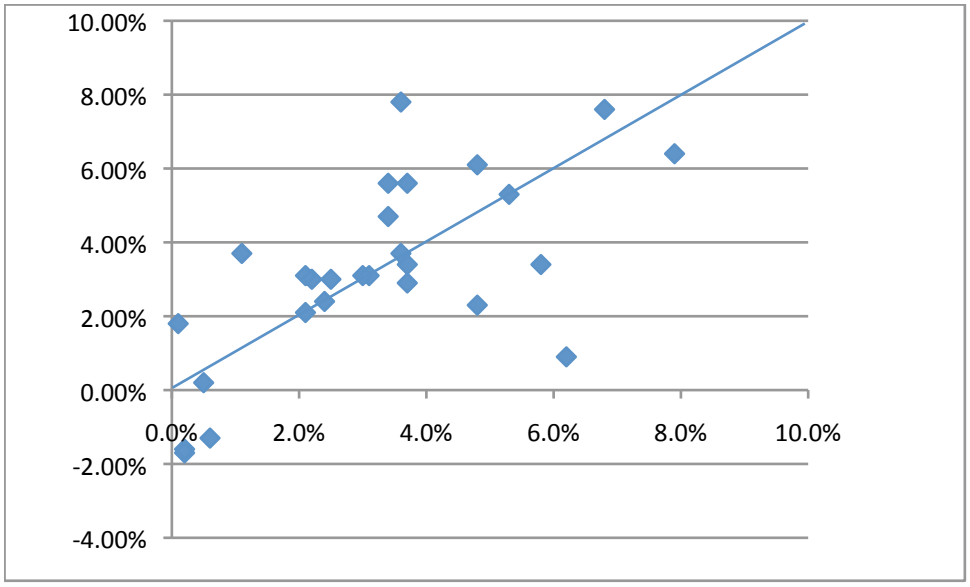
Appendix 1: FAO vs World Bank data on agricultural production growth

A: Growth rate of agricultural production (% p.a.), 2002/04--2008/10



X-axis = Agriculture: Gross Production Value (constant 2004-2006 million SLC) (source = FAO)
Y-axis = Agriculture, value added (constant LCU) (source = World Bank)
For the period 2002/04-2008/10 there are 22 African countries with data in both sources

B: Growth rate of agricultural production (% p.a.), 1992/94--2002/04



X-axis = Agriculture: Gross Production Value (constant 2004-2006 million SLC) (source = FAO)
Y-axis = Agriculture, value added (constant LCU) (source = World Bank)
For the period 1992/94-2002/04 there are 27 African countries with data in both sources

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