



Agricultural Policy Research in Africa



WHAT IS AGRICULTURAL COMMERCIALISATION, WHY IS IT IMPORTANT, AND HOW DO WE MEASURE IT?

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1. INTRODUCTION

Agricultural commercialisation occurs when agricultural enterprises and/or the agricultural sector as a whole rely increasingly on the market for the sale of produce and for the acquisition of production inputs, including labour. It is an integral and critical part of the process of structural transformation (see section 1.1), through which a growing economy transitions, over a period of several decades or more:

- **from one where the majority of the population live in rural areas and depend directly or indirectly on semi-subsistence agriculture for an important part of their livelihood**
- **to one where the majority of the population live in urban areas and depend on employment in manufacturing or service industries for the major part of their livelihood.**
- **increasing foreign exchange earnings through sale of export commodities, thereby facilitating acquisition of imported capital equipment for manufacturing**
- **providing a source of tax revenue for public investment, although too much taxation is likely to choke the process of agricultural commercialisation**
- **releasing labour for employment in other sectors of the economy, insofar as commercialisation is associated with rising labour productivity in agricultural production.**

As such, agricultural commercialisation is an endogenous process that interacts with developments in other sectors of the economy and whose impacts depend critically on conditions in those other sectors. It proceeds via the decisions of numerous private agents – farmers, input suppliers, traders and processors. However, these can also be influenced by purposive investments by public and social actors (states, donors, non-governmental organisations (NGOs), foundations). For analytical purposes, these investments can be considered as exogenous initiatives to promote commercialisation.

Agricultural commercialisation is encouraged by growing demand both for agricultural products (food, raw materials supplies for agro-industries) and for workers within growing urban centres. However, agricultural commercialisation can also contribute to the process of structural transformation in the wider economy by:

- **increasing the supplies of food that are marketed for consumption by urban consumers, thereby keeping prices down (making wage labour in manufacturing and service industries more competitive) or reducing reliance on imports (economising on scarce foreign exchange)**

Our definition of agricultural commercialisation encompasses two contrasting commercialisation dynamics. The first of these occurs when smallholder farm households shift from semi-subsistence agriculture to production primarily for the market – in the process coming to rely increasingly on purchased inputs and perhaps also labour in their production. However, their scale of production remains small, due primarily to high demand for land among people who have yet to obtain more remunerative and reasonably secure employment in the non-farm economy. The second dynamic occurs when smallholder farm households are complemented or replaced by medium- or large-scale farm enterprises that are predominantly or purely commercial in nature. Ultimately, as the structural transformation proceeds, this second dynamic will be observed as the natural outcome of market forces, unless social and political resistance seeks to preserve a class of small (primarily part-time) farmers through a regime of subsidies. However, larger farm enterprises may also be established earlier in the process of structural transformation, as people with capital and/or political connections use these to gain access to high-potential land. Such enterprises can contribute to the process of structural transformation in all the ways listed above. However, the distributional consequences of this second type of agricultural commercialisation during the early stages of the structural transformation can be expected to be different from (and generally less benign than) the impacts of the first.

In this paper we draw on existing literature to consider these different types of agricultural commercialisation.

For each, we consider the conditions in other sectors of the economy and polity that stimulate agricultural commercialisation and mediate its impacts, as well as public policy actions that might encourage commercialisation, its potential benefits, and the likely configuration of winners and losers. We observe that both the dynamics and the impacts of agricultural commercialisation differ according to whether the commercialisation in question occurs early or late within the process of structural transformation or, more specifically, before or after the so-called ‘Lewis turning point’ (see section 1.1). We also observe that the impacts depend on whether the commercialisation in question occurs in areas of low or high population density.¹ The final section of the report discusses the measurement of agricultural commercialisation in the light of this review.

The paper begins, however, with a brief discussion of the process of structural transformation within an economy, followed by consideration of semi-subsistence farm households, as these are the starting point from which agricultural commercialisation proceeds.

1.1 The structural transformation

The structural transformation refers to the historic shift in the balance of economic activity and labour input as a growing economy transitions from one where the majority of the population live in rural areas and depend directly or indirectly on semi-subsistence agriculture for an important part of their livelihood, to one where the majority of the population live in urban areas and depend on employment in manufacturing or service industries for the major part of their livelihood.²

As conceived by Lewis (1954), a dynamic industrial sector gradually draws surplus labour out of semi-subsistence agriculture, which performs a social protection role as well as a productive one in the absence of other sources of economic activity. Productivity growth in agriculture is valuable for staving off food crises, but rural wages only rise slowly while there remains surplus labour in rural areas. However, a turning point is reached when the quantity of additional labour demanded by the growing manufacturing/urban sector exceeds the increase in population due to population growth, and the rural population begins to fall. At this point – which we refer to in this paper as the ‘Lewis turning point’ – the segmented rural and urban labour markets rapidly integrate, and rural wages begin to rise sharply to more closely approximate urban wages. This has profound effects on agrarian structure and the nature of agricultural production.

This paper argues that a movement of labour out of semi-subsistence agriculture is an inevitable part of the economic development process. This is because a preponderance of labour in rural areas restricts the average size of farm holding, and a smallholder farm of 1–2 hectares simply cannot generate medium, let alone high, incomes for the members of the smallholder farm household. To the extent that governments are willing to subsidise smallholder farm incomes through public transfers, then some smallholdings can remain. Some continue to exist as part-time or ‘hobby’ farms. However, as both contributor to and consequence of rising average incomes in an economy, many poor people leave rural areas and their agriculture-related livelihoods to seek employment in urban areas. Once the Lewis turning point has been passed, this permits consolidation of landholdings and rising incomes per person for those who remain in agriculture.

Nevertheless, multiple possible trajectories for the structural transformation are possible and there may be twists and reversals within these. As classically conceived, it is the growth of manufacturing that drives the expansion of the urban economy (Mellor 1986; Lewis 1954). However, recent literature (Gollin et al. 2013; Jedwab 2013) argues that some forms of agricultural commercialisation may stimulate urbanisation *without* encouraging increased production of tradable manufacturing and services products. They use the term ‘consumption cities’ to describe urban areas where the available employment is predominantly in non-tradable service sectors. Gollin et al. (2013) argue that economies dominated by consumption cities will grow more slowly than economies with dynamic industrial sectors, and they characterise the rise of consumption cities as ‘urbanisation without structural transformation’.³ An alternative interpretation of the same phenomenon is that this is a different trajectory for the structural transformation from that envisaged by Lewis (1954) – one that is most likely to be observed in countries with an abundant endowment of natural resources, although policy also has an important role to play in shaping the trajectory. If Gollin et al. (2013) are right about the slower aggregate growth rate, then the rate at which structural transformation (i.e. the shift of labour out of semi-subsistence agriculture) proceeds will also be slower.

Another critical aspect of the structural transformation process is the mechanism by which labour is moved out of semi-subsistence agriculture. Lewis (1954) envisaged a demand pull from a dynamic industrial sector. However, in some countries – for example, in Latin America and southern Africa – smallholder farm households have been forcibly displaced from their land by large, settler farms. These and other policies

that have the effect of limiting the viability of agriculture-based livelihoods thereby push labour towards urban areas. Lack of opportunity in rural areas depresses the wages that migrants are willing to accept in urban areas, hence generating a supply of cheap labour for manufacturing and service industries. Where land is more plentiful and the rate of labour absorption in urban areas is modest, smallholder and large-scale farms may co-exist for decades or even centuries.

Timmer (2009) emphasises that different trajectories for the structural transformation have very different outcomes in terms of inequality. Balanced growth – which combines public investment in support of smallholder agriculture with promotion of labour-intensive industrialisation – generates the most equitable

outcomes throughout the structural transformation. By contrast, promotion of capital-intensive industries reduces the rate of labour absorption per unit of manufacturing output and increases inequality between the owners of capital and those in manufacturing employment on the one hand and those in other sectors of the economy, including agriculture, on the other. Policies that limit the viability of smallholder agriculture-based livelihoods exacerbate inequality between urban and rural areas, but this inequality is also likely to be perpetuated *within* urban areas over time as vulnerable migrants are pushed towards urban areas with minimal reservation positions in any wage bargaining. Such inequalities, once established, may perpetuate themselves for generations.

2. SEMI-SUBSISTENCE FARM HOUSEHOLDS

At the start of the structural transformation, the majority of rural households have some entitlement to land and depend to a greater or lesser extent on agricultural production for their livelihoods. Under traditional tenure systems in Africa, most households have their own use rights to parcels of land – i.e. there are few landless households dependent entirely on rental for their access to land. However, access to land is far from equal and, as population densities rise in particular countries and in regions within countries, the landholdings of the poorest households are becoming increasingly inadequate to support even the most basic standard of living (Jayne et al. 2014; 2003). These tensions notwithstanding, rural areas continue to act as a reservoir for people without employment in the formal economy (Timmer 2009). Although some urban areas are growing rapidly, the rate of overall population growth means that rural populations continue to rise. In the absence of employment opportunities in the formal economy, access to land and common property resources (e.g. water resources, grazing lands, woodlands, wild foods) provides some basis for subsistence, even if income and consumption flows from such resources have to be supplemented by earnings from other activities (Ellis 2000; Scoones 1998; Reardon 1997). Local kinship networks provide a degree of informal social protection, increasingly supplemented by resource flows from family members who have migrated (on a short- or long-term basis) to other areas, both rural and urban (Jayne et al. 2014).

Under these conditions, agricultural production tends to be semi-subsistence. Within particular regions or districts, many households produce similar combinations of crops, limiting the potential for intra-local trade (Binswanger and McIntire 1987; Binswanger and Rosenzweig 1986), although those with above-average resource endowments may sell surplus production to deficit households. At the start of the structural transformation, urban demand is limited by the size of urban populations as well as by distance and the poor quality of infrastructure, which reduce the profitability of trade. While export supply chains exist for some commodities, the number of such chains is limited by low farm productivity and the poor quality of infrastructure, which reduce competitiveness in

international markets. Poulton et al. (2008) found that African countries have achieved agricultural export competitiveness primarily in medium- to high-value crops either where competition is limited by agro-ecological conditions (e.g. cocoa, tea) or where the labour intensity of production enables African producers to exploit low-cost labour (family or hired) to offset the competitive disadvantages from factors such as high transport costs (e.g. cotton, horticulture). Perhaps not surprisingly, the volume of such exports grows only slowly (Diao et al. 2003); faster-growing markets are likely to attract research and investment from more potential competitors.

Semi-subsistence households devote a portion (often the majority) of their land to relatively low-value crops that they consume themselves. The alternative – to produce higher-value crops for sale, then use the income generated to buy food crops for home consumption – is rendered unattractive by two factors:

- **The high transport and/or transaction costs associated with both selling and buying crops, such that the benefits of producing higher-value crops are wiped out by the high costs of trading (Jayne 1994).**
- **The volatility of food prices across and within seasons, such that farmers fear encountering high prices for staple foods when the time comes for them to buy them (Fafchamps 1992).**

Both of these factors point to the importance of increasing the efficiency, including stability, of food markets in any strategy to promote agricultural commercialisation. Very poor households who are heavily reliant on their own production for their food needs, especially under unpredictable rainfed conditions, tend to favour a diversity of locally adapted, often somewhat drought tolerant, crop varieties. These, however, are often also inherently low yielding.

Meanwhile, production of low-value commodities on small parcels of land generates small, often negligible, surpluses that make it difficult for the household to cover the basic cash requirements for daily living, even when supplemented by non-farm earnings. Some crop sales

by poor semi-subsistence households are, therefore, not sales of surplus, but so-called 'distress' sales to meet immediate cash needs, even if the household then has to buy in quantities of the same crop a few months later, when prices are higher.

Under these conditions, there are few cash resources available to invest in agricultural production (improved seeds, fertilisers, crop protection chemicals, animal traction, irrigation technology, etc.), so productivity remains low. Unpredictable rainfed conditions also increase the risk of investing in cash inputs, so may discourage intensification, especially when cash is very scarce.

What many (though not all) poor households do have is available family labour. Labour is likely to be 'abundant' (read 'under-utilised') where plot sizes are small due to high population densities, and where opportunities for off-farm employment are limited. At the start of the structural transformation, employment opportunities in urban areas are limited, while opportunities within the rural non-farm economy are restricted by the

low demand for non-farm goods and services from poor agricultural households (Haggblade et al. 2007; Reardon 1997).

Hence, many semi-subsistence households make intensive use of family labour on their farms, often applying it beyond the point at which its marginal productivity equals the prevailing casual wage rate. Some do also hire in labour at times of peak demand, but this labour is more likely to be employed such that marginal productivity equals the prevailing casual wage rate. The willingness of family labour to 'self-exploit' in the absence of alternative productive opportunities, combined with the low monitoring costs associated with family labour in household fields, means that smallholder households can still compete with more sophisticated and capital-intensive commercial farms in some agricultural output markets, despite their disadvantageous position with respect to both capital and information (Poulton et al. 2010; Binswanger and Rosenzweig 1986). Where competitiveness is achieved through self-exploitation, however, it is almost by definition not associated with affluence.

3. SMALLHOLDER COMMERCIALISATION

As urban populations grow, demand for marketed agricultural products increases. Infrastructure investment – also associated with the structural transformation – reduces the costs of transporting agricultural produce from rural to urban areas, encouraging smallholder farmers to increase their marketed output in response to this increased demand, often perhaps in competition with imports. The World Bank (Byerlee et al. 2013) estimates that Africa’s total domestic demand for food is just over \$300bn per year and this figure is expected to triple by 2030. If urban areas now account for around 40 percent of Africa’s population (World Development Indicators 2017), then this equates to perhaps \$150bn of food consumption per year. By contrast, agricultural exports are worth around \$60bn per year (Ibid.), some of which feed urban populations in neighbouring African countries.

Rising demand for final products also encourages commercial private investments in agricultural supply chains, from input supply through petty trading to processing, all of which may facilitate commercialisation by smallholder producers (Byerlee et al. 2013). For example, firms with processing capacity may support nearby smallholders to produce the varieties and qualities of the crops that they want, through input credit and/or extension advice, as well as simply creating additional local demand for those crops.

Purposive public and social investments can also seek to facilitate agricultural commercialisation at the local level by, for example:

- **enhancing the information that smallholder households have regarding market opportunities, prices for different crops, etc.**
- **facilitating linkages between smallholders and buyers**
- **organising smallholders into groups or cooperatives and training them to target new market outlets**
- **providing finance to fund upgrading investments that enable smallholders to meet requirements of particular market channels**

- **organising certification schemes where required**
- **supporting the expansion of input supply networks by providing business training or credit guarantees for emerging entrepreneurs and introducing them to distributors**
- **pursuing policies (at the national level) to ensure greater stability in staple food prices.**

Some of these investments will combine initiatives to link smallholders to new and/or remunerative marketing channels with initiatives to raise farmer productivity in response to these expanded opportunities. These might encompass:

- **access to new technologies such as improved seed varieties, fertilisers, improved methods for crop protection, technologies for storage or primary processing. Initiatives to enhance access may include exposure through demonstrations, etc. and credit schemes to facilitate uptake.**
- **provision of technical knowledge to raise yields to remunerative levels, manage pests or drought, etc. as well as how to meet the quality and other requirements of new market channels.**

Of course, not all initiatives to promote commercialisation will be successful. Consistent with our opening definition, commercialisation occurs where *either*:

- **a household increases its total agricultural production and most of the incremental production is marketed, such that the share of its total output that is marketed rises⁴**
- **a household increases its production of crops that are marketed and makes space for this – given land or labour constraints – by reducing the land or labour that it devotes to food production for own consumption. This is a more significant change than the previous situation, in so far as it implies a greater reliance on markets for food purchase. It may indicate that there has been a systemic improvement in the functioning of food markets over time, which is good for**

agricultural commercialisation. Of 11 studies analysed by von Braun and Kennedy (1994), only in two did food production for home consumption decline when market-oriented production increased.⁵ In the four central Tanzanian villages studied by Mutabazi et al. (2013), however, more commercialised households devoted less land to cereals production for home consumption, relying on food purchases from neighbouring farmers with surpluses to spare.

Note that initiatives that lead households to expand production of one cash crop at the expense of another do not constitute commercialisation; this just entails switching between cash crops as opportunities change. A medium-term perspective (5+ years) may be necessary to observe that one cash crop has declined, for whatever reason, and then been replaced with a lag by another one.

Similarly, not all initiatives to promote agricultural commercialisation prove to be sustainable. Marketed output may rise during the time that a project actively facilitates production and/or links to market, but decline again once this support is withdrawn.

3.1 Who participates in early smallholder commercialisation?

This is an important question for APRA's research; the nature of agricultural commercialisation, alongside the existing literature, suggest some starting hypotheses. On balance, one would expect households that live closer to urban centres to commercialise more quickly than those that live further away. Proximity to the market increases access to information and perhaps the ability to establish linkages with particular buyers. Lower transport costs increase the benefits from sale to market, while food prices may also be more stable than in remoter areas. (Large urban centres tend to be supplied from multiple production zones, which spreads risk.) Competition for land is higher closer to urban centres and land rights may be more individualised (Platteau 1996). This may encourage those with land to either increase the returns that they realise from it or to sell or rent it to others.

However, the nature of the crop is an important mediating factor here. It is common to find high-return but perishable crops such as various horticultural products grown in peri-urban areas. However, other crops grown primarily for market may require more land or particular agro-ecological conditions and this will affect overall patterns of commercialisation. In central Ghana, Nin-Pratt and McBride (2014) find that the

locus of cocoa production has gradually shifted to less densely populated areas, while closer to major urban centres cassava is one of the major crops. Much of this cassava is grown for own consumption on small plots by households who value the high returns that it gives to both land and labour, not least because their major livelihood activities (hence labour use) are within the urban economy. By contrast, in northern Ghana, yam production (one of the main crops grown predominantly for market) is practised in areas of medium-to-low population density, as soil fertility remains high in these areas (while some crop rotation and fallowing remain possible) and labour costs are cheap (Ibid.).

The study of onion production villages in central Tanzania by Mutabazi et al. (2013) shows that exceptions to many rules are possible. These villages are 170–240km from Morogoro and 350–420km from Dar es Salaam. They have developed as centres of onion production due to local irrigation investment and through networks of Pemban diaspora. Consistent with expectations, however, Mutabazi et al. found that commercialisation levels were higher in the two villages with better connections to the main highway to Morogoro and Dar es Salaam.

Our starting assumption is also that wealthier households are likely to commercialise ahead of poorer households. This is neatly captured in the notion of 'three rural worlds' (Vorley 2002), whereby it is the minority of farmers in 'rural world 1' who readily accommodate themselves to the changing dynamics of agricultural markets and value chains. There are at least three reasons why better-off African smallholders might be able to raise the proportion of their output that they sell to market more readily than their poorer neighbours:

- **They have more land (per household member), so can satisfy their subsistence food needs and still devote some land to production for market. This 'both-and' approach is sensible where food markets remain volatile. By contrast, if households with small landholdings wish to commercialise, they either have to rely on food markets for their own consumption requirements or to simultaneously intensify their food production practices so as to free up limited pieces of land on which to grow higher-value crops for market. Both are risky strategies and the latter will almost certainly need external financial and technical support (Poulton and Ndufa 2005).**
- **They have more capital to invest in expanding production or improving production practices. Production expansion can be achieved through intensification (e.g. applying more**

fertiliser) or extensification, according to circumstances.

- **They are better able to bear risk, due to their higher incomes and asset base. The risks associated with commercialisation are numerous and linked to experimenting with new crops, varieties, production techniques and market channels. Returns to smallholder agriculture, especially under rained conditions, are notoriously variable, but production for market adds the extra dimension of market and price risk. As capital is scarce for (most) smallholder households, any investment to expand production carries a high opportunity cost, as returns are never assured.**

Mellor (2014) notes that it was better-off smallholders who drove the increase in production and, especially, marketed surplus during the Green Revolution in Asia. In turn, those smallholders employed labour and purchased non-tradable goods and services to the benefit of poorer households within their communities. The question then is whether, in high population density areas of Africa, there remain sufficient of these better-off smallholders to lead the agricultural commercialisation process. Obviously, the distribution of landholdings and assets varies from country to country, but Mellor argues that the basic answer to this question is 'yes'.

Finally, we might expect men to engage in smallholder commercialisation more quickly than women, although this will depend on local social norms and the gendered division of labour. It is often observed that men seek to control the major sources of cash income into a household while women have particular responsibility for food provision. This may even lead to men taking over production of what was previously a women's crop when market opportunities increase (von Braun et al. 1994). Similarly, men may capture a disproportionate amount of available purchased inputs for use on their fields (Udry et al. 1995). Conversely, in southern Ethiopia, Lim et al. (2007) found that women's bargaining power within a household – proxied by the share of livestock assets that the wife would control in the event of divorce – was positively (albeit weakly) correlated with the production of the local staple crop, *enset*, and negatively correlated with the production of coffee.

3.2 Later commercialisation of smallholder production systems: East Asian experience

Early smallholder commercialisation is an incremental process, with some households able to engage

increasingly with markets while others (initially the majority) remain in semi-subsistence mode. However, later in the structural transformation process, and particularly once the Lewis turning point has been passed, these dynamics change radically.

Pingali (1997) summarises the experience of the first East Asian 'tigers' almost 40 years after the onset of the Green Revolution. During this time, the economies of South Korea and Taiwan had grown dramatically, and were now dominated by manufacturing and services. Labour demand in those sectors had increased to the point where the rural population had begun to fall. In these East Asian nations, with high population densities, Pingali observed the following significant implications for agricultural production:

- **Two factors combined to drive agricultural mechanisation. Firstly, fewer workers were left to farm the available land, so capital was substituted for labour. Secondly, the only way that remaining agricultural households could obtain incomes that were remotely comparable to those available from employment in manufacturing and services was to combine their labour with capital, so that each worker could cultivate an increasingly large area of land. Labour power for land preparation was progressively replaced by animal traction (buffalo in East Asia), power tillers and, ultimately, tractors. Planting and harvesting activities were also eventually mechanised.**
- **Similar forces influenced the use of purchased inputs and services. While labour is plentiful, nutrients may be applied to the soil via a range of practices that make intensive use of household labour. These include manure application and composting. In semi-arid areas of Africa, termite mounds can be added to soil as a source of nutrients (Cavendish 1999). As labour becomes scarcer, households increasingly rely on purchasing nutrients in the form of chemical fertilisers. Herbicides can also be applied to reduce the requirement for weeding labour.**
- **Expanding and increasingly affluent urban populations represented growing markets for agricultural produce, although the composition of food demand evolved over time. Demand for staple food grows with population, but may even fall slightly in per capita terms. Meanwhile, demand for livestock products, fruits and vegetables grows rapidly with rising incomes. The evolution of demand created opportunities for farmers who were able to observe market trends. In turn, the returns from responding to new opportunities enabled enterprising farmers to accumulate capital**

with which to purchase equipment and inputs and to acquire additional land as neighbours sold up to move to urban areas.

- **Not all farmers were equally adept at identifying market opportunities, nor were they all equally placed to respond to them. Those who were unable to successfully commercialise their production over time, but who nevertheless did not migrate to urban areas, became wage labourers on the expanding farms of those who were commercialising.**

Despite the inequality noted in the final bullet point, this was still a relatively benign process. Two major factors explain this. Firstly, it was driven by labour demand in the urban economy. Most labour was thus drawn into more remunerative employment, rather than being ejected from the agricultural sector with nowhere else to go. Secondly, as a result of land reform programmes following World War II, East Asia entered the structural transformation and agricultural commercialisation processes with relatively egalitarian landholding patterns (Mennen 2009). In turn, modest income increases across much of the rural population provided important demand for the growth of labour-intensive manufacturing (Mellor 1986), although exports were also a major part of the East Asian growth story.

In this story the market conveyed the incentives for farm households either to exit agriculture or to consolidate and mechanise holdings if they remained. It also created opportunities for some households to accumulate capital that could support either of those strategies. Those that could not successfully implement either strategy ended up as wage labourers on the farms of others.

An important point to note, however, is that the systemic commercialisation of smallholder agriculture occurred late in the structural transformation process (Timmer 2009). Pingali (1997) observed that, 40 years or so after the start of the Green Revolution, land consolidation (indicated by the number and average size of agricultural holdings) had commenced only in South Korea and Taiwan. Using the indicator proposed in footnote 1 and data from the World Development Indicators database, in 1995 this indicator had a value of 7.25 in South Korea. By contrast, among the six APRA countries, the highest value is found in Ghana, which was only 1.25 in 2013.⁶ Wiggins (2017) shows an ongoing decline in average farm sizes across China and a range of countries in South-East Asia and South Asia (the one exception being Vietnam). In other words, land consolidation has yet to commence in most of Asia.

This suggests that market-driven land consolidation is also still a long way off in most, if not all, of Africa.

To reiterate, in the early stages of the structural transformation, developments in the non-farm economy create opportunities for a minority of farms to do well, but the preponderance of under-employed labour in rural areas encourages a semi-subsistence orientation to production.

3.3 Smallholder commercialisation in land-abundant areas

The conclusion of the previous section suggests that the potential for agricultural commercialisation is higher in more land-abundant areas. This argument assumes that agro-ecological potential is controlled for. If population density is low, hence land is abundant, because soil quality is poor and/or rainfall is low, then these same conditions limit the potential for (crop-based) agricultural commercialisation.⁷ For the purposes of this paper, therefore, we consider areas of medium or high agro-ecological potential with a population density of less than 100 persons per km² as land-abundant.⁸

Where agro-ecological potential is medium or high, the question arises as to why an area remains relatively sparsely populated. Possible reasons for this include the following:

- **Historically, the area has been prone to conflict, which has discouraged settlement and investment. Parts of rural Mozambique may provide examples of this.**
- **Historically, the area has been prone to diseases affecting humans and/or animals. Again, parts of rural Mozambique infected by tsetse fly may provide examples of this. Similarly, settlement in parts of central-north Ghana has historically been discouraged by the prevalence of river blindness (onchocerciasis), but effective control measures have been implemented since the 1980s. Around the same time, Gokwe, in north-western Zimbabwe, was largely cleared of tsetse fly and the farmers who moved in contributed strongly to the expansion of smallholder cotton production in the country over the following decade.**
- **Areas that are remote from major urban centres tend to suffer from poor infrastructure. Chamberlin et al. (2014) argue that remoteness combined with poor roads explains why much land remains uncultivated in Africa. In addition to road infrastructure, lack of irrigation may be an impediment to cultivation in areas where**

rainfall is low but rivers do flow. Historically, a low water table may also have discouraged settlement, as people lacked the capacity either to store water across seasons or to draw water for consumption.

- **The realisation of agro-ecological potential requires some form of technical 'fix', which in turn requires a substantial (and probably public) initial investment. The exploitation of the Cerrado area of Brazil, for example, required substantial infrastructure investment, but also large-scale application of lime on soils that were initially too acidic, plus the development of plant varieties that could tolerate seasonally high temperatures (World Bank 2009). It is argued that the Guinea savannah zone that stretches across Africa just above the equator then down into central-southern Africa could be developed for commercial agriculture if a similar mix of investments was forthcoming (Ibid.).**

Where public investments do enable smallholder cultivation to expand in land-abundant areas of medium or high agro-ecological potential, the potential for smallholder commercialisation is high. Households with generous land-labour ratios can both satisfy their basic subsistence requirements and cultivate crops for market on additional plots, using animal traction and perhaps also hired labour where available. In Gokwe, for example, the top decile or so of smallholder cotton producers, who typically farmed 5–10 hectares of cotton, relied heavily on hired labour (along with animal traction) for the cotton production effort, with the household head and/or other household members primarily providing supervisory input. Meanwhile, food crop production is undertaken almost entirely with family labour (Tschirley et al. 2009). In such areas, the supply of hired labour may be seasonal, with workers migrating from other zones at critical times in the seasonal calendar.

The experience of resettlement farmers in other parts of Zimbabwe supports this argument, albeit with one important caveat. Whereas cotton farmers in Gokwe received production support (extension advice, seasonal input credit) from cotton companies, many resettlement farmers have received very little support, which has considerably slowed the process of asset accumulation and their ability to expand production in response to market demand (Hanlon et al. 2012; Scoones et al. 2012; van den Brink 2000).

Lack of public investment to facilitate smallholder production in land-abundant areas with medium or high agro-ecological potential is thus a major reason why more commercialised smallholder production is not observed in such areas. On the other hand, we

should not assume that only smallholders will seek to obtain land of medium or high agro-ecological potential if it is possible to use this land to grow crops profitably for market. Recent large-scale farm expansion in Ghana has focused on the Brong Ahafo and Northern regions (Cotula et al. 2014), areas that were part of the onchocerciasis control efforts until the 1990s. More pervasively, the recent rise of medium-scale farms in Africa is discussed in section 5.

3.4 The benefits of smallholder commercialisation

We consider this issue at three levels: household (microeconomic), rural non-farm economy (mesoeconomic) and macroeconomic.

At the household level, basic neoclassical economic theory suggests four major benefits of commercialisation. Firstly, production that is oriented towards the market can respond to remunerative (new) opportunities. Consumers elsewhere may be willing to pay much more for a product than the producers themselves are, due to differences in income levels, preferences, etc. The condition for gains being realised is that transport and transaction costs are lower than the price differential that can be achieved through trade. This emphasises that smallholder commercialisation is highly dependent on conditions outside of smallholders' control (e.g. road infrastructure and market institutions that reduce transaction costs).

Secondly, production that is oriented towards the market has the potential to make the most efficient use of smallholders' resources, assuming that they can specialise in production activities in which they have comparative advantage (von Braun and Kennedy 1994). In practice, however, this argument needs considerable qualification. The major practical problem is that producers who specialise in production for market then have to depend on food markets for their own consumption needs. While food markets are high-cost and/or volatile, few smallholders are willing to do this. Thus, especially in the early stages of the structural transformation, specialisation tends to be limited. Smallholders who do produce for market are often those with above-average land resources, who can, therefore, both produce a fair proportion of their own food needs and manage to produce crops for market (Heltberg 2001, cited in Leavy and Poulton 2007). This can be thought of as diversification *beyond* staple food production (Poulton and Ndufa 2005), rather than specialisation away from staple food production. If the degree of production specialisation is measured by a Herfindahl index of land areas or crop values, early

development of production for market may register as reduced, rather than increased, specialisation (Leavy and Poulton 2007). True specialisation generally awaits the later stages of the structural transformation (Pingali and Rosegrant 1995).

Thirdly, where production for market does increase the profits from farming, this permits a dynamic process of asset accumulation to occur. Two observations are important here:

- **As noted previously, not all efforts at production for market are successful and lead to increased profits from farming. Furthermore, some apparently profitable activities turn out to be dependent on support received by smallholders from outside sources (e.g. a development project) and collapse once that support is withdrawn.**
- **Increased incomes from farming can be consumed, re-invested on farm or invested elsewhere. Where farms are small and non-farm income sources limited, such that farm households are highly capital constrained, the marginal propensity to consume out of additional income may be expected to be high. This limits the extent of capital accumulation and hence commercialisation on the farms concerned, but, when multiplied across numerous poor households, the multiplier benefits for other parts of the economy can be significant. Other farm households may choose to invest much of their increased incomes in non-farm or general assets, including education. Thus, higher farm incomes may support diversification out of farming ('stepping out'), as well as agricultural expansion ('stepping up').**

Fourthly, commercialisation is often associated with increased productivity in agricultural production through increased use of capital inputs and/or good agricultural practices. This relationship requires brief discussion – not least so that APRA is consistent in its terminology in the coming years. Increasing reliance on the market for the acquisition of production inputs, including labour, is part of our definition of commercialisation. Does this, therefore, mean that intensification is a synonym for commercialisation? Agricultural development is replete with examples of projects that set out to promote uptake of various forms of productivity-enhancing purchased inputs. While some of these may have been transformative, many proved unsustainable, and uptake collapsed once the promotional efforts ended. A key lesson drawn from this experience is that efforts to promote new production practices generally need to be accompanied by measures to improve producers'

linkages to remunerative output markets, unless there is a means of subsidising the new practices over the medium-to-long term. Remunerative market opportunities provide both the incentives and at times the revenues for farmers to adopt new production practices. This suggests that we should emphasise increasing engagement with the market for the sale of produce as the leading element of our definition of commercialisation, with increasing reliance on the market for the acquisition of production inputs (including labour) providing complementary evidence of the deepening of the commercialisation process. Nevertheless, we should recognise that increased use of capital inputs – whether fertiliser for intensification or mechanisation for extensification – is one of the major channels through which commercialisation enhances livelihood outcomes for producers and potentially also their workers, as well as for the wider economy. We should also recognise that there will be exceptions to the rule that sustainable intensification is driven by increasing engagement with agricultural output markets – e.g. households that use non-farm earnings to intensify staple food production on small plots close to home while either food markets remain high-cost or volatile or their off-farm earnings appear insecure or unpredictable.

At the mesoeconomic (rural non-farm economy) and macroeconomic levels, there are important spillover effects from smallholder commercialisation, especially in the early stages of the structural transformation, when the agricultural sector is still fairly large relative to manufacturing and services. These spillover effects were listed briefly in section 1. Many of them also flow from large farm growth. However, relatively poor smallholder households may devote a large portion of incremental income to the purchase of non-tradable goods and services (Delgado et al. 1998), thereby generating larger consumption and production multipliers than large-scale farms (Bautista and Thomas 1999), where a greater share of incremental income is ultimately spent on imported capital inputs and consumer goods.

Smallholder commercialisation can expand demand for manufactured goods and services produced in major urban centres (Mellor 1986), but is also *the* major driver of growth of the rural non-farm economy (Haggblade et al. 2007). In areas where smallholder commercialisation is fairly broad-based (e.g. export cash crop-producing zones with moderate-to-low population density), rapid expansion of 'rural towns' can be observed in periods of sustained high prices or productivity increase (Jedwab 2013). This occurs both because farm households demand greater quantities of production inputs and consumption goods and because some of the profits

from crop sales are invested in real estate in nearby urban centres.

De Janvry and Sadoulet (2002) argued that the nature of local food products – tradable vs non-tradable – has a major influence on the spillover effects that are realised from agricultural (including smallholder) commercialisation. Where major food crops are tradable (e.g. rice), increased productivity and marketed volumes have limited impact on the consumer price, which is largely determined by international markets.⁹ Thus, the majority of the benefits from commercialisation remain in rural areas. By contrast, where major food crops are non-tradable (e.g. cassava, yams, white maize), increased productivity and marketed volumes put downward pressure on prices, thereby passing a share of the benefits onto consumers. This in turn may assist in keeping urban wages low, which is good for growth in tradable manufacturing and service sectors. However, farmers will only end up better off if their rate of productivity growth exceeds the rate of decline in output prices. As several major African food crops are non-tradable and demand is inelastic with respect to price, demand constraints are a non-trivial issue for smallholder commercialisation in Africa, ongoing urbanisation and growth in incomes notwithstanding (Diao et al. 2003).

More recently, Gollin et al. (2013) and Jedwab (2013) have highlighted the phenomenon of ‘consumption cities’ in Africa. They argue that natural resource exploitation, including agricultural exports, has provided a major stimulus to urban growth by increasing demand for goods and services that are typically produced in urban areas. However, natural resource revenues may also discourage production of tradable manufacturing and services products through Dutch disease effects. Thus, economic activity in the urban areas that have grown in response to natural resource exploitation has tended to be dominated by production of non-tradable services. Meanwhile, tradable manufacturing and services products are imported to meet growing local demand. Thus, while urbanisation rates are similar in Africa and Asia, the share of the labour force employed in manufacturing, in particular, is much higher in Asia. As tradable manufacturing and services products are subject to international competition, whereas non-tradable services are not, productivity growth tends to be higher in the former. So-called ‘consumption cities’ are, therefore, likely to be associated with slower economic growth in the medium-to-long term than ‘production cities’ that produce tradable manufacturing and services products (Gollin et al. 2013).

The analysis of Jedwab (2013) focuses on the impacts of cocoa expansion in Ghana and Côte d’Ivoire. Jedwab portrays cocoa production as generating (once-off) high rents from the exploitation of primary forest and as having involved relatively little productivity enhancement (beyond the release of new tree varieties) during the past century of cultivation. By contrast, commercialisation of the production of (internationally) non-tradable food crops or of lower-value tradable crops – which would require considerable investment in productivity enhancement along the value chain to be competitive internationally – could be expected to make qualitatively different contributions to the process of structural transformation.

Gollin et al. (2013) and Jedwab (2013) analyse historic data and find consistent patterns. However, just as the problem of Dutch disease has been managed better by some countries than others, this does not mean that natural resource exploitation must lead to the rise of consumption cities. Whitfield (2011) and Whitfield et al. (2015) argue that failures of industrial policy explain why Ghana has not developed a stronger manufacturing sector and seek explanations for these failures in the nature of the Ghanaian political settlement.

Literature on the later stages of the structural transformation has tended to focus on the impact that changes in urban areas have on the structure and market orientation of agricultural production, rather than on the contribution of agricultural commercialisation to structural transformation. However, work in Latin America and elsewhere indicates that, in middle-income country contexts, the small size of the agricultural sector relative to gross domestic product (GDP) understates its importance to overall growth due to its forward linkages to both agro-processing industries (as a source of raw materials) and food retail (World Bank Group 2015; Valdés and Foster 2010).

3.5 Losers from smallholder commercialisation

During the early stages of the structural transformation, the systemic changes associated with smallholder commercialisation are modest. Households in favoured areas and/or with above-average resource endowments may seek to respond to growing market demand for agricultural products, but the majority of smallholder households maintain a pattern of semi-subsistence production that evolves only slowly.

At household level, therefore, those at greatest risk of incurring losses due to agricultural commercialisation

are the very households who experiment with greater production for market. Experimentation with new techniques or ventures into new crops or markets may ultimately prove unsuccessful. Investment in production intensification or extensification may not generate the hoped-for financial returns, perhaps due to adverse weather events or shifts in market prices. If too many farmers invest in response to the same perceived market opportunity, yet demand is inelastic, increased supply can cause prices to crash, leaving many of these farmers worse off (Diao et al. 2003), though consumers experience a corresponding gain. Farmers are particularly vulnerable to price or other changes when they are somehow 'locked in' to production of a particular crop. Planting tree crops with long gestation periods provides one example of this (Baumann 2000). In the case of tree crops, households also have to wait several years for commercialisation benefits to come on stream, even though they have to divert land and labour to the new venture from the outset (Bellin 1994).

These risks are believed to be an important factor discouraging many resource-poor smallholder households from increasing their exposure to agricultural output markets. On the other hand, it is often the early innovators in new crops and markets who achieve the greatest gains, as they commence production before a wider supply response has bid prices down.

Von Braun and Kennedy's (1994) seminal work examined the intra-household impacts of early stage smallholder commercialisation. This series of 11 studies in 10 countries investigated whether smallholder commercialisation might benefit male household members – typically household heads – but at the expense of female members (through increased, but unremunerated, labour demands) and thereby also children (through reduced care time or poorer nutrition, as mothers' cropping activities for household consumption suffered due to extra workloads producing crops for market). In these 11 studies (in Gambia, Guatemala, India, Kenya, Malawi, Papua New Guinea, the Philippines, Rwanda, Sierra Leone and Zambia):

- **The most common finding was that, with the introduction or expansion of some production activities for market, male labour increased relative to female labour across the totality of household agricultural activities.**
- **However, decision-making in the commercial activities was also dominated by men, and they typically controlled the resulting**

revenues.

- **In five cases, participation in a commercialisation initiative was associated with households increasing their total expenditure on food; in three cases, it was not. In all cases where food expenditure increased, this was partially due to increased expenditure on more expensive foods, such as meat and fruits.**
- **In eight cases, calorie consumption by participating households increased; in one case, it did not. More diverse diets (as above) were expected to have additional nutritional benefits.**
- **Participation in cash cropping (even non-food cash crops) had no negative effects on household nutrition or health, as measured primarily by pre-schooler weight-for-height scores, morbidity rates and sickness profiles. However, the observed positive effects were small.**

These findings are consistent with bargaining models of smallholder household decision-making, in which female members can negotiate changes to household practices to compensate for any adverse effects from new, market-oriented activities controlled by men. However, unequal bargaining power within such negotiations – as, for example, would be consistent with the woman maintaining a basic 'reservation position' during the negotiations – will also result in unequal sharing of the benefits from commercialisation. This is a topic that will be central to the APRA studies.

In the later stages of the structural transformation, smallholder commercialisation is associated with profound changes in landholding patterns and market orientation of production. However, the main factor that limits the number of losers from smallholder commercialisation at this stage is the same factor that drives it: demand for labour from outside the agricultural sector, principally from the manufacturing and service sectors. The main losers at this stage, therefore, are those individuals or households who neither make the transition to non-farm employment nor manage to 'step up' their agricultural production activities through consolidation of landholdings, progressive mechanisation of production and engagement with remunerative market opportunities. They are likely to end up as landless rural households, dependent for their livelihood on employment on other people's farms.

4. LARGE-SCALE COMMERCIAL AGRICULTURE

The second type of agricultural commercialisation occurs when smallholder farm households are complemented or replaced by medium- or large-scale farm enterprises. This section examines large-scale farms, leaving consideration of medium-scale farms to the next section.¹⁰

As large-scale agricultural enterprises rely almost entirely on the market for the sale of produce and for the acquisition of production inputs, including labour, their insertion into the agricultural landscape represents (a degree of) commercialisation at agricultural sector level, even if they coexist with large numbers of semi-subsistence smallholder households. Their presence and activity in both input and output markets may also have spillover effects that encourage commercialisation among nearby smallholder households (see below). We distinguish two main types of large-scale farms:

- **large-scale family farms, which are managed by members of the family who own or rent the farm, with family labour complemented by mechanisation and hired labour**
- **estates or plantations, which are managed by professional persons employed or contracted in by the owners (who could be private individuals or a company). Estates and plantations are often associated with investment in a processing facility, with the farm operation supplying raw materials for the processing facility as part of a vertically coordinated operation.**

In both cases (but more commonly in the latter case), the large-scale farm also buys produce from surrounding smallholders for processing at its facility or for sale through its marketing channels. As an interlocked part of these arrangements, it may also provide technical advice and/or seasonal credit to these 'outgrowers' in an effort to raise the quantity and/or quality of their production.

Large-scale farms and their associated processing operations often also create employment for members of smallholder households in surrounding areas.

4.1 Why do large farms exist?

At the end of the structural transformation, large-scale farms emerge as the result of the operation of market forces, assuming that countervailing political forces do not arise to provide protection to small-scale farms. As urban demand for labour pulls labour out of rural areas by offering higher wages in urban employment, this exerts two pressures on farms. Firstly, declining labour availability means that available land can only be farmed if capital is substituted for labour (i.e. through mechanisation). Secondly, farms can only achieve returns to labour (and hence pay wages) remotely comparable to those obtainable in urban areas if they complement labour with capital so as to cultivate greater areas of land per worker (again, achieved through mechanisation). This process of agrarian structural change is likely to produce primarily large-scale family farms, although some estate farms may also be created as the land market becomes increasingly active.

By contrast, these market pressures are not observed during the early stages of the structural transformation, when rural labour is plentiful and low-cost, but capital is expensive.¹¹ In these conditions, the relative competitiveness and efficiency of large-scale vs smallholder farms are hotly debated (Collier and Dercon 2009; Wiggins 2009). The high yields and quality of large-scale farms – visible and impressive – are also often achieved at high cost. Relative to smallholders, large-scale farms economise on what is often the most abundant factor of production (labour) while making more intensive use of scarce factors such as capital and land.

Poulton et al. (2010) observe that large-scale farms enjoy competitive advantages over smallholders in many areas (e.g. input, output and financial markets, information, quality assurance and traceability), but are disadvantaged when it comes to labour costs. Three main arguments are advanced for why smallholders enjoy a labour cost advantage.

The first argument is that, because they share in the profits or losses of smallholder household production, family members are more motivated to perform

tasks diligently than are hired labourers on large-scale farms. This economises on labour monitoring, which is particularly important and challenging where the landscape comprises several micro-ecosystems (Binswanger and Rosenzweig 1986).

A possible counter-observation to this is that large-scale farms have been observed to perform well in various horticulture and floriculture activities (Maertens and Swinnen 2009; Tyler 2007a; Dolan et al. 1999), even though these activities are usually labour-intensive. One explanation is that quality standards in export markets demand traceability, which large-scale farms are much better placed to deliver than smallholders (Maertens and Swinnen 2009; Poulton et al. 2010). However, as noted earlier, horticulture and floriculture are less land-intensive and more capital-intensive than many other crops, and cultivation often takes place under more controlled conditions (irrigation, tunnelling), such that tasks are more uniform, although still requiring care.

Deininger and Byerlee (2012) raise the possibility that technological advances – such as pesticide- and herbicide-tolerant seed varieties, zero tillage practices and machinery operations guided by Global Positioning System (GPS) technology – may reduce the burden of labour supervision for field crops, hence reducing the competitive advantages of smallholder cultivation. These advances have so far made limited impact on African agriculture, although this could change in due course.

The second argument is that, because their labour resources are under-utilised due to small plots and limited demand from other parts of the economy, smallholder family members tend to ‘self-exploit’ – providing labour beyond the point at which marginal revenue equals marginal cost. This will remain a powerful argument until urban demand pulls labour out of rural areas.

The third argument is that, even when they hire workers, smallholders often do so at lower cost than large-scale farms. They may hire people they know and trust from within their community and may also work alongside them in the (small) field, if hired labour is used to supplement family labour for particular tasks. Thus, monitoring is accomplished at minimal cost. They may also pay less than large-scale farms, who are subject to minimum wage legislation and may be bound (by law or brand reputation) to provide additional benefits beyond the wage. Note, however, that these latter arguments imply that employment on large-scale farms should generate greater benefits for the individuals concerned than employment on the farms of other smallholders.

Binswanger and Rosenzweig (1986) argue that the labour cost advantages of smallholders normally outweigh the competitive advantages of large-scale farms in low-wage economies – i.e. in the early stages of the structural transformation. The major exception they identify is when there are significant coordination costs associated with supplying large quantities of highly perishable materials to an expensive processing plant. Organising large numbers of smallholders to deliver a continuous flow of crops may be prohibitively expensive, resulting in times when either the plant operates at well below capacity or excess supplies are spoilt because they cannot be processed in time. Coordinating production within a single estate farm is then more efficient.

Reviewing experience with commercial production of a range of crops across Africa, Poulton et al. (2008) find that large-scale farms have, on balance, outperformed smallholders in a number of crops, including export horticulture, sugar (due to the demanding land preparation requirements for high-yielding production¹²) and flue-cured tobacco (where coordination is important). In tea, both smallholders and large-scale farms have proven competitive. Here, the labour-intensity and care required in the picking process favours smallholder production, while high perishability favours large-scale production. Meanwhile, smallholders dominate food crop production, cotton (labour intensive over a long season) and cashew – none of which are perishable products. Outside of former settler economies (see below), attempts to produce maize and cotton on large-scale farms in Africa have generally proven unsustainable.¹³ Even in Zimbabwe, the extension of support services for cotton production to smallholder producers in the 1980s and 1990s fairly rapidly drove large-scale farmers out of the sector, the exception being a small number of farms that continued to produce certified seed for the rest of the industry. However, large-scale farms had other options – including in export horticulture and flue-cured tobacco, where smallholders could not compete. The basic message from this review was that smallholders remain competitive with (or still outcompete) large-scale farms in many of the most important crops grown in Africa.¹⁴ However, following similar logic to that of Binswanger and Rosenzweig (1986), there are some crops in which large-scale farms enjoy a competitive advantage.

A similar message emerges from the review by Baglioni and Gibbon (2013). They estimate that the share of land under large-scale cultivation in Africa remained at a fairly constant 5–7.5 percent from the first decade of the twentieth century to the first decade of the twenty-first

– i.e. before the recent large-scale land rush. However, they also observe that the range of crops grown by large-scale farms narrowed – with horticulture coming to occupy an increasingly prominent place in terms of total investment, if not land area – as smallholders came to dominate crops that had been the preserve of settler farms prior to independence.¹⁵

A further argument for the enduring competitive advantage of labour-intensive (hence smallholder) production in Africa is the very limited progress with mechanisation – despite numerous government and donor efforts to promote it over the years. Expensive tractors, spare parts and fuel rarely compete on cost with abundant labour, augmented in areas of lower population density by animal traction.

The recent development of commercial tractor hire services in Ghana, analysed by Diao et al. (2014), is a significant exception to this statement, but may still be ‘the exception that proves the rule’. Ghana has enjoyed 30 years of sustained economic growth and considerable reduction in extreme poverty. Moreover, it has one of the highest urbanisation rates in Africa, such that rural labour is no longer plentiful (Nin-Pratt and McBride 2014; Jedwab 2013). By contrast, land is available in some parts of the country and the number of medium-scale farms (10–100 hectares) has increased by 360 percent between 1992 and 2012 to over 200,000. By 2005, farms of this size accounted for over 30 percent of cultivated land in Ghana, while farms of 5 hectares or less accounted for less than 50 percent (Jayne et al. 2016). In this context, private tractor operators have developed commercially viable hire services by importing second-hand tractors (makes for which spare parts can be reliably obtained or produced within Ghana), exploiting the different production seasons in the south-centre and north of the country (thereby generating returns on the principal capital asset for more than six months of the year) and serving interested smallholders primarily as an add-on to the main client base of medium-scale farms (Diao et al. 2014).

The facilitating conditions in Ghana are at best only partially replicated in most other African countries. Private tractor hire services do exist in some parts of many countries. However, more rigorous research is required to determine whether these are fully sustainable commercially, including covering the replacement cost of the tractor over its working lifecycle, or whether they are based on privileged access to subsidised tractors imported through government mechanisation schemes that are not replaced once they reach the

end of their working life. Either way, however, the Ghana example does illustrate the changing nature of African economies, hence the likelihood that increased agricultural commercialisation will be observed in more countries in the not-too-distant future.

Thus far, this section has argued that the establishment of large-scale farms is only justified on efficiency and competitiveness grounds in low-income (hence low-wage) economies under fairly tightly prescribed conditions related to the characteristics of particular crops. Why, then, do more large farms exist than is justified by these criteria? The basic answer is that powerful people use their power to acquire rights to land in the expectation that this will provide them with a source of rents (see Khan 2005; 1995).

This explains the establishment of colonial settler farms in southern and eastern Africa (Deininger and Binswanger 1995). Many of these were family farms. On the basis of their ethnicity, the settler families were often given access to the highest potential land – once existing owners and occupants had been forcibly removed. Where smallholder farmers were displaced to lower potential, sometimes semi-arid land (as in South Africa and Zimbabwe) that was also further from major market centres and under-served by infrastructure and support services, it is not surprising that large-scale farms could then outcompete smallholders.

The recent scramble for land in Africa (Schoneveld 2014; Deininger and Byerlee 2012) exhibits both similarities and differences to the colonial experience. There may have been fewer forcible removals of existing owners and occupants, but often there has been limited consultation, disregard of use rights other than direct cultivation, and inadequate compensation (Rahmato 2011; Vermeulen and Cotula 2010). Instead of generating family farms (with the exception of some South African farmers who have resettled in other African countries), this wave of land acquisitions has primarily created estates. The role of domestic investors in large-scale land acquisition is also now gaining increasing attention (Cotula et al. 2014).

In the process of land (re-)allocation, rents may accrue to politicians, bureaucrats and local leaders who facilitate the deals (Alden Wily 2011) and also often directly to the state, where it expropriates the land from its traditional custodians to lease it to investors (Wolford et al. 2013; Rahmato 2011). The rent streams to the new operators remain to be seen. Where prime land has been acquired and/or land is cultivated to crops, such as sugar, for which large-scale farms have an observed competitive

advantage, the acquisition of land use rights – often at very low rental values – should generate a strong profit stream. However, the argument of this section so far is that large-scale farms often do not outcompete smallholders in Africa. Moreover, mechanisation is rarely a cost-efficient way of cultivating land. Thus, we should expect many of the recent land allocations to remain undeveloped or under-developed, with only a fraction of the granted land area actually cultivated (see www.landmatrix.org for current evidence on this). Much of the cultivation that does occur may use quite labour-intensive methods.

If the rent streams to the new operators are uncertain, one explanation for the extent of recent land acquisition activity is that much of it has apparently been quite speculative. This was most notably the case for jatropha, for which viable commercial cultivation practices had not even been demonstrated, and other biofuel crops (Schoneveld 2014). Some speculators will succeed in selling on the land rights that they have acquired and make a profit; others may not. Meanwhile, there is evidence in some countries that many land transactions – albeit rarely the largest – have involved domestic investors (see Ali et al. 2015; Cotula et al. 2014; Rahmato 2011 for the case of Ethiopia). The balance of productive and speculative (or opportunistic) intentions in these deals remains to be seen.

4.2 Benefits of ‘early’ establishment of large farms

Consistent with its usage in the rest of the paper, the term ‘early’ in the title of this section and the next refers to the stage of the structural transformation. However, one way of summarising the arguments of these two sections is that the establishment of large-scale farms at this time may also be ‘premature’ in relation to what is going on elsewhere in the economy. These farms may be intended to ‘kick-start’ developments beyond their boundaries, but they can also have a series of unintended and deleterious consequences that are at least as important.

Promoters of large-scale farms argue that they can generate foreign exchange or food supplies to growing urban populations, along with employment generation. The previous section argued that large-scale farms have competitive advantages over smallholders in the production of some crops, which may increase foreign exchange revenues (e.g. horticulture, sugar, flue-cured tobacco). However, they are rarely the optimal way to increase the supply of staple foods to feed urban populations.

Successful large-scale farms may also generate *some* higher-quality work opportunities (greater security, better terms) than smallholder commercialisation. However, because large-scale farms face higher employment costs than smallholders, they will usually generate less employment per ton of output produced than smallholders would. Whether they generate more or less employment per hectare of land cultivated depends both on the capital-intensity of the large-scale production process and whether this capital is labour-saving (e.g. tractors for cereal production) or not (e.g. greenhouses or drip irrigation in horticulture). In Ethiopia, Ali et al. (2015) find very little permanent employment per hectare cultivated on large-scale farms. Nolte et al. (2016) also report strikingly low employment per thousand hectares ‘in operation’ across a sample of 127 projects in the Land Matrix database – figures that presumably must rise somewhat over time. Cotula et al. (2014) note that agricultural labour demand is inherently seasonal, so the number of permanent jobs created – where greater security and better terms are more likely to be observed – is likely to be low.¹⁶

One condition under which large-scale farms may generate more employment than comparable smallholder commercialisation efforts is if they are able to expand production well in excess of what is possible for smallholders. Maertens and Swinnen (2009) illustrate this effect for horticulture in Senegal, where large-scale farms proved to be more able than smallholders to compete in export markets that impose traceability requirements. Production of many horticultural crops is also inherently quite labour-intensive. The net result was more employment generated via a large-scale farm route than was possible via smallholder commercialisation.¹⁷ Van den Broeck et al. (2017) reinforce these earlier findings using panel data and show that, unlike most other forms of non-farm employment in the Senegal River Delta, employment on large-scale horticultural farms and their associated processing facilities disproportionately benefited poorer households; and 80 percent of those employed in this way are women.

Cotula (2013) argues that those who gain employment in new, large-scale enterprises – commonly including youth and/or migrant labourers – are often poorer than those whose livelihoods were disrupted by the investment (see next section). Unfortunately, there are many reports of disgruntled communities who argue that they were promised employment opportunities when investors were seeking their blessing for a project on their land, yet once the project was approved the promises went unfulfilled.

Another reason for policy-makers to encourage the establishment of large-scale farms during the early stages of the structural transformation is that less state facilitation and support is required for large-scale farms to operate than is required to promote smallholder commercialisation and productivity enhancement (Deininger and Byerlee 2012; Poulton et al. 2010). This is analogous to one of the main arguments for leveraging private capital for investment in public goods through certain public-private partnership schemes (Hodge and Greve 2009): draw on private resources where the state cannot deliver quickly enough. Establishing land rights can be a time-consuming business before a project commences. However, once up and running, large-scale farms can be expected to source their own capital, production inputs, technical and market information – services that need to be brought close to the farm gate, ideally with some degree of coordination, if large numbers of smallholders are to increase their production for market (Poulton et al. 2010). Few African state agencies have yet developed the capacity to coordinate the supply of services from diverse private providers or to effectively supply services to fill gaps left by private provision (e.g. extension). Political leaders who want to show some progress in the agricultural sector, but know that the state agencies at their disposal do not have the capacity to deliver much – and do not have the time for systemic reforms before the next election – may well find the prospect of large-scale farms attractive.

Similarly, for obvious reasons of land availability, large-scale farms are most likely to be established in areas of low population density.¹⁸ (Subsequently, population density may increase around successful farms.) Settling such areas for smallholder cultivation will require considerable investment in basic infrastructure. By contrast, some (very) large farm investments may include an element of basic infrastructure provision, such as feeder roads (Deininger and Byerlee 2012), which will ultimately benefit other settlers in the area. Conversely, however, some investors negotiate infrastructure requirements with state agencies (central or local) as a prerequisite for starting a project.

Once operational, large-scale farms may also generate spillover benefits for nearby smallholder farms. Ali et al. (2016) explore this question for Ethiopia by combining panel survey and geographic information system data. In this study, large farms are defined as those cultivating 50 hectares or more. Ali et al. (2016) find that, other things being equal:

- **The closer a smallholder farm is to a large-scale farm, the more likely it is to apply fertiliser to its maize crop. These effects are**

particularly pronounced where the large-scale farm is within 25km of the smallholder farm and where it also produces maize. However, no comparable effects were observed for sorghum, teff or wheat cultivation.

- **Proximity to a large-scale farm also has a modest influence on the likelihood that smallholders will use improved seed in maize and teff production.**
- **The closer a smallholder farm is to a large-scale farm (especially one that produces maize) the higher the observed maize yield on the smallholder farm. However, no comparable effects were observed for teff (where smallholder yields were 50 percent higher than those on commercial farms) or sorghum cultivation.**
- **Proximity to a large-scale farm had no impact whatsoever on the likelihood that smallholder household members would hire their labour out for off-farm work. Ali et al. (2016) comment that more work is needed on this, but this initial result suggests that most large farms in Ethiopia create little employment for local residents.**

The precise mechanisms through which these spillover effects operate are yet to be determined. However, the first two effects suggest that the presence of a large-scale farm may stimulate the development of local input supply systems. The yield effect could indicate that there is also some knowledge transfer or demonstration effect, although how this would work without many local residents being employed on the large-scale farms is unclear. Ali et al. (2016) observe that the productivity spillovers are not of the order of magnitude where they might be considered as a substitute for more conventional extension support to smallholder producers. Other spillover effects (e.g. greater presence of output buyers raising prices for local smallholders) are also possible.

4.3 Losers from early establishment of large farms

Losses from the establishment of large-scale farms centre on the issue of land access. Even in areas of low population density, land is rarely unused (Alden Wily 2011; Future Agricultures Consortium 2010). Therefore, the establishment of large-scale farms generally involves the curtailment of existing use rights to the land in question. Although the majority of land in Africa falls under customary tenure regimes, these are rarely accorded the same legal status as titled lands

(freehold, leasehold), which facilitates dispossession (Alden Wily 2011). Whenever existing use rights are under-compensated (in terms of alternative land and/or financial payment) and the new project is unable to generate sufficient secure and remunerative employment to replace the incomes previously generated from the land,¹⁹ those whose pre-existing land rights have been curtailed lose out. Sadly, this is all too common. The reasons for it include the following:

- **Especially in areas of low-to-medium population density, land use is rarely confined to crop cultivation, with other uses including grazing, and harvesting of firewood, wild foods and medicines. Careful surveys have documented the variety of these uses, their contribution to livelihoods and their particular importance to the poorest households (Beck and Nesmith 2001; Cavendish 1999; Jodha 1995). However, they are not easy to quantify through casual investigation, as many uses are seasonal and some are relied on primarily in years of poor rainfall. Thus, many are likely to be unobserved and under-valued if and when officials visit a site as part of the approval process for a new investment. Furthermore, such uses are inadequately recognised in compensation legislation in some countries (Cotula 2013).**
- **As well as income flows, existing land uses commonly provide social protection, nutrition, health and identity benefits, although these are hard to quantify. Neither financial compensation nor employment directly replaces all these aspects and it is unrealistic to expect that missing benefits will either be provided by the state or can be readily purchased from ‘the market’ in the areas in question.**
- **Many formal processes for assessing compensation are cursory (Vermeulen and Cotula 2010), driven by an imperative to facilitate investment, in a context in which the law may offer limited protection to those being displaced, while those with power are as likely to be allied with the investor as with the current users of the land. Reviewing available evidence from 180 land deals listed in the Land Matrix database,²⁰ Nolte et al. (2016) find that only 14 percent conducted consultation with local communities that amounted to obtaining ‘free, prior and informed consent’. In many cases, communities have expressed their rejection of projects in one way or another, but those projects have been approved regardless.**
- **In the process of facilitating investment, land use rights do not simply pass from existing users to the investor, but are first appropriated**

by the state, to then be allocated to the investor, often by way of a lease (Rahmato 2011). When projects fail, are delayed or do not deliver the benefits promised to local inhabitants, leases may not be revoked and, even if they are, the land is often not returned to the original users (Nolte 2014; Cotula 2013).

These immediate impacts are now widely documented. Cotula (2013) argues that, to date in Africa, ‘the negatives tend to outweigh the positives... As a broad generalisation, local livelihoods tend to be disrupted in ways that are not offset by the new agricultural venture’ (Cotula 2013: 139, 145). Reporting on a systematic scoping study of 170 studies, published between 2005 and 2013, claiming to report on impacts of large-scale land acquisitions in sub-Saharan Africa, Oya (2013) found that 60 percent ‘reported negative outcomes as their dominant conclusion... while fewer than 3 percent reported mainly positive outcomes’ (Ibid.: 1545). However, he observed that this need not be an unbiased reflection of reality. Some studies may have been purposively undertaken to demonstrate the negative impacts of large-scale land acquisitions. In other cases, it is possible that the short-term impacts were predominantly negative (e.g. displacement, under-compensation), but that positive impacts (e.g. employment, market linkages) would take longer to be realised – i.e. after the initial studies were completed. This is a point also recognised by Cotula (2013). Oya (2013) also observed that none of the studies contained a proper baseline assessment, documenting the often difficult and vulnerable rural livelihoods that preceded the investments.

Of equal concern are the longer-term implications of creating dualistic agricultural sectors. History teaches us that inequality tends to perpetuate itself (Acemoglu and Robinson 2013; North et al. 2009; de Ferranti et al. 2004). Large-scale farms can exert influence over both national and local decision-makers that unorganised smallholders are unable to match. This can reduce taxation revenues from large-scale enterprises and, from those reduced revenues, reduce the share that is spent on public goods provision (which would benefit smallholders) as opposed to transfers (which are more readily captured by powerful elites) (Lopez 2004).

Where large-scale farms are successfully established, they can enter into a symbiotic relationship with formal food retail systems and/or with processes of urban development more generally. In the former case, formal food retail systems develop on the basis of systems that work with large-scale suppliers and the low transaction costs that such relationships entail. There is an apparent correlation between African countries

that have first engaged with the retail revolution (Weatherspoon and Reardon 2003) and those with dualistic agricultural sectors (Poulton et al. 2010). Retail development is often good news for urban consumers, but these relationships can foreclose possibilities for later smallholder commercialisation. Transaction costs prevail over production costs in supply chain relationships. In the latter case, those displaced from their land by large-scale agricultural development may become cheap labour for manufacturing or mining, as in South Africa, ensuring that inequality is an economy-wide phenomenon.

These arguments arise from the experience of countries where large-scale farms were established on some of the highest potential land, so could then compete with smallholders – possibly also with additional support from a colonial state. The dynamics that reproduce inequality over time and across the economy may be weaker where large-scale farms are established in the midst of a competitive smallholder sector. Yet, the lobbying power of large farm interests should not be underestimated (see also comments below on medium-scale farms). This is an important subject for research. The danger is that dualistic agricultural sectors lay the foundations of inequality for generations, even centuries to come – potentially long after the problem of extreme monetary poverty, as measured by the current international poverty line, has been eradicated.

4.4 A note on contract farming and outgrower schemes

Contract farming is a system whereby a buyer of an agricultural commodity – usually a processor or exporter – supports smallholder suppliers to increase the quantity and/or quality of their output through provision of pre-harvest services, typically input supply on credit and extension advice. The input credit is recovered through deductions made at the time of purchase and the increased throughput in the processing facility or export contracts justifies the cost of extension provision and the risk entailed in credit supply. The ability to recover loans is central to successful contract farming (Poulton et al. 1998). Thus, there have to be mechanisms to minimise side-buying and side-selling of the contracted crops. Outgrower schemes are essentially contract farming where the processor also operates its own core estate. The ‘outgrowers’, i.e. contracted smallholders, then supply a proportion of the throughput to the processing facility, complementing the output produced on the core estate.

Contract farming is a popular means of promoting smallholder commercialisation (see section 3), albeit

one that works better for some crops than others (Oya 2012; Poulton et al. 2010). It is easier to enforce contract repayment where there are few buyers of the crop. This could be an outcome of market regulation, as is often the case in cotton (Tschirley et al. 2009; Poulton et al. 2004), or a by-product of high post-harvest perishability (Binswanger and Rosenzweig 1986). Buyers of crops that are not (widely) consumed by the communities that produce them are less likely to suffer competition from local, informal marketing channels. However, the same market power that enables buyers to enforce credit contracts can also be used to depress the terms of the contracts that are offered to smallholders – mostly obviously, lowering the prices for output or raising the price charged for inputs, but also changing the criteria used to accept or reject produce for processing (Henson et al. 2005). The dynamic of ‘agribusiness normalisation’ (Kusterer 1982) – whereby a processor offers attractive terms to smallholders to encourage them to enter into contract farming relationships, so as to increase throughput to its processing facility, then gradually depresses those terms over time once the desired level of capacity utilisation is achieved – has long been recognised in the contract farming literature.

In recent years, initiatives such as the New Alliance for Food Security and Nutrition have argued that contract farming and outgrower schemes are useful mechanisms to incorporate smallholders into agricultural commercialisation processes. The emphasis on outgrower schemes is particularly noteworthy, as these provide a means of incorporating smallholders into commercialisation processes in which large-scale farms are central. The critical question then is whether smallholder commercialisation is a central objective of such programmes or in some sense ‘window dressing’. A related question from the perspective of the processors, which is likely to be critical to the smallholder commercialisation outcomes, is as follows: what is the real justification for inclusion of outgrowers? Are they expected to enhance the efficiency of the entire processing operation (due to their labour cost advantages discussed earlier)? Do they enable the operation to expand beyond what it would otherwise be capable of, by making more land available for production of the crop in question? Or does their inclusion in the operation increase the political backing that it is likely to receive (for initial approval and during subsequent lobbying)?

The critical indicator of this is the size of the core estate relative to the scale of the processing operation. If a processor can (almost) achieve its break-even processing capacity utilisation from its core estate alone, then its incentive to invest in the productivity

and upskilling of smallholder outgrowers is greatly diminished. By contrast, if the core estate provides a means of stabilising the raw material supply over an extended season (for example, through use of irrigation technology that is not available to many outgrowers) and/or a place to experiment with innovative production techniques, but outgrowers provide the majority of the supply to the processing facility, then the processor will be more strongly incentivised to invest in their capabilities. Note that this still does not remove the possibility of 'agribusiness normalisation'; however, it is likely to slow its onset. Meanwhile, a smaller core estate may mean that fewer households are displaced or disadvantaged by the establishment of the project – the single most important way to moderate its potential negative impacts.²¹

5. THE RISE OF MEDIUM-SCALE FARMS

The previous section focused on large-scale farms, which have been the subject of considerable international interest in recent years. However, Jayne et al. (2016) argue that the recent rise of medium-scale farms – which they define as farms of 5–100 hectares²² – is quantitatively a much more important phenomenon in Africa. They quantify the spread of medium-scale farms in Ghana, Tanzania, Zambia and Kenya, with additional insights from Malawi. In Ghana, Tanzania and Zambia, the number and land share of such farms has been increasing rapidly since 2000, such that in Zambia there is now almost as much land cultivated on farms of 10–100 hectares as there is on farms of less than 5 hectares.

The rise in the number of medium-scale farms is as yet only imperfectly understood, but appears to be driven by growing market opportunities, with rising urbanisation and higher agricultural prices over the past decade. The high and rising urbanisation rate in Ghana (54 percent in 2015, according to the 2016 World Development Indicators database) was noted in section 4.1. Zambia's urbanisation rate has been fairly static, at around 40 percent, since the 1980s, but for much of this period it has been among the highest in Africa – an early African case of urbanisation driven by natural resource rents, in this case from copper. Urbanisation is proceeding rapidly in Tanzania from a low base (up to 32 percent in 2015).

However, unlike in East Asia, these growing market opportunities are occurring in a context of relative land abundance. This means that some farms can expand to meet the rising demand, but also that new farms can be established to do so. What the rise of medium-scale farms is revealing is that some people are much better equipped to respond to the growing market opportunities than others. Despite the epithet 'emerging farmers' that is sometimes used, initial evidence suggests that perhaps only 5 percent of the current medium-scale farmers have emerged from the ranks of smallholders. Instead, they are predominantly urban dwellers (often civil servants) who are choosing to invest in market-oriented agricultural production, plus rural elites (e.g. family members of chiefs) who have always enjoyed above-average landholdings (Jayne et

al. 2016). This is, therefore, a story of elite capture²³ of land as its value is observed to increase and as such displays similarities to the large-scale land acquisitions discussed in the previous section. Those obtaining the land have the human and social capital to negotiate the requisite procedures, and have also accumulated the financial capital to buy it. Jayne et al. (2016) observe that this elite capture of land is being facilitated by the transfer of land from customary tenure to 'willingness to pay modes of land acquisition' (Ibid.: 200) in all the countries concerned. This latter phenomenon is also observed in Malawi, which is much more land scarce than Ghana, Tanzania or Zambia.

Within Jayne et al.'s (2016) sample, Kenya provides an instructive and, in some ways, surprising contrast to Ghana, Tanzania and Zambia. In Kenya, first European then African elites laid claim to medium-to-large allocations of productive land in the colonial and early post-colonial periods (Bates 1989). As a result, land allocation in the high-potential regions of Kenya is as unequal as in Latin America (World Bank 2008). However, land in these regions is also largely claimed. As a result, Kenya – unlike Ghana, Tanzania and Zambia – witnessed a dramatic fall in the number of medium-scale farms over the period 1994–2006, as existing farms in both the 5–10 hectare and 10–100 hectare categories were apparently subdivided. The additional twist to this story, though, is that the share of land accounted for by the remaining farms in the 10–100 hectare category rose slightly, indicating a further consolidation at the top end of this distribution.

More research is required on the production systems of these medium-scale farms. Jayne et al. (2016) indicate, perhaps predictably, that such farms use their land less intensively than smallholders in the same countries. They also suggest that these medium-scale farms achieve returns per hectare that are similar to those achieved by smallholders. Returns per worker are much higher, however, because their production is less labour-intensive. Do these patterns reflect tightening rural labour markets, as discussed in relation to Ghana in section 4.1, or are such farms adopting modes of production that generate sub-optimal employment, given prevailing resource endowments?

Meanwhile, Jayne et al. (2016) express concern at the lobbying power of the growing numbers of medium-scale farmers, whose interests at best only partially overlap with those of smallholders. Two examples of this suffice. Over the past decade, the farm input subsidy programme in Zambia has consumed a sizeable share of the national agricultural budget, but the majority of benefits have been captured by medium-scale farmers

(Mason et al. 2011). Stretching back almost 35 years, maize policy in Kenya has supported the modest number of surplus-producing medium-scale farms in the Rift Valley at the expense of deficit households (rural and urban, most of them poor) in the remainder of the country (Poulton and Kanyinga 2014; Jayne et al. 2008; Bates 1989).

6. LIVESTOCK COMMERCIALISATION²⁴

Although complementarities with livestock have been recognised, the focus of the discussion so far has clearly been on crops. This section briefly reviews the commercialisation of livestock systems as the structural transformation proceeds.

The emphasis in this section is on how changes elsewhere in the economy – most notably, rising demand for livestock products as incomes rise, plus (eventually) the rising costs of rural labour – drive the commercialisation of livestock systems. Unlike for crops, and especially staple foods, few claims are made for the impact of livestock commercialisation on wider processes of structural transformation. This is because livestock typically accounts for a smaller share of agricultural GDP and labour than crops and also a smaller share of consumption expenditure, especially among poor households. Prices of livestock products, therefore, have less impact on the cost of living, wages and hence the potential competitiveness of industrial enterprises than the price of staple foods.

However, interactions between crop and livestock enterprises are hugely important throughout the process of agricultural commercialisation. Early on, livestock are a major source of power and nutrients for crop production. Increasingly, livestock enterprises become a major source of demand for cereal crops as components of animal feed. In some communities, livestock enterprises also represent a leading avenue for accumulation for eventual investment in productive activities outside of agriculture.

As in previous sections, important distinctions are made according to population density. Table 1 presents trajectories for three stylised livestock systems – pastoralist, mixed agro-pastoral and (semi-) intensive – which it suggests are most commonly found in areas of low, medium and high population density respectively. As with all such categorisations in this paper, however, there are important exceptions. In particular, in East Africa, pastoralists can be found close to several major urban centres, including Nairobi, Adama in Ethiopia and most major towns in Somalia.

The significance of the high-income elasticity of demand for livestock products as a driver of change

within livestock systems in countries experiencing rapid economic growth was highlighted by Delgado et al. (1999). Since then, the proliferation of large-scale commercial enterprises rearing chickens and pigs has been noted across Asia. Where population densities are high (as is commonly the case), these rely on purchased feed, much of which uses ingredients (maize, soybean) imported from the Americas. The increased demand for purchased animal feed in Asia is one factor commonly associated with the tightening of staple food markets (though not rice) that preceded the food price spike of 2007–08 (Tadesse et al. 2014; Piesse and Thirtle 2009). Meanwhile, consumption of poultry and pork has increased most dramatically in part because chicken and pigs exhibit a much lower feed conversion ratio than cattle, hence moderating the increase in consumer price as the transition to purchased animal feed has proceeded.

Where large-scale commercial enterprises have responded to the rapidly growing demand for livestock products, this has not completely displaced smallholder households, but it has altered their position within the relevant supply chains. For example, Xinchang, one of the largest suppliers of poultry meat in China, outsources close to half of its supplies to outgrowers close to its Shandong base (typically, old farmers with tiny plots, whose children have left for the city) who take day-old chicks and raise them to table weight in small barns.

The changes in mixed agro-pastoral systems in East Asia once the Lewis turning point had been passed were reviewed above with reference to Pingali (1997). Throughout South-East Asia, buffalos are also now being replaced by power tillers. By contrast, in Vietnam, where growth started later but has been very rapid, crop–livestock interactions remain important to commercialising smallholder production systems.

The author is unaware of examples of pastoralist systems in countries at an advanced stage in the structural transformation process. In East Africa, growing urban centres mean greater demand for livestock products, hence increased chances to profit from successful livestock enterprises, but also increased opportunities in other sectors. The maintenance of large herds is an

important strategy for dealing with drought, but access to water and pasture are significant constraints. Offtake rates continue to be modest. Increased use of contract

herders is observed, but many profits may ultimately be invested in non-farm enterprises, rather than in expanding livestock herds.

Table 1: Livestock commercialisation trajectories by zone as structural transformation proceeds

Population density / remoteness / agro-ecological potential			
	Low (e.g. semi-arid lands)	Medium	High (e.g. <2 hours from major urban centre)
Low-wage, modest demand from urban markets	<p>Pastoralist</p> 	<p>Mixed agro-pastoral</p> <p>(grazing-based, limited offtake, stock of savings as well as production value)</p>  <p><i>Input into cropping intensifies (animal traction, manure), some feeding</i></p>	<p>Semi-intensive or zero grazing</p> <p>(dairy, chickens, pigs)</p> 
Rising wages, high demand from urban markets	<p><i>More commercialised operations, increasing use of contract herding</i></p>	<p><i>Input into cropping gradually replaced by mechanisation or complemented by chemical fertilisers; increased reliance on livestock feed; eventually, greater specialisation of crop and livestock farms</i></p>	<p><i>Rise of larger-scale, commercial operations (zero-grazing) as demand for meat and dairy products rises with incomes</i></p>

Source: Author's own.

7. INDICATORS OF AGRICULTURAL COMMERCIALISATION²⁵

This paper has defined agricultural commercialisation as occurring when agricultural enterprises and/or the agricultural sector as a whole rely increasingly on the market for the sale of produce and for the acquisition of production inputs, including labour. This definition encompasses two contrasting commercialisation dynamics:

- **smallholder farm households shifting from semi-subsistence agriculture to production primarily for the market, in the process coming to rely increasingly heavily on purchased inputs and perhaps also labour in their production**
- **smallholder farm households being complemented or replaced by medium- or large-scale farm enterprises that are predominantly or purely commercial in nature.**

In areas of high population density, hence land scarcity, the first dynamic does not result in major changes to the agrarian structure during the early stages of the structural transformation. Rather, it is typically only a minority of smallholder households that are able to commercialise their agricultural activities. Successful commercialisation should lead to increased income, nutrition and other welfare indicators for household members, though not necessarily shared evenly between them. It may also generate increased casual employment for other rural residents. Some households will attempt to increase production for market and invest in additional purchased inputs in support of this objective, but if their efforts are not successful (due to adverse weather, disease or market conditions) they may sustain financial losses, with possible consequences for nutrition and other welfare indicators.

In the later stages of the structural transformation, agricultural commercialisation is increasingly driven by market forces in the non-farm economy, leading to major changes in the agrarian structure. The first commercialisation dynamic then gives way to the second.

APRA research will not observe market-driven consolidation of smallholder farms during the consortium's lifetime. However, it will examine the impacts of the establishment of new medium- and

large-scale farms among existing populations of smallholder households. The establishment of such farms represents agricultural commercialisation at the sector level, as medium- and large-scale farms produce predominantly or purely for market (unlike most smallholders) and rely more heavily on purchased inputs and hired labour than most smallholders do. Thus, the absolute level of market-oriented activity rises.²⁶ Even uncompetitive medium- and large-scale farms, which struggle for profitability and do not manage to scale up production and land use as anticipated, are likely to make incremental contributions to agricultural commercialisation at the sector level, assuming that they did not displace vibrant smallholder producers during their establishment.

By contrast, when examining initiatives designed to promote smallholder commercialisation, it is important to confirm that (and examine the extent to which) the initiatives have actually stimulated agricultural commercialisation before attributing observed welfare outcomes (good or bad) to such commercialisation. The remainder of this section briefly reviews a number of indicators for measuring smallholder commercialisation. All are intended as household-level indicators, although they could also be measured at area (e.g. district) or sector level. Indeed, APRA's longitudinal studies, in particular, may wish to collect data at area level to complement available data at household level. In practice, the choice of indicators will often be a function of available data.

7.1 Share of production sold

With two important caveats, this is arguably the best indicator of agricultural commercialisation, as it flows directly from the definition above. A simple household commercialisation index (HCI) gives the degree of commercialisation as the percentage of crop production marketed (Leavy and Poulton 2007; Strasberg et al. 1999):

$$\text{HCI} = (\text{gross value of all crop sales} / \text{gross value of all crop production}) * 100$$

A value of zero signifies total subsistence, and an index approaching 100 indicates higher degrees of commercialisation – i.e. a greater percentage of crop

production marketed.

The first caveat is that this 'simple' index is actually quite data-intensive, requiring information on:

- **the volumes of all crops that the household produced in a given season or year, including those that were produced for home consumption**
- **the sales value when crops were sold**
- **appropriate prices with which to value production that was consumed at home.**

In household survey work, this may raise issues of respondent recall, as well as questions of professional judgement regarding the value of production that was consumed at home.

The second caveat is that the index makes no meaningful distinction between a farmer who produces just one bag of maize and sells that one bag, and one who grows 50 bags of maize and sells 30 of them. On the basis of this index the first farmer, with an HCI of 100, would appear to be more commercialised than the second, who has an HCI of 60. In practice, smallholder households who grow more will often also sell more, albeit with variation according to household size and dependency ratios. The index is also problematic in that it does not distinguish distress sales of food crops by poor households (see section 2). Thus, apparently high scores on the commercialisation index, driven by sales of crops that are also eaten by the household yet are associated with low production volumes, should be examined as possible cases of distress sale. Distress sales are also likely to be associated with limited or no use of purchase inputs and/or adverse welfare indicators.

At crop or plot level, share of production sold could provide a possible indicator of agricultural commercialisation for intra-household analysis if the researcher was confident that:

- **in relation to crops, within the local gendered division of labour, a particular crop was the responsibility of female household members and represented one of the main opportunities for produce sale for women**
- **in relation to plots, sampled plots were managed and controlled by women and comprised a representative sample of such plots.**

7.2 Volume or value of production sold

This is much less demanding of data than the HCI. If applied to cross-sectional data, it may conceal the degree of market orientation among certain small farms. However, it is less susceptible to the problem of distress sales than the HCI. Increases in this indicator within a given farm population over time are likely to be a reliable indicator of commercialisation.

Note that caution should be exercised in applying this indicator for single crops, rather than households. This is because households may switch between crops that they produce for market, according to changes in price, the local availability of crop-specific support services and other conditions. Therefore, rising production of a single crop may overstate trends in commercialisation among the smallholder population in question. This indicator should only be used if the researcher is confident that one crop dominates market-oriented production activity in a given locality.

7.3 Share of land devoted to crops that are sold

This is a fairly crude indicator, in that it relies on being able to classify particular crops either as crops produced for market or for home consumption. This is straightforward for some crops, but not others. It may, however, provide some insight into commercialisation in situations where reliable data on crop sales are not available.

7.4 Quantity of inputs purchased

As discussed in section 3.4, this should not be the primary indicator of agricultural commercialisation. Instead, it should complement indicators (above) that assess engagement with the market for the sale of produce, to provide additional evidence of the commercialisation process. This is because increased use of purchased inputs is sometimes promoted (by external agencies) without establishing effective linkages to remunerative output markets. Some households may also purchase inputs using non-farm income sources, including remittances, without any intention of selling the resulting produce.

Nevertheless, as increased use of purchased inputs is one of the major channels through which commercialisation enhances livelihood outcomes for producers, as well as for the wider economy, this is a good indicator to monitor.

7.5 Quantity or value of labour hired

Many of the comments about purchased inputs also apply to labour hire. This is a good indicator to monitor as it provides one of the major channels through which agricultural commercialisation enhances livelihood outcomes for households (often poorer households) that do not directly engage in the commercialisation process.

7.6 Indicators of livestock commercialisation

Many livestock systems produce regular outputs. This is true of poultry production (for eggs or meat), dairy, fish farming, pigs and the fattening of cattle, sheep or goats. In these cases, commercialisation measures similar to those described for crops are appropriate. As market demand rises for chicken (meat), eggs or milk, local smallholder households may respond by increasing both production and the proportion of output that is sold as opposed to being consumed within the household. Where these activities are controlled by women, this may initially increase the income they earn. However, as with crops, as incomes from such activities rise, the likelihood of men investing and/or taking control rises. New commercial entrants are also likely to begin competing with smallholder producers. As with crops, the amount spent on purchased inputs and the quantity or value of labour hired in are useful

supplementary indicators of commercialisation for these livestock systems. Trends in such indicators can be monitored over time. Whereas for crops, it would be natural also to calculate the indicators on a per hectare basis, for livestock systems it might be more appropriate to calculate them in relation to the value of output.

It is more difficult to specify indicators for, or to reliably discern trends in, commercialisation of semi-subsistence or pastoralist ruminant systems. In semi-subsistence systems, offtake rates for sale are low, because animals are valued for multiple outputs (draft power, manure, milk) and as a stock of savings. Individual sales may be associated with major consumption or investment needs within the household (e.g. a wedding or a funeral) and as such represent a drawing down of savings rather than the implementation of a commercial strategy. In pastoralist systems, there is a preoccupation with maintaining or growing the herd size over time and, in particular, ensuring that herds can withstand and/or recover from the effects of drought and other shocks. In the short term, increased offtake rates may reflect the need to sell animals (perhaps at reduced prices) as water becomes scarce. After a drought, offtake rates may be limited for a few years by the priority of rebuilding herd sizes. Thus, trends in commercialisation can only be discerned over long periods – perhaps possible within APRA's longitudinal studies, but certainly not within the shorter panel studies.

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ENDNOTES

- 1 The paper, therefore, uses three discrete classifications to structure its arguments: small- vs medium- vs large-scale farms, early vs late stages of the structural transformation, and areas of low vs medium vs high population density. All three are heuristic tools and can most accurately be thought of as representing contrasting ranges on their respective spectrums.
- 2 One indicator of how far a country has progressed through the structural transformation is the ratio of the labour force employed in manufacturing and services to the labour force in agriculture. This ratio is applicable whatever the detailed trajectory of the structural transformation in a particular context.
- 3 Meanwhile, as theorised as early as Fisher (1935) and Clark (1940), high-income economies such as the UK have diversified out of manufacturing into tradable services, such as financial services, tourism and leisure. These have a high income elasticity of demand at high income levels.
- 4 It could also be that a project seeks to promote commercialisation among particular household members, e.g. women, in which case commercialisation occurs when the marketed share of the output that they are responsible for rises.
- 5 von Braun and Kennedy (1994: 389) comment that, 'There is a conscious effort by smallholder producers in all study settings to maintain subsistence food production along with new commercial production, despite apparently higher returns to land and labor from the cash crops. While cultural and taste factors may play a role, this reliance on food from own production under household control is a response to high transaction costs and risks related to market, employment, and production. It can largely be viewed as an insurance policy of farm households in response to a risky income environment.
- 6 The higher the transactions costs are in food markets and the closer households are to food insecurity, such as in the extremely poor study environments of Rwanda and Malawi, the stronger is their preference for high shares of subsistence production...'
- 6 The other countries' scores are as follows: Nigeria = 1.06 (2007), Malawi = 0.56 (2013), Zimbabwe = 0.52 (2011), Tanzania = 0.49 (2014), Ethiopia = 0.37 (2013).
- 7 We do not consider pastoralist systems and their commercialisation in this paper.
- 8 Headey and Jayne (2014) categorise African countries as high or low population density according to whether they are above or below this threshold. However, many countries include regions of both high and low agro-ecological potential, as well as urban areas.
- 9 Historically, however, the world rice market was thin and highly volatile, so most Asian countries in the second half of the twentieth century relied heavily on domestic production of rice and partially insulated domestic prices from world prices (Cummings et al. 2006).
- 10 Attempts to define smallholder, medium-scale and large-scale farms inevitably confront the challenge that some agricultural activities are more land-intensive, but less labour-intensive or capital-intensive than others. Horticultural and floricultural production are relatively labour- and capital-intensive, often requiring continual tending of plants, regular application of fertiliser, plus irrigation and perhaps also tunnels or greenhouses. However, they can generate multiple crops through the year and high returns per hectare of land. A three-hectare floricultural operation may be considered medium-scale while 50 hectares is large. At the other end of the spectrum, livestock-keeping in semi-arid environments may require several hectares per cow. However, despite these clear limitations to defining farm scale primarily in terms of land

- area, there are no easy alternatives, especially given available farm-level data. This paper, therefore, follows the dominant practice and refers primarily to land area. For example, Jayne et al. (2016) define medium-scale farms as those between 5 and 100 hectares, implying that large-scale farms are 100 hectares or more in size.
- 11 Barham et al. (1995) present a model in which large-scale farms – which are better able to withstand cyclical fluctuations in commodity markets than smallholder farms and which also have better access to capital – are able to buy up land from destitute smallholders following covariant shocks. However, this model starts with a dualistic agrarian structure and does not seek to explain its origins.
- 12 Tyler (2007b) argues that, once the land has been prepared, it may be most efficiently farmed by large-scale family farms, rather than estate farms, due to their superior labour motivation.
- 13 Other unsustainable attempts to promote large-scale agriculture, including the infamous groundnut scheme in southern Tanzania, are documented by Tyler (2007c).
- 14 Note that this does not mean that all smallholders outcompete large-scale farms. There are major variations in productivity across smallholder producers of any given crop, as might be expected from our recognition of ‘three rural worlds’ in section 3.1. However, if a sufficient number of smallholders can produce a crop at low cost, this may prevent large-scale farms from establishing and/or sustaining profitable production of the crop in question.
- 15 They also note the heyday of state farms during the late 1960s and 1970s, although their data points do not coincide with this period. State farms proved no more capable of competing with smallholders than private large-scale farms.
- 16 Permanent jobs may be created in associated processing activities, but these could equally accompany large-scale or smallholder production systems.
- 17 In a similar vein, Hichaambwa and Matenga (2016) compare three examples of agricultural commercialisation in Zambia. One of these is a block of established medium- and large-scale farms, while another is an outgrower scheme. They suggest that the former generates more employment than the latter, in which only a limited number of smallholders are able to participate. However, it is not clear how comparable their three cases are.
- 18 At cross-country level within Africa, this is illustrated by the fact that much of the land included in recent large-scale land deals is found in 6–8 countries (Deininger and Byerlee 2012; Schoneveld 2014), significant parts of which have low population density. When assessing future land availability, Deininger and Byerlee (2012) use a cut-off of 25 persons per km² which is much lower than the figure of 100 persons per km² that was discussed in section 3.
- 19 It is a defining feature of the early stages of the structural transformation that sufficient employment is not being created in urban areas to absorb labour displaced by radical changes in agrarian organisation.
- 20 This report is not restricted to African cases, although these are the largest group within the Land Matrix database.
- 21 The optimal size of core estate will vary according to the crop being grown. This is an important topic for research.
- 22 The inherent difficulties of classifying farm types based on hectareage were acknowledged in note 10. At the bottom end of this range, one might argue that the 5-10 hectare band is likely to include a significant proportion of ‘top end’ smallholders, especially in land-abundant areas. On the other hand, the figures in Table 4 of Jayne et al. (2016: 204) show that trends in numbers and land shares of farms of 5–10 hectares are more similar to trends for farms of 10–20 hectares than to trends for ‘smallholder’ farms of less than 5 hectares.
- 23 Some might argue that this is a fairly elastic usage of the term ‘elite’. Those establishing medium-scale farm enterprises do include MPs (political elites), senior district agricultural

officials (bureaucrats, but in some countries well-entrenched within major political parties, hence often counted by political economists as being among 'local elites') and low-to-medium ranking civil servants within national agencies. They also include entrepreneurs and a multitude of other urban professionals, including university lecturers and researchers! These people would simply be 'middle classes' in many other countries, but at present are still among the top decile by wealth and income in most African countries (Birdsall et al. 2011).

24 The author is indebted to Steve Wiggins and Andy Catley for insights and contributions towards this section.

25 This section draws heavily on Leavy and Poulton (2007).

26 Theoretically, this could be more than compensated for by a decline in market-oriented activity among the existing smallholder population, if, for example, the latter were outcompeted in markets by the new entrants and retreated back into subsistence production. However, the paper has argued that this is highly unlikely.



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