PART II

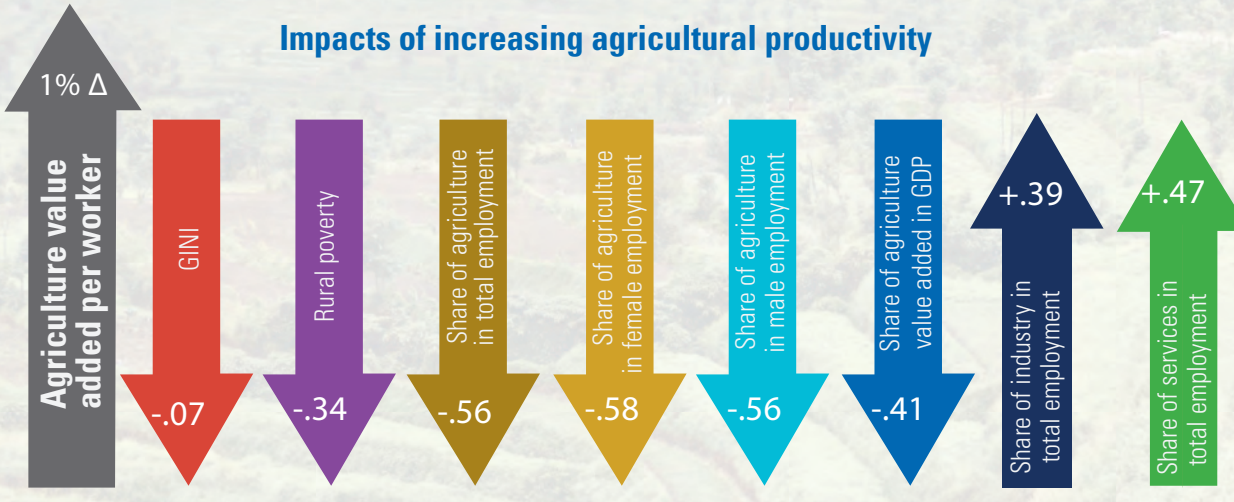
Challenges and Issues in Key Sectors and Impact on Inequality

Towards agriculture-induced accelerated reduction in rural poverty and income inequality in sub-Saharan Africa

Drivers of poor agricultural performance in Africa

- Adverse resource endowments
- Underinvestment and undercapitalization
- Poor policies and institutional failures
- Adverse trade regimes

Impacts of increasing agricultural productivity



Emerging lessons

- Adopt farming technologies
- Increase government investment in agriculture
- Improve market access in OECD countries
- Control corruption in agricultural sector management
- Involve farmers in the planning and implementation of agricultural policies and programmes
- Address tariff and non-tariff barriers to agricultural and agribusiness products
- Increase access to land, especially for women
- Improve access to affordable and modern farming inputs
- Increase predictability and credibility of agricultural policies, processes and rules

4 Agriculture, Rural Poverty and Income Inequality in sub-Saharan Africa

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4.1 Introduction

The developmental role of agriculture has long been recognized in the literature. As a leading sector of most economies in the developing world, agriculture helps facilitate industrial growth and structural economic transformation. Agriculture plays a multi-dimensional role in the development process, which includes eliciting economic growth, generating employment opportunities, contributing to value chains, reducing poverty, lowering income disparities, ensuring food security, delivering environmental services and providing foreign exchange earnings, among others. Due to the neglect of this sector, development progress has been hindered in a number of countries, which explains why 75 per cent of world poverty is rural and why sectoral income disparities have exploded, as well as why intense food insecurity and environmental degradation have become widespread (World Bank, 2007; Byerlee, de Janvry and Sadoulet, 2009).

In 2015, 62.3 per cent of sub-Saharan Africans still lived in rural areas, compared to over 80.0 per cent in countries such as Burundi, Uganda, Malawi, Niger, South Sudan and Ethiopia.[1] Agriculture remains the mainstay of Africa's rural economy and rural dwellers' livelihoods. In 2010, the agricultural sector employed an appreciable proportion of Africa's economically active population (54.2 per cent), compared to 54.4 per cent in Eastern Asia, 13.5 per cent in Southern Asia, 65.0 per cent in least developed countries and 40.6 per cent globally (Gollin, 2010: 3829). Further, the sector employs as much as 74.4 per cent of the economically active population in East Africa. The proportion of women employed in agriculture is as high as over 80.0 per cent in Burundi, Mozambique, Rwanda and Guinea (Odusola, forthcoming).

In 2015, in Africa, agriculture accounted for 17.5 per cent of total value added to GDP in Africa, and, specifically, over 50 per cent in Sierra Leone and Chad. In fact, out of the 15 countries in the world where agriculture accounted for more than 30 per cent of GDP, only one (Nepal) is not from SSA.[2] Between 2005 and 2015, 16 of the 33 countries globally whose annual average of agricultural raw materials as a share of merchandise exports was more than 5

[1] For more information, see the World Bank's World Development Indicators: http://data.worldbank.org/indicator/SP.RURTOTL.ZS

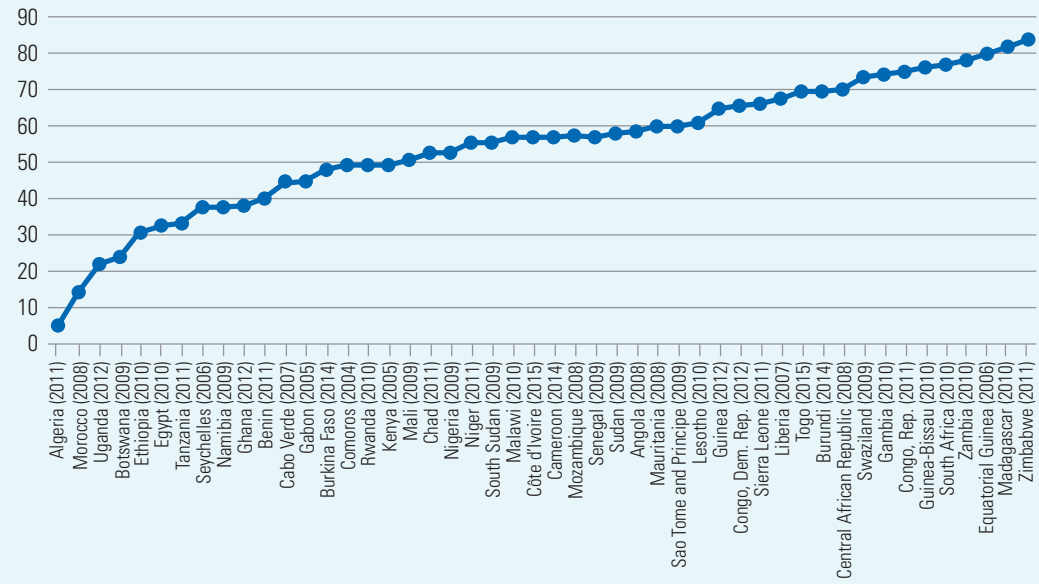
[2] Other countries are Sierra Leone, Chad, Burundi, Central African Republic, Ethiopia, Mali, Togo, Sudan, Niger, Burkina Faso, Comoros, Kenya, Rwanda and United Republic of Tanzania.

per cent were African. Therefore, the size and dimensions of agricultural activities are bound to have a substantial impact, not only on the aggregate economy, but also on livelihoods and living conditions, especially of rural dwellers and the poor.

Global poverty remains a rural problem, with more than three-fourths of the extremely poor people living in rural areas (Dercon, 2009; Byerlee, de Janvry and Sadoulet, 2009; World Bank, 2013). The lack of modernised African agriculture, which is characterised by subsistence and rudimentary farming, rainfed cultivation and low productivity farming, explains the endemic nature and high incidence of poverty in the continent. In Africa, rural poverty affects more than 60 per cent of the population in 19 countries and between 50 and 60 per cent in 14 countries. It is particularly alarming in Zimbabwe and Madagascar, where it affects over 80 per cent (figure 4.1).

The rural poverty phenomenon is structural, particularly given the high fertility rates in rural Africa and governments' urban-development policy bias. The fact that agriculture's employment share is greater than the sector's share of the value added GDP is a clear indication that output per worker is lower than in non-agriculture. The difference ranges from 6- to 29-fold in countries such as Burkina Faso, Democratic Republic of the Congo, Rwanda, Burundi, Niger, Senegal, Uganda, Zambia, Malawi, Zimbabwe and Madagascar (Gollin, 2010). Bridging the productivity gap in agriculture could be an important antidote to poverty and inequality in agrarian economies and rural communities.

FIGURE 4.1 Rural poverty in Africa



Source: Author's computation from the World Development Indicators (accessed December 2016).

Several factors are rekindling interest in agriculture as an engine of economic development in Africa. The first is the rising recognition of the imperative of agricultural transformation in economic development, especially in generating decent jobs, creating wealth, promoting economic diversification,

generating foreign exchange earnings and driving economic growth. The second is that agriculture can serve as the linchpin of Industrialisation. The third is the sharp rise in food prices that started in 2008 and their persistence even during the period of primary commodity busts, which challenged the dire need to meet the hunger targets of the Sustainable Development Goals (SDGs) and the rising need to feed the rapidly growing urban population. Finally, the cases of China and India, where the successful implementation of strategies that focus on smallholders in the commercialisation of agriculture helped reduce poverty and, to some extent, inequality, present a strong argument in favour of investing in agriculture to drive economic development.

It is becoming increasingly clear that promoting an agriculture-for-development agenda is vital to achieve the SDGs in SSA, given the following: the sheer size of the agricultural sector, on which about three-quarters of the economically active depend; rural poverty of over 50 per cent in at least 33 countries; and that agriculture is the largest user of natural resources.

This chapter examines how agriculture has helped to shape poverty and inequality dynamics in Africa. To this end, the rest of the chapter is structured into four parts. Section 2 presents the current state of agriculture in Africa. Section 3 examines the relationship between agriculture, poverty and income inequality. Lessons for policy options are drawn in Section 4, while Section 5 concludes the chapter.

4.2 The current state of African agriculture

The current state of agriculture in SSA can best be understood by observing the proportion of the population that depends on it for livelihood. The reservoir of labour employed by agriculture makes it critical for development. Agriculture accounts for 66.0 per cent of total employment in SSA (excluding South Africa). This is exceedingly high compared to other developing regions such as Central America (21.0 per cent) and East Asia (54.0 per cent), and globally (41.0 per cent) (Gollin, 2010). However, the continental average tends to hide some peculiarities. As a result of structural transformation in countries such as Seychelles, South Africa, Mauritius and Algeria, the share of agriculture in total employment is less than 20.0 per cent; in fact, it is less than 5.0 per cent in Seychelles and South Africa (UNDP, 2012; Odusola, forthcoming). However, due to the rural nature of the economies and the weight of agriculture in the overall GDP, agricultural employment dominates overall employment – at over 70.0 per cent – in Burundi, Mozambique, Madagascar, Guinea, Rwanda, Uganda and Ethiopia.

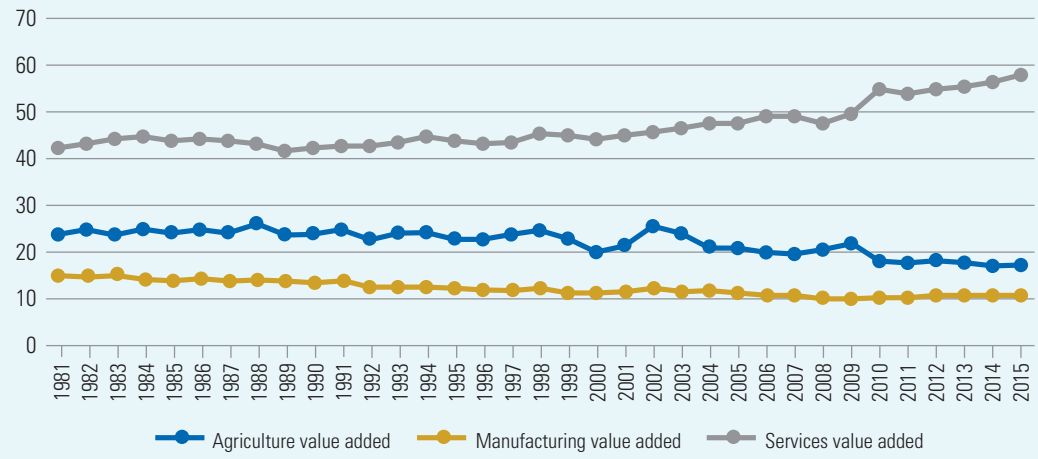
The gender composition of agricultural employment is also revealing. The proportion of men employed in agriculture is higher in West Africa (e.g. Burkina Faso, Mali, Togo, Niger, Nigeria, Benin and Ghana) and Southern Africa (Botswana, Namibia, Lesotho and South Africa) than in East and Central Africa. The proportion of women employed in agriculture is much higher in Burundi, Rwanda, Kenya, Republic of the Congo and Cameroon) (Odusola, forthcoming). This tends to suggest the role of agriculture in addressing gender inequality, poverty and inequality, especially in the distribution of agricultural assets (e.g. land) and inputs (e.g. fertilizers and improved seedlings).

The share of agriculture in total GDP has been declining gradually over the past four decades. SSA is second to South Asia in terms of contribution of agriculture to the overall economic activities – 17.5 per cent and 17.6 per cent, respectively – compared with Latin America and the Caribbean (5.3 per cent) and Organisation for Economic Co-operation and Development (OECD) member countries (1.6 per cent) (Odusola, forthcoming). The high share of agriculture in GDP reflects the fact that

agricultural transformation has not taken place in Africa and its potential is yet to be fully explored to serve as the engine of economic growth, the driver of income generation and the propellant of wealth creation. Africa has yet to benefit from the power of agriculture in driving growth and development as is being enjoyed in Latin America and the Caribbean, and East Asia and the Pacific (e.g. Byerlee, de Janvry and Sadoulet, 2009; World Bank, 2007; Ravallion and Chen, 2007).

Although agriculture's share of GDP has decreased by about 6.4 percentage points — from 23.9 per cent in 1981 to 17.5 per cent in 2015 (figure 4.2) — the structural transformation envisioned has yet to take place. During this period, the manufacturing sector, which was to benefit from the decline in agriculture if the much-awaited labour and investment reallocation proposed by Arthur Lewis and other scholars was to be realized, also fell by 4.31 percentage points. This further confirms the deindustrialisation process in Africa as illustrated by Odusola (2015), a process bolstered by unguarded deregulation and globalisation as well as institutional inertia. The losses in agriculture and manufacturing sectors were, instead, absorbed by the services sector dominated by informal activities. Due to the characteristics of the informal sector — low productivity, low income and poor working conditions — combined with the fact that it is being used to cope with poverty and unemployment in most SSA countries, it failed to use labour reallocation to initiate the much needed transformation. Indeed, SSA is bypassing structural economic transformation. This, again, offers a unique opportunity for the region to use agriculture to drive Industrialisation and propel growth and development through productivity enhancement.

FIGURE 4.2 Sub-Saharan Africa: Agriculture, manufacturing and services value added (% of GDP), 1981-2015

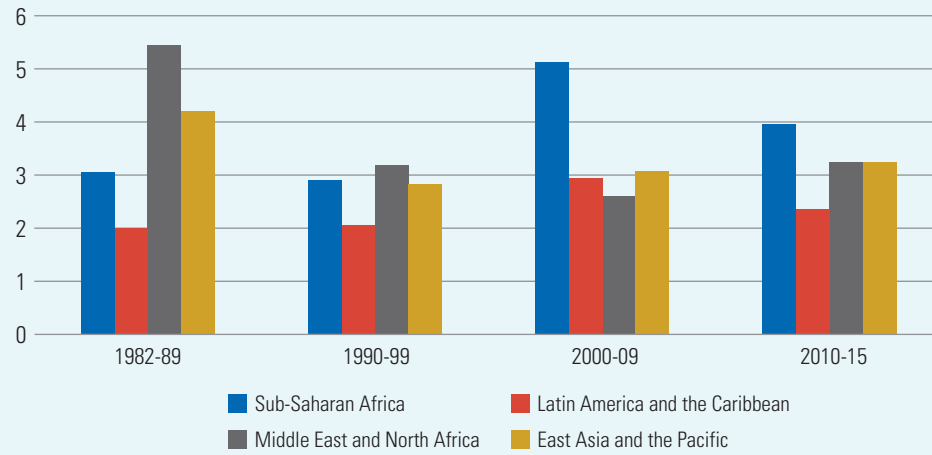


Source: Author's computation from the World Development Indicators (accessed December 2016).

Agricultural growth in Africa has improved over the past two decades. Contrary to the experience two decades prior to 2000 when agricultural growth in Africa lagged behind Latin America and the Caribbean, and East Asia and the Pacific, it has been outperforming these regions since 2000 (figure 4.3). Demand for food items has also increased due to Africa's population increase, especially among its youth. However, this growth is not due to agricultural productivity or farm intensification but, rather, to land expansion and implementation of the fallowing system. Again, Africa failed to

turn its potential as a global powerhouse into a development reality. Instead of using technological change to drive innovation and productivity in the sector and increase farm efficiency, African farmers resorted to cultivating part of the uncultivated 600 million ha of arable land (about 60 per cent of the global total) (Odusola, 2014).[3]

FIGURE 4.3 Growth rates of agriculture (%) by region



Source: Author's computation from the World Development Indicators (accessed December 2016).

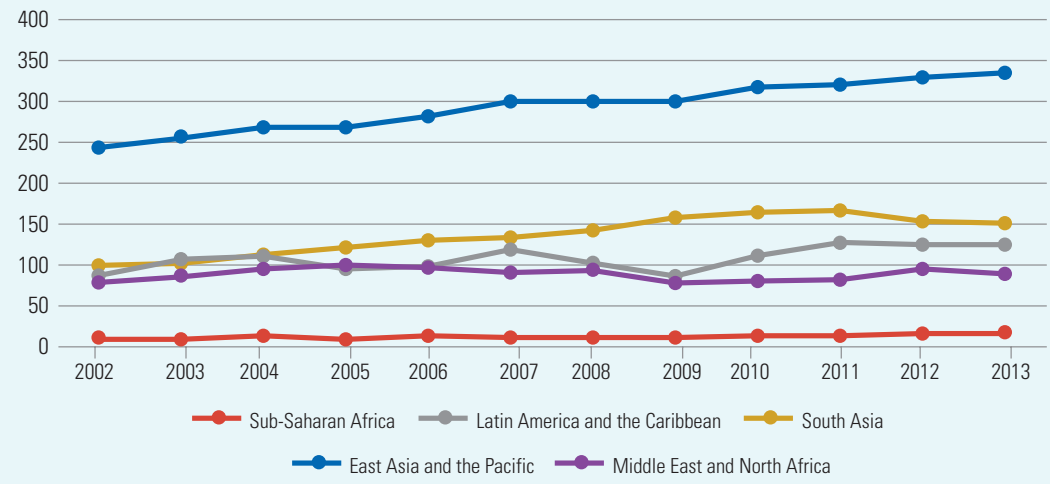
In spite of abundant fertile land and sparsely populated arable land, agricultural productivity per worker in Africa is the lowest across regions. For instance, during the 2005 to 2015 period, the annual average agricultural productivity per worker in SSA was $1,109.30 compared to OECD members ($19,540.80), Latin America and the Caribbean ($11,820.80) and the Middle East and North Africa ($5,394.90) (Odusola, forthcoming). Higher productivity, as argued by UNDP (2012), not only ensures food security, better nutrition and lower food prices, but it can also raise incomes of millions of smallholders, elevate living standards, and raise health and education, thereby increasing people's capabilities. With the adoption of relevant technologies and innovations, agricultural productivity can help promote food security, reduce food importation and propel improved stewardship of the environment, including land and water management services.

Boosting productivity requires an effective use of fertilizers, improved seedlings and improved access to irrigation facilities and extension service workers as well as more user-friendly fertilizers and water use. Poor performance in the use of fertilizers, which to a large extent is linked to limited access, explains the low agricultural productivity in Africa. Relative to other regions, SSA's performance on fertilizer use is dismal (figure 4.4). In 2013, for instance, SSA used only 5.1 per cent of the fertilizer per hectare used in East Asia and the Pacific and 11.5 per cent of that used in South Asia. Access to irrigation facilities is even poorer. In seven countries (Seychelles, Cabo Verde, Morocco, Tunisia, Algeria, Madagascar and South Africa), between 1.0 and 5.0 per cent of land was irrigated. In other African countries, less than 1.0 per cent of land was irrigated; the exception is Mauritius, where as

[3] Odusola (2014) argues that the large expanse of uncultivated fertile arable land accounted for the rising trend of land grabs in Africa.

much as 22.1 per cent of arable land was irrigated. The limited use of technology-based agricultural facilities explains, to large extent, why cereal yields in East Asia and the Pacific are close to 3.5 times greater than those of SSA and those of Latin America and the Caribbean are about 3.0 times greater. For instance, in 2010-2014, SSA's average yield of 1,421.8 kg per ha performed far below other regions: East Asia and the Pacific (4,809.1), Latin America and the Caribbean (3,998.7) and Europe and Central Asia (3,518.9).[4]

FIGURE 4.4 Fertilizer consumption per hectare of arable land (kg), 2002-2013, by region



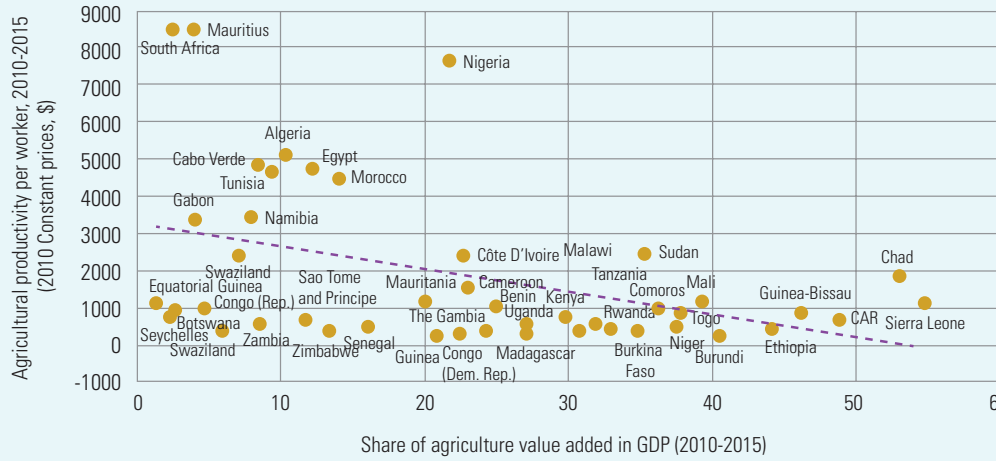
Source: Author's computation from the World Development Indicators (accessed December 2016).

Countries that succeeded in keeping productivity per worker to at least $3,000.00 per year also reduced their share of agricultural value added in GDP to less than 20 per cent. With the exception of Nigeria, countries with an agricultural share of GDP of more than 20 per cent have very low productivity per worker (figure 4.5). The goal of enhancing agricultural productivity is vital to promoting structural transformation that can promote the farm and non-farm rural economies, and the process of urban Industrialisation.

Several factors account for the poor performance of the agricultural sector in the continent, including limited adoption of technological change, institutional inertia, human capacity and weak political will. A comprehensive review of the production conditions in Africa and Asia by Karshenas (1995 and 2001) provides an explanation as to why SSA agriculture has been underperforming. Abundant land relative to labour and the small stock of man-made capital in African agriculture contrast with production conditions in Asia, which are characterised by scarce land, abundant labour and a relatively large agriculture capital stock, such as irrigation. This explains the low competitive non-farm wages in Asia compared to a high and steep non-agriculture wage rate in Africa. High population density, abundant labour and better infrastructure have enabled easier integration of agriculture into the national economy in Asia than in Africa.

[4] See the World Development Indicators, accessed in December 2016.

FIGURE 4.5 Agricultural productivity and value added in GDP



Source: Author's computation from the World Development Indicators (accessed December 2016).
Note: CAR= Central African Republic.

The urban bias of development policies in Africa has perpetuated an economic duality that has continued to drain agricultural surplus and productivity in many countries. The introduction of structural adjustment programmes in most African countries, where most development policies focused on urban development, led to the abandonment of rural development. This is further compounded by low investment in agriculture. In 2003, African governments adopted the Comprehensive Africa Agriculture Development Programme (CAADP), agreeing to spend 10 per cent of national expenditure on agriculture (the Maputo Declaration). As of 2013, however, only seven governments had consistently kept pace with the target (Burkina Faso, Ethiopia, Niger, Mali, Malawi, Senegal and Zambia), while countries such as Burundi, Republic of the Congo, Guinea, Ghana, Madagascar and Zimbabwe met the target once but could not sustain it (Bahiigwa and Benin, 2013).

Post-harvest losses are high in Africa. In 2011, the Food and Agriculture Organisation of the United Nations (FAO) estimated that as much as 37.0 per cent of food produced in SSA was lost between production and consumption. FAO also estimated 20.5 per cent of cereal losses and only 8.0 per cent of estimated losses due to post-harvest handling and storage. The African Post-Harvest Losses Information System (APHLIS) estimated between 10.0 and 12.0 per cent of post-harvest loss (World Bank, 2015). Evidence from Affognon et al. (2014) reveals that the inadequacies of loss assessment methodologies result in inaccurate post-harvest loss estimates. They also found that most available post-harvest loss estimates relate to on-farm storage, mainly of maize, yet many people in SSA rely on a variety of other staples, and post-harvest losses could also occur at various points on the supply chains. This is a clear indication of the need to conduct further assessments of post-harvest losses across the entire value chains of the various food commodities of nutritional importance to Africans. In addition, there is evidence that technologies for loss mitigation fail to address the dynamics of supply chains. Post-harvest losses increase with humidity, temperature and the construction cost of storage facilities. They decline, however, with better market access, post-primary education, higher

seasonal price differences, better production experience, technology efficiency, membership in farmers' associations, access to extension workers and improved storage practices (World Bank, 2015; Affognon et al., 2014).

The drivers of poor performance in Africa's agricultural sector are adequately captured in Binswanger and Townsend (2000), where four factors are indicated: (i) adverse resource endowments characterised by abundant arable land in the face of low population density and remoteness, which make agriculture transaction costs very high; (ii) poor policies and institutional failures; (iii) underinvestment and undercapitalisation; and (iv) adverse trade regimes of OECD countries, including restricted market access and price-distorting subsidies that render the agriculture of developing countries non-competitive. Tariff and non-tariff barriers to African agriculture and agro-industrial trade are high (ibid.). The high rate of agricultural taxation (through the price or the terms of trade mechanisms) is another impediment to the sector's growth and transformation. African agricultural products face dual tragedies: export taxation from African governments and import tariffs in destination countries (Lipton, 1987 and 2009).

Price incentive arguments often put forward in the literature cannot be applied to African subsistence farmers because of high transaction costs such as those due to the lack of market integration, poor infrastructure, prohibitive transport costs and high labour costs (Oyejide, 2008). Limited technological change in the agricultural sector has also contributed to low productivity in the sector. This is partly the result of underinvestment and undercapitalisation in agriculture by governments, the private sector and foreign investors.

Many African countries have signed several bilateral, regional and multilateral agreements that directly or indirectly hinder African agricultural products from accessing global markets. As pointed out by Oyejide (2008), African market access conditions are governed by a series of preferential trading arrangements that, in various ways, impact market access. In spite of these trading arrangements and agreements, the continent still faces market access impediments such as tariff peaks and tariff escalation, contingency measures, product standards, sanitary and phytosanitary standards (SPS), trade-distorting export subsidies, dumping practices and non-competitive primary commodity export market structures (ibid., 2008:4). Addressing these barriers should be the focus of policy attention, not only at the national and regional levels, but also at the global level.

Rapid ecological change is becoming a serious threat to prosperity in a region dominated by fragile ecosystems: about 75 per cent of SSA's surface area is dryland or desert; about 80 per cent of Africa's energy comes from biomass; and about 20 per cent of its GDP comes from rainfed agriculture. As of 2011, 20 African countries had been experiencing water shortage and 12 more countries will by 2035 (Juma, 2011). As suggested by Juma, Africa must strengthen its adaptive capacity by conserving its natural assets, building robust infrastructure, enhancing human capabilities and promoting entrepreneurship.

4.3 Agriculture, poverty and inequality: An overview of emerging issues from the literature

4.3.1 Theory

The literature is replete with early works that link agriculture to overall development through market-mediated frameworks.[5] Most of these studies (Lewis, 1954; Fei and Ranis, 1961) acknowledge the role of both the agricultural sector (the traditional sector) and the industrial sector (the modern sector) in the development process. These studies also see subsistence agriculture as a default source of employment and as a labour pool or reserve. The traditional sector is characterised by low wage rates, while the modern sector is characterised by a wage rate that is above the market-clearing level. The interactions of these two sectors, through the factor market, bring about an equilibrium wage rate in the economy. To this school of thought, the gradual absorption, by the modern (industrial) or the high productivity sector, of surplus labour in the traditional (agriculture) or the low productivity sector leads to poverty reduction.

Several scholars, such as Schultz (1964), Mellor (1995 and 1996) and Gollin (2010), argue that changes in technology, including better crop varieties and improved livestock, are important for transforming indigenous agriculture. In their view, accelerated agricultural productivity generates general equilibrium impacts that spur faster employment generation and equitable growth, with a resounding effect on societal wealth and stability. Some of these integrated impacts, as illustrated in Gollin (2010:3844), include: (i) an increase in farm income and profitability, leading to the improved welfare of farmers and the rural poor; (ii) a reduction in food prices, benefitting rural and urban consumers, including farmers who are net purchasers of food; (iii) a decline in nominal wages, consistent with an increase in real wages that allows the industrial sector to reduce costs; (iv) expansion in domestic demand for industrial goods; (v) better agricultural and industrial export competitiveness, resulting in improved foreign exchange earnings; and (vi) enlargement of the domestic industrial sector that helps to reallocate labour and investment from the agricultural to the industrial sector. Rapid modernisation of the agricultural sector through science-based technology that accelerates agricultural productivity is critical to maximizing these general equilibrium impacts.

The channels of transmission from agriculture to development have been highlighted extensively in six groups (Pingali, 2010): (i) providing labour for an urbanized industrial work force; (ii) producing food for expanding populations with higher incomes; (iii) supplying savings for investment in industry; (iv) enlarging markets for industrial outputs; (v) providing export earnings to pay for imported capital goods; and (vi) providing primary materials for agro-processing industries.

The Kuznets framework of the inverted U-shaped relationship between inequality and development hypothesizes that, at the initial stage of development, inequality increases as per capita income rises, largely as a result of an increase in the rural-urban inequality gap and inequality within urban sectors. Increased inequality is inevitable, based on the rise in urban Industrialisation and the mismatch in workers' pay rise and capital owner profits. However, this trend is reversed as many households benefit from the Industrialisation process, as well as the rise in rural wages due to increased demand for labour in agriculture and non-agricultural sectors in rural areas (Bourguinon and Morrisson,

[5] Some of these include Rosenstein-Rodan (1943), Lewis (1954), Johnston and Mellor (1961), Fei and Ranis (1961) and Schultz (1964).

1998; World Bank, 2007; Hazell, 2010; Estudillo and Otsuka, 2010). Foster and Rosenzweig (2003) also developed a theoretical model and empirical evidence on the distributional consequences of growth in the farm and non-farm sectors in India. They argued that the way in which an intervention increases the endowments of the poor or increases returns to the endowments that the poor possess is more important in determining how agriculture influences income inequality, especially in rural areas.

4.3.2 What does the literature say about the agriculture-poverty-inequality linkage?

The experience of developing regions in using agriculture to drive economic growth, modernize their economies and reduce poverty and inequality varies across countries. This section provides evidence from the literature on how agriculture has been driving development.

The World Development Report 2008 (World Bank, 2007) argues that agriculture is central to stimulating growth in other parts of the economy, overcoming poverty and enhancing food security in SSA (World Bank, 2007). This, however, depends on how countries accelerate the productivity revolution in smallholder farming, by: supporting smallholder farmers, including those in remote areas; promoting high-value products (e.g. vegetables and dairy); using agriculture to drive entrepreneurship and jobs in rural areas; and improving stewardship of natural resources, such as water management.

Estudillo and Otsuka (2010) provide insight into how South-East Asia has been able to use agriculture to reduce poverty and inequality. Many rural households in this region were able to move out of poverty through several processes. First, they raised income from rice production through enhanced access to land (including increasing the size of cultivated areas) and the adoption of modern technology (including improved access to irrigation pumps and improved seedlings), especially in the Philippines and Thailand. Second, they diversified incomes from farm to non-farm activities that stimulate non-farm employment opportunities for rural labour.

The implementation of the Green Revolution in South Asia, especially in Bangladesh and Pakistan, contributed immensely to poverty reduction, but countries have not performed well in reducing inter-household and interregional inequalities, possibly as a result of seasonal migration from less favoured to more favoured regions (Hazell, 2010). In South Asia, the harvested area under modern cereal varieties – i.e., rice, wheat and maize - which was almost zero in 1965, rose to 71.0 per cent, 94.5 per cent and 53.5 per cent, respectively, in 2000. This transformation was possible through enhanced budgetary allocation, improved research and development (R&D) in these targeted areas of development priorities, market liberalisation, and involvement of the private sector and civil society organisations (CSOs) in R&D and extension services. This approach generated more returns than rural development programmes alone.

Through a dynamic modelling of agricultural and non-agricultural sectors, Imai and Gaiha (2016) found that agricultural growth was more important in reducing poverty than inequality. In addition, the agricultural growth elasticity of inequality is weakened by ethnic fractionalisation, which tends to perpetuate inequality. This confirms the finding from Imai and Gaiha (2014) that agricultural growth is the most prominent factor in reducing poverty and inequality in developing countries.

Thirtle, Lin and Piesse (2003) show that, in Asia, a 1.0 per cent increase in crop productivity reduces the number of people in poverty by 0.46 per cent. Specifically for India, evidence from Ravallion and Datt (1996) shows that a 1.0 per cent increase in agricultural value added per hectare leads to 0.4 reduction in poverty in the short term and 1.9 per cent in the long term. They also found that growth

in the agricultural and tertiary sectors had a greater impact on poverty reduction than growth in the manufacturing sector. In addition, rural growth had a greater impact on poverty reduction than urban growth, due to higher farm productivity in some states.[6] Fan, Hazell and Thorat (2000) also observed that a 1.0 per cent increase in agricultural production in India reduces poverty by 0.24 per cent.

Also, in China, Ravallion and Chen (2007) estimated that agricultural growth contributed up to four times more to poverty reduction than growth from industry and service sectors due to favourable land distribution. These findings confirm earlier observations from Bourguinon and Morrison (2002), which conclude that increasing the level of productivity in traditional agriculture may have become the most efficient way of reducing inequality and poverty in many developing countries where relative labour productivity and land distribution played an important role in explaining income inequality, especially in the 1980s. Due to the strong forward and backward linkages between agriculture and the rest of the economy, agriculture had a high spillover effect on the rest of the economy. Evidence from Rangarajan (1982) shows that in India, a 1.0 percentage point addition to the agricultural growth rate generated an additional 0.5 per cent and 0.7 per cent to industrial output and national income, respectively.

Christiaensen, Demery and Kuhl (2006) reveal that poverty elasticity of agriculture is 2.3 times larger than that of the non-agriculture sector for low-income countries. For SSA, it is 4.25 times greater than that of the service sector. They conclude that agriculture is significantly more effective in reducing poverty among the poorest of the poor (using the $1 a day squared poverty gap) and as much as 3.2 times more effective at reducing $1 a day headcount poverty in low-income and resource-rich countries.

Pingali (2010) reiterates that investment in agriculture R&D in Africa has a much greater impact than any other public (non-research) spending. The long-term impact of agriculture R&D, especially on lower food prices, affects most urban dwellers, particularly in China and India where the urbanisation process has made great strides.

Using computable general equilibrium and micro-simulation models for South Africa, Herault and Thurlow (2009) find that removing distortions on agriculture products (such as tobacco, sugar, cotton, livestock and dairy products) will raise agricultural production, generate more jobs for low-skilled agricultural and food processing workers, and reduce poverty and inequality. They conclude that job losses in non-agriculture will be outweighed by job gains in agriculture. The positive net employment for formal and informal sector workers (0.83 per cent and 6.67 per cent, respectively) leads to welfare enhancement among rural workers and a substantial reduction in poverty ($2.0 per day) by 1.12 per cent nationally (1.32 per cent rural and 0.96 per cent urban). However, the reduction in income inequality is relatively small – 0.005 per cent nationally (0.004 per cent rural and 0.006 per cent urban).

Tschirley and Benfica (2001) show that in Mozambique, wage earnings are concentrated in the hands of well-off rural smallholders, which tends to increase inequality rather than reduce it. Education and previously accumulated household wealth remain the main determinants of beneficiaries. However, wages helped to reduce relative poverty, particularly among female-headed households.

The socioeconomic characteristics of farmers play an important role in determining the level of

[6] Agricultural growth is not the only solution to poverty reduction in India. Evidence from Foster and Rosenzweig (2004) suggests complementarity with rural, non-farm tradeable sector growth in the states that experienced slowest growth in agricultural productivity.

poverty and inequality in the society. Ayinde et al. (2012) reveal evidence from a case study of Ekiti State, Nigeria, that income inequality is higher in urban areas than in rural areas and higher among those engaged in agriculture than non-agriculture in both rural and urban areas. However, the level of income, farm size and household size impact inequality in both rural and urban areas.

Investment in sectors with backward and forward integration has a relatively higher potential to spur growth in other sectors of the economy. Nseera (2014) confirms this for Lesotho for the agricultural and textiles sectors, but finds that income distribution is substantially skewed against rural areas where the majority of the poor population live. Changing budget allocations to favour these sectors helps the country promote economic growth and accelerate poverty and inequality reduction, given the higher multipliers from agriculture and textiles.

Erickson and Vollrath (2004) focus on the relationship between land inequality and economic development. They find a strong relation between land inequality across agricultural populations and low levels of education provision.

Nielsen (1994) shows that the inequality-development relationship is explained by the spread of education, the demographic transition, generalised dualism (natural birth rate), labour force shifts and sectoral dualism. Sectoral dualism raises income inequality, whereas the percentage of the labour force in agriculture reduces it. Byerlee, de Janvry and Sadoulet (2009) also argue that despite rapid economic growth over the past two decades, the persistence of rural poverty in Africa shows the difficulty of redistributing incomes generated outside of agriculture and the deep inertia in people's occupational transformation as economies restructure.

Econometric evidence from other scholars also corroborates that the poverty-reducing effect of the rural economy is greater than that of the urban economy or other sectors.[7] The World Bank's (2007) decomposition analysis shows that 81.0 per cent of the global reduction in rural poverty during 1993-2002 can be linked to improvement in rural areas, while migration accounted for only 19.0 per cent. A 1.0 per cent GDP growth in agriculture raised the expenditure of the five poorest deciles by 3.7 per cent, whereas a 1.0 per cent GDP growth in the rest of the economy raised it by only 0.9 per cent (Ligon and Sadoulet, 2007). The evidence from Bravo-Ortega and Lederman (2005) also shows that an increase in overall GDP from labour productivity in agriculture is 2.9 times more effective in raising income of the poorest quintiles than the equivalent GDP rise from labour productivity from the non-agricultural sector. The poverty-reducing growth originated from incomes of small farmholders and wages of large-scale farm workers. Byerlee, de Janvry and Sadoulet (2009) also discuss the widening disparity between rural and urban dwellers in about 35 countries including India, China, Indonesia, Peru and Brazil, where urban incomes are about 80.0 per cent higher than rural incomes.

Limited inter-African trade is another impediment to agricultural growth and its linkage to overall development. Evidence from Pratt and Diao (2008) shows that there are ample opportunities for agricultural growth through regional linkages in Southern Africa. Due to close proximity, low- and middle-income countries are expected to benefit from regional production, productivity, trade and investment if regional integration is focused on agricultural products.

[7] For a comprehensive review of these papers and on the significant role of incomes from agriculture in rapidly reducing poverty in China, Viet Nam and India as well as on its little impact of income from agriculture in Bolivia, Peru and Brazil, where growth is concentrated on export-oriented sectors, see Byerlee, de Janvry and Sadoulet (2009).

The role of agriculture is better understood within the context of a broad-based development approach. As argued by Byerlee, de Janvry and Sadoulet (2009), when agriculture receives due attention and priority, it plays an invaluable role as a major source of product, factor and foreign exchanges; contributes to industrial growth; and facilitates reduction in poverty and income disparities. However, the context in which these roles are carried out is influenced by a number of factors, such as globalisation, rapid technological change, institutional innovations and environmental constraints. Maximizing these multi-dimensional functions requires a paradigm shift that focuses on overcoming anti-agriculture biases, strengthening agricultural sector governance and prioritizing agriculture functions in relation to each country's context.

Increasing the proportion of land held by the poor not only increases their incomes, but their power and status as well. In fact, Lipton (2009) argues that land is the main productive asset of the poor. Poor people's access to land is not only critical to agricultural transformation, but also to raising the poor's incomes through farm labour income, income from land either through renting or owner farming, income from farm enterprises, non-farm income, and the economy-wide effect of land access that skews growth towards the small-scale or landless farmers. Land concentration in developing countries not only increases inequality, but also reduces farm outputs and economic growth. Griffin, Khan and Ickowitz (2001) also argue that improved land distribution in China led to enhanced farm income with an equalising effect on the overall income in the country. Lipton (2009) also observed that poverty and landlessness in South Africa and Bolivia are concentrated among rural dwellers. Land redistribution has contributed to a rapid reduction in poverty incidence in Latin America and Asia, especially in China and Viet Nam (Lipton, 2009). The lack of secure tenure and ownership hinders major investment in land improvement and water management. Land ownership and registration enhance poor people's participation in the land legal system by allowing them to participate in and benefit from the land market system (Manji, 2006). It also increases rural credit markets, which further helps the poor to cross the poverty line and increase their wealth.

Improved land ownership is required to use agriculture to reduce poverty among rural households, reduce income inequality between the poorest and the richest fifth and dent horizontal inequality (particularly among women, certain tribes and remote communities) (Agrawal, 1994; Stewart, 2008; Lipton, 2009).

4.4 Model specification and analysis of empirical findings

4.4.1 Model specification and data description

The literature review above provides the framework for specifying the relationship between poverty or income inequality and agriculture. The model specification follows the theoretical frameworks examined in Section 4.3. The analytics developed by Lewis (1954), Schultz (1964) and Kirkpatrick and Barrientos (2004) provide the channels and transmission mechanisms through which agriculture affects development, especially poverty and income inequality. They work through resource allocation from the labour-abundant sector (agriculture) to the labour-scarce sector (industry). The unlimited supplies of labour from agriculture allow capital accumulation to be sustained over time in the industrial sector.

When surplus labour in the agricultural sector is exhausted, wages in the sector begin to rise. This development bridges income disparities between agriculture and the rest of the economy.

The elimination of surplus labour in the agricultural sector generates innovations that promote productivity enhancement. This pushes wages in the industrial sector upwards and reduces profit levels; at this point, income disparities between workers and capital owners narrow. The process of capital accumulation slows down. Increase in demand for labour leads to an increase in returns to human capital. Moreover, the decreasing importance of farming in household incomes leads to the growth of non-farm activities, especially in communities where agricultural conditions are unfavourable (e.g. Johnson and Mellor, 1961; Mellor, 1995 and 1996; Gollin, 2010). Therefore, the transformation in the agricultural sector leads to a reduction in poverty and income disparities.

The variables that serve as proxies for this transformation include agricultural value added and employment in both the agricultural and the industrial sectors. Human capital is proxied by secondary education. Estudillo and Otsuka (2010) predict an inverse relationship between education and poverty, while Lindert and Williamson (1985) predict a curve-linear relationship.

The transmission mechanism through which reallocation of labour away from agriculture affects poverty and income inequality is captured by sectoral dualism, as explained by Nielsen (1994) and Estudillo and Otsuka (2010). It is defined as the per cent of the labour force in agriculture minus the share of agriculture in GDP (Nielsen, 1994). Sectoral dualism, an indicator of shifting the labour force away from agriculture and a gauge for determining the average income difference between sectors, is expected to increase and decrease inequality as the economy develops. Shifting labour away from the agriculture sector could lead to an ambiguous relationship, depending on the net effect on agriculture and industrial sectors. GDP per capita and total factor productivity have negative impacts on poverty, but a positive impact on income inequality (Nielsen, 1994; Hazel, 2010; Mellor, 1995 and 1996).

The model is based on a panel dataset of 39 African countries[8] using the ordinary least squares (OLS) technique to estimate the various parameters. The model is run on 39 data points. All data except total factor productivity were sourced from the World Bank's World Development Indicators and the Food and Agriculture Organisation of the United Nations' (FAO) databases, while the total factor productivity was obtained from the United Nations Industrial Development Organisation's (UNIDO) database. All variables are in logarithmic form. The averages of rural poverty; the rural poverty gap and Gini (2000-2013); share of employment in agriculture, industry and services as a percentage of total employment (2005-2015); agricultural value added per worker (2010-2015); agricultural value added (2010-2015); adolescent births per 1,000 live births (2000-2015); access to electricity (2000-2012); secondary school enrolment (2000-2013); total factor productivity (1990-2010) and control of corruption (2005-2010) are used.

The explanatory variables are as indicated in equation (1) below. A sensitivity analysis on the impact of agricultural variables is also used.

$$Yi = ß_0 + ß_i X_i + \mu \qquad (1)$$

Where: Yi is the vector of dependent variables (rural poverty, rural poverty gaps and Gini coefficient). Xi are the independent variables: share of agriculture employment in total employment; share of industry employment in total employment; share of services employment in total employment;

[8] These countries are Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cabo Verde, Central African Republic, Chad, Comoros, Republic of the Congo, Democratic Republic of the Congo, Côte d'Ivoire, Ethiopia, Gabon, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Senegal, Sierra Leone, South Africa, Sudan, United Republic of Tanzania, Togo, Uganda, Zambia and Zimbabwe.

agricultural value added per worker; agricultural value added; adolescent births per 1,000 live births; access to electricity; sectoral dualism; secondary school enrolment; total factor productivity and control of corruption. Several sensitivity analyses and robustness checks were conducted on the regression results.

The credibility of a multivariate model is determined by the lack of multicollinearity bias. To avoid multicollinearity in equation (1) specified above, the variance inflation factor (VIF), generally defined as $(1/(1-R^2)$, is applied.[9] The rule of thumb is that a VIF greater than 10 exhibits signs of serious multicollinearity and should be corrected. Where multicollinearity bias was found, such models were re-specified to eliminate the bias.

4.4.2 Analysis of empirical findings

Bivariate and multivariate analyses are used to determine the role of agriculture and other variables in influencing the dynamics of poverty and inequality in Africa. The effect of activities in the agricultural sector on employment, rural poverty and income inequality is examined below.

4.4.2.1 Impact on employment

Table 4.1 shows the impact of agricultural productivity on employment. At the bivariate level, agricultural value added tends to pull employment into the sector, with some tendency to reduce inequality and rural poverty gaps. Agricultural productivity per worker, in contrast, tends to push labour out of the sector with a correlation index of between 0.54 and 0.58 for male and female employment in agriculture, respectively (table 4.2). To avoid multicollinearity bias, and based on the signal from the VIF, agricultural productivity per worker was excluded from the multivariate analysis. Special attention was given to its impact on overall employment in the agricultural, industrial and services sectors. Agricultural productivity pushes workers out of the sector with the highest impact for women (table 4.1). This is not surprising. As productivity per worker increases, less labour is needed in the agricultural sector. More labour is absorbed in these sectors, resulting from the backward and forward linkages with the services and industrial sectors. Enhanced productivity in the agricultural sector is an important factor in labour reallocation to other sectors of the economy. A major policy consideration is the need to enhance agricultural productivity in order to encourage labour reallocation to the services and industrial sectors.

TABLE 4.1 Impact of agricultural productivity on total employment in SSA

Variables	Model statistics			
	Intercept	Coefficients (t-statistics)	R^2	F-Statistics
The agricultural sector's share of female employment	2.775*	-0.369 (-4.071)*	0.309	16.569*
The agricultural sector's share of male employment	2.446*	-0.257 (-3.466)*	0.245	12.013*
The agricultural sector's share of total employment	2.524*	-0.281 (-3.692)*	0.269	13.635*
The industrial sector's share of total employment	0.531***	0.157 (1.792)***	0.079	3.210***
The services sector's share of total employment	0.887*	0.205 (3.098)*	0.206	9.597*

Source: Author's computation.
Note: * and *** significant at 1 and 10 per cent, respectively.

[9] For a detailed description of the processes required for the computation of VIF, see Kutner, Nachtsheim and Neter (2004).

TABLE 4.2 Correlation Index between variables of interest

	Gini	RPG	RP	AFE	AME	ATE	ITE	STE	AVA	AVApw	SD	AE	AFR	SSE	CC	GDPpc	TFP
Gini	1.00	0.39	0.23	-0.07	-0.08	-0.09	0.02	0.10	-0.30	-0.07	-0.26	-0.05	-0.03	0.16	0.33	0.23	0.12
RPG		1.00	0.75	0.00	-0.04	-0.05	-0.04	-0.08	-0.38	0.01	-0.40	-0.08	-0.15	-0.02	-0.18	0.13	-0.11
RP			1.00	0.57	0.55	0.56	-0.46	-0.31	0.08	-0.34	-0.31	-0.57	-0.12	-0.55	-0.41	-0.39	-0.69
AFE				1.00	0.90	0.96	-0.72	-0.73	0.41	-0.58	-0.24	-0.68	-0.03	-0.76	-0.47	-0.64	-0.71
AME					1.00	0.99	-0.77	-0.77	0.43	-0.54	-0.24	-0.78	0.00	-0.81	-0.44	-0.72	-0.80
ATE						1.00	-0.78	-0.78	0.43	-0.56	-0.24	-0.76	-0.01	-0.82	-0.48	-0.71	-0.79
ITE							1.00	0.80	-0.38	0.39	0.14	0.74	-0.13	0.67	0.42	0.63	0.55
STE								1.00	-0.36	0.47	0.17	0.64	-0.13	0.67	0.29	0.69	0.54
AVA									1.00	-0.41	0.77	-0.36	0.12	-0.34	-0.28	-0.62	-0.28
AVApw										1.00	-0.04	0.45	-0.03	0.41	0.26	0.40	0.46
SD											1.00	0.16	0.13	0.22	0.04	-0.16	0.27
AE												1.00	0.13	0.75	0.31	0.76	0.64
AFR													1.00	-0.01	0.16	-0.06	0.12
SSE														1.00	0.58	0.64	0.70
CC															1.00	0.34	0.63
GDPpc																1.00	0.63
TFP																	1.00

Source: Author's computation.

Note: RPG = rural poverty gap; RP = rural poverty; AFE = share of agriculture in female employment; AME = share of agriculture in male employment; ATE = share of agriculture in total employment; ITE = share of industry in total employment; STE = share of services in total employment; AVA = share of agriculture value added in GDP; AVApw = agriculture value added per worker; SD = sectoral dualism; AE = access to electricity; AFR = adolescent fertility rate; SSE = secondary school enrolment; CC = control of corruption; GDPpc = GDP per capita; TFP = total factor productivity.

4.4.2.2 The impact on inequality and rural poverty

The role of agriculture in driving development is not only determined by the level of employment it generates or its contribution to the value added GDP, but also by its influence on poverty and inequality. While recognizing the pervasive role of agriculture on development, i.e., in affecting the rural and urban population, the focus of analysis on poverty is on the rural population, largely because that is where the bulk of agricultural activities take place. Due to the low wages and meagre incomes associated with their status as the reservoir of surplus labour, many people working in the sector fall below the poverty lines. Agriculture's shares of female, male and total employment tend to have a positive correlation with rural poverty. The positive relationship between agriculture's share of total employment and rural poverty is established to be statistically significant, at 95 per cent confidence interval. In fact, a 1.0 per cent increase in the share of agriculture in total employment raises rural poverty by 0.14 per cent (table 4.3). This explains why the sector tends to employ a high proportion of poor people in the continent, as explained by Lewis (1954) and Fei and Ranis (1961). Agricultural employment contributes to rural poverty partly because of the predominance of subsistence farming. Most Africans see farming as a way of life, rather than as a business enterprise. Understanding agriculture as a business enterprise will not only increase productivity, but will also increase decent incomes, rural well-being and food security. Employment in agriculture helps to reduce rural poverty gaps, but it does not have any significant impact on inequality.

The role of sectoral dualism in driving the inverted U-shaped development-inequality relationship has long been acknowledged by Kuznets (1955). Evidence from the bivariate analysis shows that sectoral dualism tends to have a negative correlation with rural poverty, the rural poverty gap and inequality (table 4.2). It also tends to reduce employment in agriculture for male, female and total employment. Although shifting labour away from agriculture to other sectors of the economy is expected to reduce rural poverty and the rural poverty gap, this is established only for rural gap. For example, a 1.0 per cent shift leads to a 0.282 per cent reduction in the rural poverty gap, but a 0.071 per cent rise in rural poverty. This suggests that most of the workers who moved out of the sector are relatively well-off, particularly those with secondary education.

The endemic rural poverty gap is becoming a serious development concern because it accentuates rural poverty. For example, a 1.0 per cent increase in the rural poverty gap increases rural poverty by about 0.7 per cent (table 4.3). This strongly established relationship is a major argument for rethinking policy direction if rural poverty is to be addressed. Scaling up rural income by diversifying the rural economy and implementing social protection programmes will help reduce the rural poverty gap and overall rural poverty. The rising wave of social protection programmes across many African countries, such as South Africa, Ethiopia, Rwanda, Malawi, Senegal, Ghana, Burkina Faso and Nigeria, among others, should be strengthened and should target the extremely poor. It should also be conditional upon core development targets, such as sending girls to school and encouraging pregnant women to participate in ante-natal and post-natal services, which could further enhance the effectiveness of such programmes.

TABLE 4.3 Impact on inequality and rural poverty in SSA

Rural poverty, rural poverty gap and inequality as the dependent variables

Variables/model statistics	Rural poverty	Rural poverty gap	Inequality
Intercept	0.676 (2.875)*	0.586 (0.384)	1.687 (5.889)*
Share of agriculture in total employment	0.141 (2.097)**	-01783 (-1.874)***	0.040 (0.568)
Share of services in total employment	0.107 (1.416)		
Sectoral dualism	0.071 (2.317)**	-0.282 (-1.870)***	
Secondary school enrolment	-0.126 (-2.072)**		
Rural poverty gap	0.672 (21.776)*		0.456 (3.540)*
Control of corruption		-0.099 (-0.826)	0.038 (1.624)***
Share of agriculture value added in GDP			0.031 (0.828)
GDP per capita		-0.405 (-2.017)***	0.060 (1.414)
Rural poverty			-0.522 (-2.790)*
Gini		1.628 (2.602)**	
Total factor productivity		-0.270 (-0.329)	
Share of agriculture in female employment		1.236 (1.962)***	
R^2	0.946	0.409	0.510
F-Statistic	115.185*	3.058**	5.559
Variance inflation factor (VIF)	9.483	1.200	1.352

Source: Author's computation.
Note: *, ** and *** significant at 1, 5 and 10 per cent, respectively.

Education is power. The role of secondary school education in shaping development dynamics is evident. At both bivariate and multivariate levels, it is a veritable tool to reduce rural poverty (tables 4.2 and 4.3). At the bivariate level, the correlation coefficient is -0.55. This relationship is statistically established at the multivariate level. For instance, a 1.0 per cent increase in secondary school enrolment reduces rural poverty by 0.13 per cent. This relationship is also statistically established at a 95 per cent confidence interval. It also tends to play an important role in reallocating labour away from the agricultural sector (with a correlation coefficient ranging from -0.76 to -0.82) and to push resources to the industrial and services sectors (with a correlation coefficient of 0.67). Education is likely to help promote structural economic transformation since secondary education helps to reduce the share of agriculture in value-added GDP. This result confirms findings from the World Bank (2015) and Affognon et al. (2014) that education helps to enhance technology adoption and reduce post-harvest losses.

Other important drivers of the rural poverty gap are also noted. GDP per capita and shifting labour away from agriculture (sectoral dualism) help to reduce the rural poverty gap – both significant at a 5.0 per cent level. However, women's employment in agriculture and the level of inequality are impediments to addressing rural poverty gaps. Low wage rates for women is one of the factors that widen rural poverty gaps; addressing income inequality is a development imperative because it helps to narrow them.

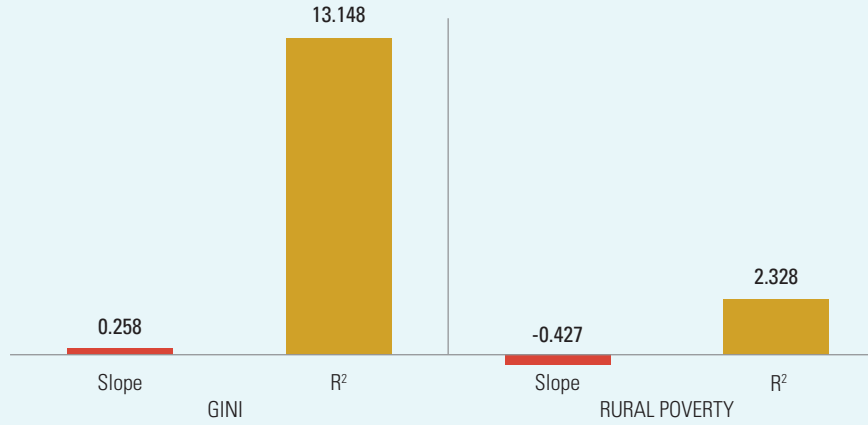
4.4.2.3 The role of total factor productivity

The role of total factor productivity is similar to that played by education. It has a negative effect on rural poverty and a positive relationship with inequality (table 4.2). The relationship is statistically established at 1.0 per cent level of significance (figure 4.6). Indeed, total factor productivity alone explains about 13 per cent of variations in income inequality. Each country's performance on total factor productivity and income inequality is shown in Odusola (forthcoming). For instance, four of the seven countries (Seychelles, South Africa, Botswana and Namibia) with a total factor productivity index of greater than 0.40 had a Gini coefficient of more than 0.55.[10] Mauritius and Tunisia performed well on both indicators, with a Gini coefficient of less than 0.36. They always accompany their productivity enhancement with effective social protection for the marginalised, especially those persons who do not benefit from increased productivity. In contrast, of the 29 countries that recorded a total factor productivity of 0.20 and below, 24 (about 82.7 per cent) had a Gini coefficient of less than 0.50.

Figure 4.7 shows the relationship between poverty and total factor productivity in Africa. The coefficient of determination of 0.51 is very high. Eight of the 10 countries with the lowest poverty rates in the region (less than 20 per cent) had a total factor productivity index of 0.30 and above. In contrast, most countries with a high poverty rate had a total factor productivity index of less than 0.30. This confirms the findings from CSLS (2005) that productivity explains changes in poverty better than economic growth alone. African countries should give priority to boosting their national and sectoral productivity to accelerate rural poverty reduction.

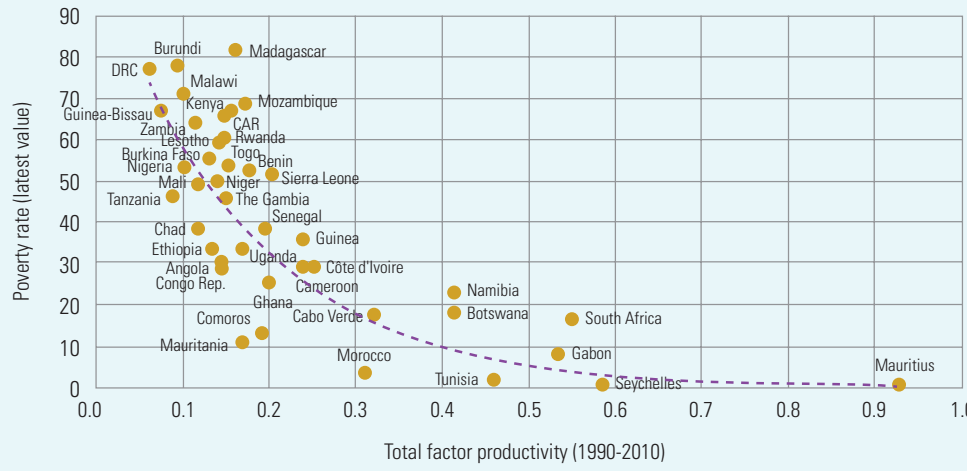
[10] The other countries are Tunisia, Mauritius and Gabon. See Odusola (forthcoming) for detailed information on the relationship between total factor productivity and Gini coefficients across African countries.

FIGURE 4.6 Impact of total factor productivity on inequality and rural poverty



Source: Author's computation from the World Development Indicators (accessed December 2016).
Note: The relationship is established at 1.0 per cent level of significance for both variables – at bivariate level only.

FIGURE 4.7 Correlation between national poverty and total factor productivity



Source: Author's computation from the World Development Indicators (accessed December 2016).
Note: DRC=Democratic Republic of the Congo and CAR=Central African Republic.

4.5 Emerging lessons for policy options and conclusions

4.5.1 Emerging lessons for policy options

The agriculture-for-development agenda, which should be prioritised, calls for a paradigm shift that emphasises overcoming domestic and foreign anti-agriculture biases in the context of national development strategy. In addition, strengthening governance of the agriculture sector, with particular

attention to small- and medium-scale farmers, better access to agricultural land and improved access to water and irrigational management are critical if agriculture is to drive growth and development.

How growth is achieved is significant for poverty reduction and income disparities. To ensure that agriculture meets the short-, medium- and long-term objectives of growth expansion as well as poverty and inequality reduction, its transformation should focus on enhancing the productivity of small and medium farmholders, including technology adoption that meets the needs of excluded or marginalised farmers. Such agricultural productivity-induced strategies have a transformative impact on rural areas by strengthening off-farm activities, raising rural employment and improving rural wages (Pingali, 2010), with direct and indirect impacts on poverty and inequality reduction. Deepening agricultural intensification by adopting modern technology, including R&D and extension services, is significant for agricultural transformation.

Imposing ideas, approaches and technologies on farmers without their adequate involvement in the planning, formulation and implementation of agricultural policies is a recipe for failure (Siqwana-Ndulo, 2007:21). Involving rural farmers in the planning and implementation of agricultural policies and programmes is an important lesson. To pursue the agriculture-for-development agenda, local, national and global agricultural governance requires urgent and rapid improvement. The state's capacity to formulate and implement agriculture-for-development policies needs substantial improvement to coordinate across sectors and to form partnerships with private sector and civil society actors, as well as development partners.

Improvements in policies, institutions and public expenditures are vital to accelerate agriculture and rural economic transformation, as well as to reduce rural poverty and income disparities. These improvements include promoting sound macroeconomic policies targeted at agricultural sectors, such as a stable exchange rate and a single-digit lending rate to agriculture, and promoting strong prevention and control of corruption. Ensuring predictability and credibility of policies, processes and rules is crucial to progress, as is strengthening the capacity of the state and the private sector to ensure this. Strategies that encourage competition and incentivize the private sector to invest and engage in agriculture are another factor. Strengthening natural resources management (e.g. land and water) helps to promote sustainability of impact.

Increasing budgetary allocation and the effective utilization of such resources help bridge knowledge, information and infrastructure gaps in agriculture. It is essential to mobilise resources for agricultural and rural development from the public and private sectors, as well as from domestic and foreign sources, and build strong partnerships between the public and the private sectors. On-farm investment by farmers and private sector actors should focus on inputs, livestock, soil management, farm machinery, capital, irrigation and human capital. In addition to establishing farm settlements, national and sub-national governments should also focus on investment relating to transport infrastructure, electrification, communication, water supply, irrigation, extension services, post-harvest management and R&D focusing on sciences, technology and innovations. Development partners should dedicate a large proportion of their support to agriculture and rural development.

The role of the international community is central to breaking away from low elasticity of demand for basic agricultural commodities in Africa. This includes addressing tariff and non-tariff barriers against agricultural and agribusiness products, improving market access in OECD countries, including trade-disruptive subsidies and developing instruments to cope with price fluctuations of agricultural commodities.

Agricultural productivity and innovations driven by strong institutions that help create and disseminate best practices and technological breakthroughs in Africa are key. Notwithstanding the improvement in communication system, geography still plays a significant role in achieving a critical mass in agricultural innovations. The promotion of cluster farming or farm settlements is a good example and could usher in transformative economic growth poles across many African countries, as was carried out in the 1960s in western Nigeria. It also has the tendency to attract youth into the sector.

It is evident that the reallocation of labour from the agricultural sector to the other sectors is not automatic. The share of agriculture value added is a magnet that keeps labour in the sector (a pull factor), whereas agricultural productivity pushes labour out of the sector (a push factor). For African governments to effectively encourage labour reallocation to the industrial sector, where income is high enough to push people out of poverty, policy attention should focus on productivity enhancement. Several strategic actions for productivity enhancement include: improving access to fertilizer and its usage; expanding irrigation facilities; promoting non-tillage farming; accessing farming inputs, improved seedlings, herbicides and insecticides; and promoting access to affordable credit. Proactive policy attention should be given to post-harvest assessment and management. This should go beyond concentrating on on-farm storage losses and on maize-only losses to the entire value chains of the various agricultural produce of nutritional significance to Africans. Approaches that focus on wide-ranging and far-reaching user participation in the dissemination, management and application of post-harvest knowledge, as well as support to post-harvest management technology, should be encouraged.

Most policies that help to reduce poverty may not necessarily assist in reducing income inequality. Both post-secondary education and total factor productivity are vital to poverty reduction, but in most cases, they accentuate income inequality. Promoting broad-based strategies, including improving education, expanding employment opportunities and deepening complementary social protection programmes for the marginalised are vital for addressing the divergence between poverty and inequality. Strategic efforts to promote climate change adaptation in terms of drought-resistant seedlings and climate-resistant animal breeding, as well as scaling up investment in agricultural R&D, are critical to moving forward.

4.5.2 Conclusions

Agricultural productivity per worker in Africa is the lowest across developing regions. This is largely accounted for by low fertilizer use and limited access to irrigation facilities. Several factors account for the poor performance of the agricultural sector: limited adoption of technological change; urban bias development policies; institutional inertia; poor investment in agriculture; weak human capacity and political will; high agricultural tax rates; and Western nations' adverse trade regimes. Enhancing agricultural productivity should remain a central policy agenda for the African governments to promote structural economic transformation.

This chapter calls for an agricultural renaissance – a deeper understanding and renewed commitment to the fundamental role of agriculture in the overall development process, especially as it relates to long-term economic growth and poverty and inequality reduction. Promoting the agriculture-for-development agenda requires: fast-tracking the productivity of smallholder farming by supporting smallholder farmers to access land, farm inputs and post-harvest facilities, including those in remote

areas; investing in post-harvest management; promoting high-value products such as vegetables and dairy products; using agriculture to drive entrepreneurship and jobs in rural areas particularly non-farm activities; and improving management of natural resources, including land and water. Agricultural productivity is an important factor in labour reallocation to other sectors of the economy. In this regard, promoting access to fertilizer, expanding irrigational facilities, promoting non-tillage farming and investing in agricultural R&D are pivotal to promoting agricultural productivity that could help link agriculture to poverty and inequality reduction in Africa.

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