
Chapter 1

West Africa staple food systems: An overview of trends and indicators of demand, supply, and trade*

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*Correct citation: Elbehri, A., J. Kaminski, S. Koroma, M. Iaftrate, and M. Benali (2013), ***West Africa food systems: An overview of trends and indicators of demand, supply, and competitiveness of staple food value chains***, In: *Rebuilding West Africa's Food Potential*, A. Elbehri (ed.), FAO/IFAD.

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1. Introduction

The food price crisis of 2007/08 provided the needed jolt to West African governments, and elsewhere among developing countries, to stimulate a new impetus toward staple foods, characterized by: (i) renewed interest in investments targeting staple food value chains; (ii) a recognition of the importance of considering the whole value chain, including post-production phases; and (iii) an awareness that effective staple food value chains require the active involvement of both the public sector and private entrepreneurs, as well as strong and credible producers' organizations playing their roles.

Economic studies on staple value chains in West Africa are relatively sparse and only of recent vintage, having been done mostly in the aftermath of the food price crisis of 2007/08. Moreover, existing studies tend to be uneven, with relatively more work reported for highly-traded commodities like rice; significantly less is known about major import-substitution staples of the region, especially sorghum, millet and cassava. This volume attempts to close this information gap and to offer a comprehensive and even-handed analysis on a wide range of staple food systems that are among the most important for the region.

Staple food crop development presents a number of challenges, given the large numbers of small farmers involved, the weak mobilization of stakeholders, poor soils and seeds and the inadequate capacity of smallholder farmers. Staple crops, especially cereals, roots and tubers, can either be stored or directly consumed on-farm, as well as directed to various market outlets. In West Africa, staple foods currently require significant upgrading of the agroprocessing capacity, including better coordination strategies between farmers and agroprocessors. Yet investments in staple food value chains continue to be hampered by the perception of low incentives and higher risks for farmers and private agribusiness actors. Such challenges require tackling problems related to the general business environment, weak or inefficient contract enforcement, infrastructure deficit and diffusion of agricultural research. In addition, building long-term competitiveness in staple foods is problematic, as soil fertility is a serious and worsening problem, while returns to labour are relatively low. Given the low productivity and competitiveness of the staple foods in general, there is still a huge scope for yield and efficiency improvements and for further reductions in unit costs. Clearly there is a case for active public and private engagement, yet the real question is how, and under what institutional set-up, this can be achieved, given the specificities of the staple food systems.

Developing staple food value chains requires fresh thinking and a different *modus operandi* than is used for export commodities (cotton, coffee, cocoa). Demand drivers for staple food commodities (cereals, roots and tubers, oilseeds and livestock products) are domestic, and can vary from local to regional in scope. Staple food commodities present particular development challenges, as they involve a large and highly heterogeneous number of small-scale producers, where women are often important players in production, trading and small-scale agroprocessing. Consequently, staples require quite different development models compared with those that prevail for traditional export commodities.

Policy priorities for rebuilding the productive capacity of West Africa's agriculture can start by expanding the knowledge base on staple value chains in West Africa, ensuring appropriately targeted public sector investments combined with private sector engagement to enhance competitive systems, and promoting smallholder inclusion in the value chain by enhancing the roles and capacities of producers' organizations.

In this introductory chapter, we provide a brief overview of the key indicators and drivers affecting demand and supply of staple food value chains in West Africa. Following this Introduction, Section 2

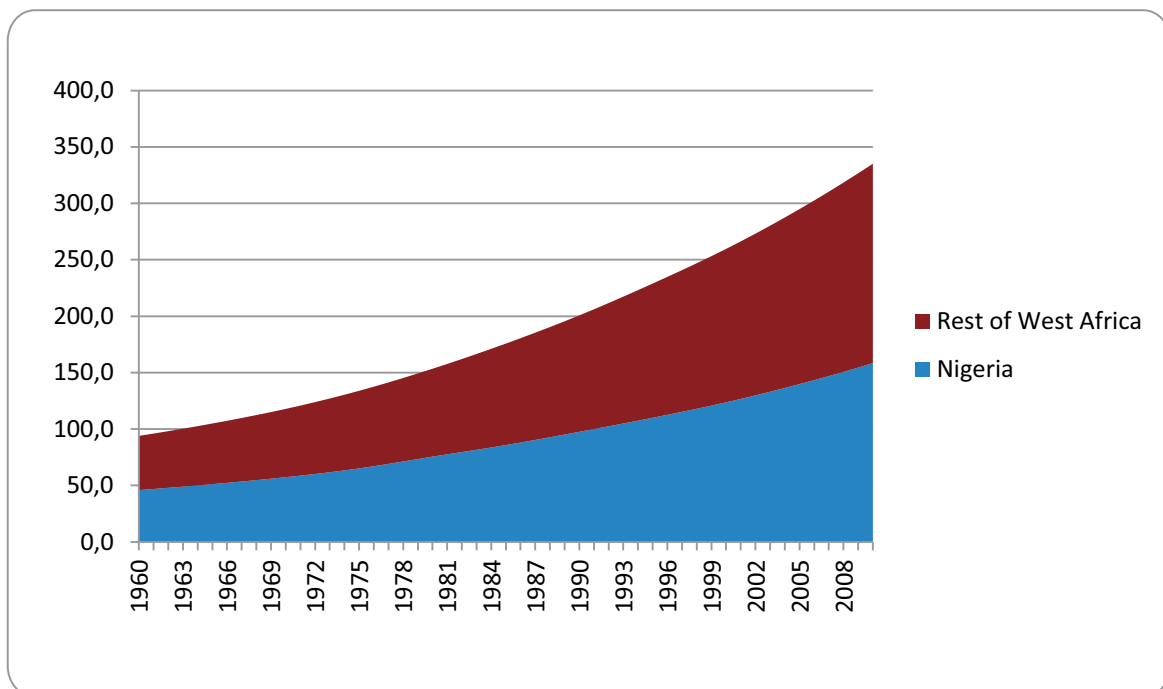
reviews the demand drivers affecting current and future food demand in West Africa, especially the critical roles of population growth and rapid urbanization of the region. The section also succinctly reviews broad highlights of staple food utilization, consumption patterns and overall demand. Section 3 reviews food supply drivers and summarizes some of the key productivity indicators, such as yield, land use and soil fertility. Section 4 addresses food trade, which fills the gaps between demand and supply. This section distinguishes between formal trade flows and the informal trans-border trade within West Africa, which is very important and has only recently begun to be documented. Section 5 reviews a number of salient issues specific to some of the major staple food value chains in the region, providing an introductory preview of the more detailed treatments in the case studies that appear later in this volume.

2. West Africa's staple food situation: A review of demand drivers

2.1 Population and urbanisation trends

Since 1960, when most West African countries were gaining independence, the total population of the region (including Cameroon and Chad) was just over 90 million but in the course of 50 years the population nearly quadrupled, reaching 342 million by 2011 (see Figure 1). Such huge population growth has had a fundamental impact on the economic position of the region and on the demand on its resources, including food.

Figure 1. Population growth in millions for West Africa (plus Cameroon and Chad)

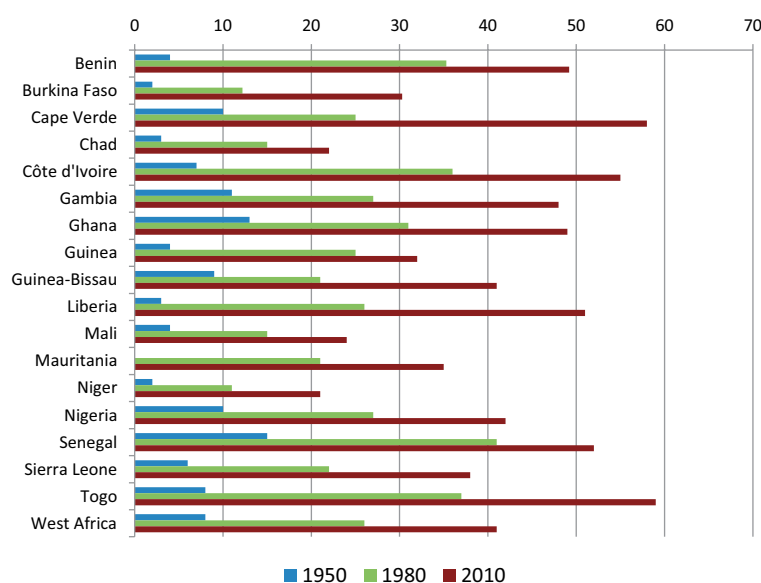


Source: World Bank, World Development Indicators (2012)

Parallel to the population growth, a second phenomenon, equally significant, was the substantial shift of the population from predominately rural to urban (see Figure 2 below). Huge migration to the cities produced a

much faster growth of the urban conglomerations than the average population growth would indicate. This also changed the balance of the labour force available between urban and rural areas, creating a massive pressure on food demand as the population of consumers grew more than rural populations (consisting of both producers and consumers). Equally significant for agricultural and food systems are changing consumer preferences, which are creating powerful drivers in the demand for some food products.

Figure 2. Rate of urbanization (in %) in West Africa from 1950-2010



Source: OECD-CSAO (2013)

2.2 Food demand trends: utilisation and food consumption

A. Staple food consumption in West Africa: dietary systems and recent trends

West Africa covers a wide range of agro-ecological systems, from arid to semi-arid, sub-humid and humid climates. These climates dictate what is typically grown and consumed. Consumption patterns vary according to countries, regions or even localities within the same country that feature diverse climates. We can identify two large groups of countries on the basis of dominant food consumption (ACI, 2011):

- Countries relying predominantly on **cereals**. This covers largely the Permanent Interstate Committee for Drought Control in the Sahel (CILSS) countries including: Burkina Faso, Chad, The Gambia, Guinea-Bissau, Mali, Mauritania, Niger, Senegal and Sierra. This group divides into countries relying mostly on sorghum and millet (Burkina Faso, Chad, The Gambia, Mali and Niger), countries eating mostly wheat (Mauritania), and rice-eating countries (Guinea-Bissau, Senegal and Sierra Leone)
- Countries from coastal West Africa relying equally on **roots and tubers** and on **cereals** for their basic diets. These include: Benin, Côte d'Ivoire, Ghana, Guinea, Liberia, Nigeria and Togo. In all these countries, consumption of cassava dominates, followed by yam (except for Côte d'Ivoire where yam is preferred over cassava). Banana plantain is also consumed in significant quantities in Cameroon, Côte d'Ivoire, Ghana and Guinea. Rice and maize consumption are also high in these countries, reaching at least 85 kg/person/year.

Table 1 below compares the consumption patterns between the coastal and Sahelian countries. Given its size and importance in the region, Nigeria is described separately.

Table 1. Caloric consumption (in Kcal/day/inhabitant) in West Africa in 2003

	Sahelian	Coastal	Nigeria
Cereals	1 684	934	1 253
<i>Maize</i>	191	307	179
<i>Sorghum</i>	374	64	362
<i>Millet</i>	604	36	294
<i>Rice</i>	372	441	284
<i>Wheat</i>	122	116	127
Starchy Roots	29	676	511
<i>Cassava</i>	15	371	249
<i>Yams</i>	4	231	204
<i>Sweet Potato</i>	7	11	37
Oilcrops	75	98	90
<i>Groundnuts</i>	69	66	39
Meat/Livestock	78	54	39
<i>Beef</i>	29	13	12
<i>Poultry</i>	12	15	4
<i>Goats and Sheep</i>	22	5	7

Source: Haggblade *et al.* (2012), retrieved from FAOSTAT Food Balance Sheets.

B. Consumption patterns and the urban/rural market divide

Much of staple food production in the region is self-consumed, with two-thirds of production consumed by rural households (ACI, 2011). Among the dry cereals, maize is a relatively more marketed crop, with a ratio of 58/42 marketed to self-consumed production. Moreover, local rural population centres (as opposed to large urban centres) are also increasingly sources of food market outlets for cereals, roots and tubers, as large urban markets continue to lack sufficient market integration.

Urban markets represent a growing marketing outlet for local staple food, accounting for a sizeable share of total consumption. Estimates for the major consumed products have been placed at 60 percent for rice, 42 percent for maize, a minimum of 40 percent for roots and tubers, including cassava, 23 percent for sorghum and 19 percent for millet. Among the cereals consumed in urban markets, rice has by far the largest share; this share has been estimated at 76 percent in Burkina Faso, 92 percent in Côte d'Ivoire, 60 percent in Ghana and Senegal and 72 percent in Nigeria. For cassava, almost 50 percent of regional production is consumed outside rural areas.

The expanding of urban markets represents a key driver for the growth of staple food value chains and for local farming systems. In addition to urbanization and demographic patterns, another demand driver is the emergence of a middle class more demanding of higher-quality food products and of safe food. This indicates that there are potential value-generating outlets for local production if adequate marketing and processing

strategies are harnessed in the region. According to an AFD-CIRAD-IFAD (2011) (henceforth ACI study), urban markets represent FCFA 150 000 to 200 000 of purchasing power per inhabitant, thus forming a major staple food demand source in the region – far greater than export market outlets. For example, in Burkina Faso in 2009, staple food urban markets (the retail end markets) generated USD 297 million of transactions, whereas export markets registered only USD 260 million of revenues. In Côte d'Ivoire, local urban markets generated USD 1 090 million compared with USD 634 million of export revenues. In Senegal, local urban markets generated USD 740 million against USD 34 million of export revenues (ACI 2011).

Box 1. The phenomenal surge of rice consumption in West Africa: A combination of population growth, urbanization, and import facilitation policies

Rice is among the staple foods most tightly connected with increased urbanization in West Africa, as a result of its greater reliance on imports and import-easing policies. Rice demand has been rising at a sustained pace since the 1960s and has been mostly satisfied through imports. Rice consumption in West Africa grew from an average of 1.3 million MT in the 1960s to nearly 6 million MT in the 1990s and almost 10 million by 2006. Population growth accounts for much, but not all, of this increase: consumption grew from 13 kg per person in the 1960s to 19 kg per person by 2006. Population growth (which averaged 2.7 percent through the 1990s, easing slightly to 2.6 percent between 2000 and 2005) cannot explain the accelerated increase in rice consumption over the last few years. This seems rather to be principally the result of two factors: income growth and urbanization. In West Africa, rice consumption complements other staples, such as sorghum and millet, as these foods tend to be consumed at different times of the day. Variants of sorghum, millet and rice are also consumed as cakes or fritters, mostly as street food or snacks. The main substitutes for rice in urban areas are cassava (*gari*, *fufu*) or pounded yam and *banku* (made with maize) or *acheke*.

Consumer preferences vary greatly between and within countries. Rice preferences, for example vary across markets. In Ghana, 5 percent broken non-aromatic Thai rice dominates but aromatic jasmine Thai rice has gained market share, representing over 20 percent of rice imports in recent years.

The West African rice market is increasingly heterogeneous, as reflected in the procurement practices of several large international rice importers, such as Louis Dreyfus, Olam, CIC and others, who operate through individual country offices that understand and cater to the specific needs and preferences of consumers in those countries.

In many West African markets, local rice continues to be hampered by lower quality (higher levels of impurities), resulting in discounted prices and lower demand. The preference for imported over local rice is more prevalent in the coastal countries that depend more on such imports. However, in Mali and Guinea, consumers prefer local rice in terms of freshness and taste. Local rice also plays an important role in certain urban markets in Senegal (Saint Louis area) and in Nigeria (Kano area) (USAID, 2011).

Box 1. The phenomenal surge of rice consumption in West Africa: A combination of population growth, urbanization, and import facilitation policies (Cont.)

According to the Africa Rice Center, consumer preferences in West Africa can be summarized as follows:

- (a) *Long-grain white rice* with an intermediate level of starch dominates the markets in most of West Africa, except for those markets that prefer parboiled or broken rice (see below). Preferences for broken rice differ between countries. In Ghana, most consumers prefer rice 0-5 percent broken, but 25 percent broken is also used in limited quantities, and 100 percent aromatic broken rice from India and Pakistan can also be sold. In Burkina Faso, Côte d'Ivoire and Mali, the predominant consumer preference is for 25 percent broken rice.
- (b) *Broken rice* is sold as a low-quality, low-cost product in most markets, but is the preferred rice product in Senegal and Mauritania. According to Slayton, about 500 000 MT of Thai Jasmine broken rice is typically imported into West Africa, with three-quarters of this amount imported by Senegal and about 15 percent by Mauritania. Overall imports of broken rice to West Africa are calculated by ITC using UN COMTRADE data at 1.5 million MT, of which 50 percent is imported by Senegal (USAID, 2011).
- (c) Parboiled rice can be either of high quality (with a golden tinge) or low quality (with a dark color and sometimes an odor). Burkina Faso transforms a large share of its rice production into parboiled rice; this is done mostly by women. Nigeria is one of the largest importers of fully-milled, high-quality parboiled rice and Liberia is one of West Africa's top importers of low-quality parboiled rice.
- (d) Aromatic rice is a growing rice market segment that commands premium prices (USD 300-400/MT over non-aromatic rice) and is imported mainly from Thailand (the benchmark) and Viet Nam. Ghana started the trend toward this rice market segment, but it is also gaining popularity in other parts of West Africa.

Since 60 percent of West Africans are projected to live in urban areas by 2020 and the number of cities with more than 100 000 inhabitants will grow from 78 in 2006 to more than 200 in 2030, demand for imported staples such as rice is likely to increase. This requires a significantly upgraded staple food processing capacity in the region.

C. Staple crops and non-food markets

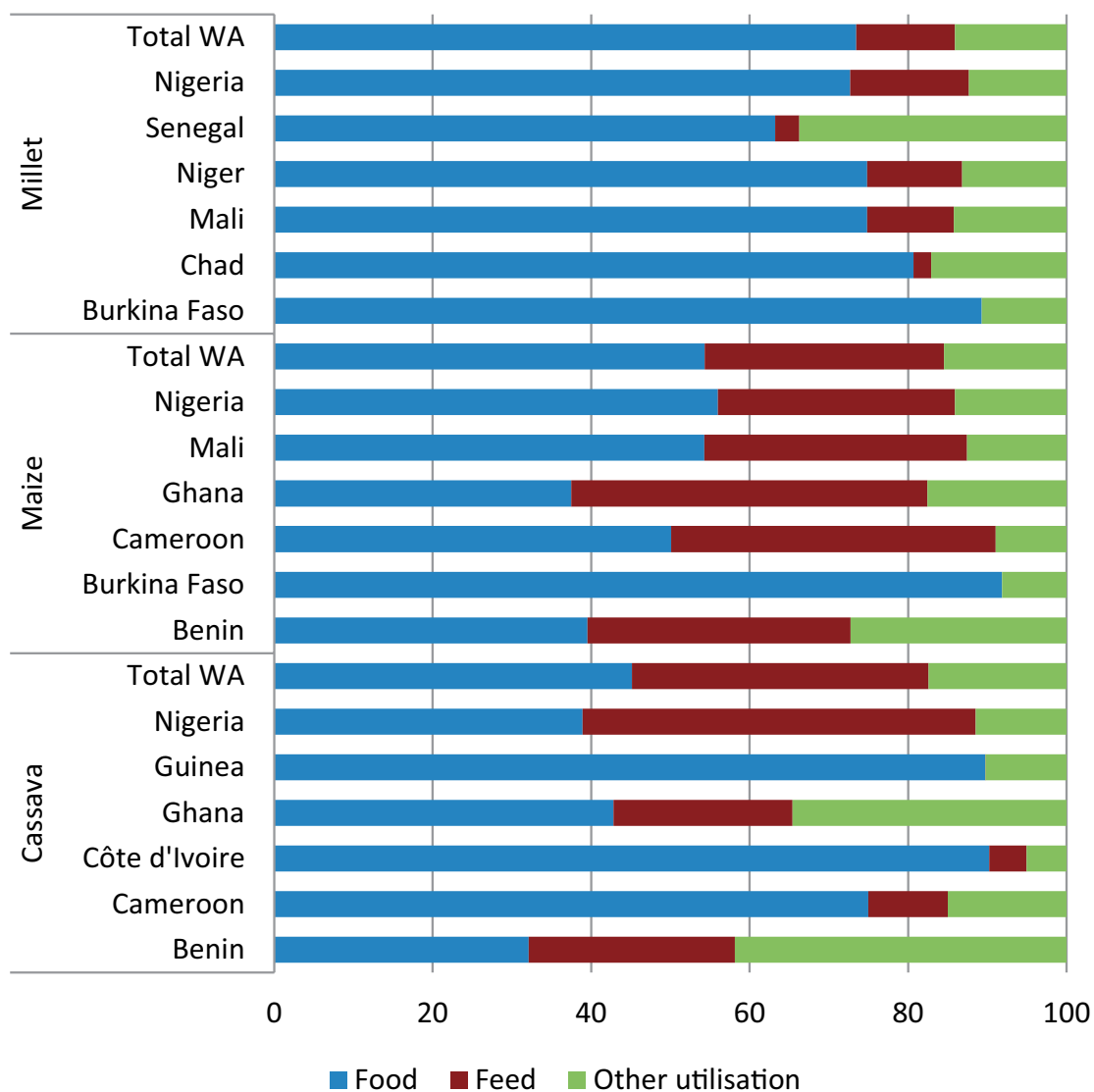
Staple food crops can serve a whole range of market outlets outside of direct food consumption. Staples like maize² and cassava³ can be used as raw inputs into a wide range of food, feed and industrial products, offering endless possibilities for agroprocessing development and huge multiplier effects within the local or regional economies.

² Maize flour, or meal (*sadza, nshima, ugali and mealie pap* in Africa); maize meal (replacement for wheat flour); corn-bread and other baked products; corn syrup (sweetener instead of sugar) in thousands of food products such as soda, candy, cookies and bread; cornstarch (a thickening agent in soups); corn for feeding cows, hogs, catfish and chickens.

³ Cassava uses include starch for adhesives, corrugated boards, gums, wallpaper, foundries, well-drilling, paper industry, textile industry, wood furniture, particleboard; biofuels; alcohol products; dusting powders; drugs; plastics; packaging; stain remover; concrete stabilizer; and remoistening gums.

Figure 3 below summarizes the shares of three types of uses (food, feed and industrial processing) for maize, cassava and millet for the top six producers in West Africa.

Figure 3. Staple crop utilization shares (in %) by top producers (2009)



Source: FAOSTAT (2012)

Maize

Looking at maize utilization by country in the region, we observe growth in maize feed use, though with a high degree of variability across countries and areas. In Benin, maize feed use represents two-thirds of national supplies, up from less than 8 percent in the early 1990s. Burkina Faso has a low maize processing capacity, given that 92 percent of national supply is used directly as food. For Mali and Cameroon, the maize food share has declined from 80 percent to 55 percent over the same period. It has remained at around 70 percent in Togo, 65 percent in Côte d'Ivoire and around 55 percent in Nigeria over the last two decades. Ghana has exhibited a significant increase in maize feed use, from 40 percent in 1990 to 55 percent recently. However, processed products continue to represent a marginal share for maize, although this has actually decreased.

Cassava

A review of cassava utilization trends in the last two decades shows that the share of production for non-food use has been growing in many countries, such as Benin and Nigeria. In Nigeria, feed use has overtaken food use in recent years, now representing around half of its national supplies, compared with only one-third in the early 1990s. In Benin, cassava food consumption has been growing steadily, but non-food use has grown even faster. In Cameroon, there is little movement in processed cassava while food consumption has risen sharply in recent years. (See Chapter 16 for a detailed treatment of marketing and processing constraints on cassava in Cameroon.) In Ghana, feed uses have increased from 15 percent to 25 percent of national supplies, while other utilizations have remained around 30-35 percent. Overall for cassava in West Africa, the share of feed use grew from 23 percent to 37 percent of regional supplies between 1990 and 2009.

Millet

Millet is produced largely for direct food consumption, although a small share of millet goes to other uses. In Senegal, about 100 000 tonnes (or 20 percent of total production) is for non-food use; this share has increased in recent years, rising to one-third of total millet, with two-thirds going for direct food consumption. In Guinea, there has also been an increase in non-food use for millet in recent years. One can find the same trend for Mali, showing a slow increase of non-food millet use over the last decade, although food consumption of millet has grown faster over the same period. Some countries, such as Senegal and Guinea, have diversified millet somewhat towards other utilizations.

Oilseeds

Most of the oilseed production (groundnuts and palm oil) increasingly targets export markets and is less and less directed to regional ones. For palm oil, most top-producing countries split the production between domestic use for food consumption and for exports (to neighbouring countries or internationally). Côte d'Ivoire has the highest self-consumption level of palm oil, with 95 percent of output locally consumed as food, compared to 40 percent for Cameroon and Nigeria and only one-third for Ghana. Over time, the share of palm oil exports has increased for the top producers, especially Ghana (from one-third to two-thirds) and Nigeria (from 30 percent to 70 percent of production exported).

Livestock and meat products

The livestock sector in West Africa could be called the "silent giant". The sector is huge, with over 60 million head of cattle, 160 million small ruminants, and 400 million poultry (OECD/CSAO). In addition to its importance for food security and nutrition, providing protein sources which are in deficit in the region as a whole, livestock plays an enormous role as a source of capital and security for small-scale herders and farmers. Yet despite this fact, livestock is not given the investment priority it deserves and consequently production continues to be seriously underdeveloped.

Consumption statistics are scant as well, and no reliable analyses quantifying household meat and protein consumption in the region have been made. Some information on the consumption of poultry is beginning to emerge, as this subsector is showing signs of growth in some markets, especially in coastal countries near large urban agglomerations. It is believed that poultry consumption is mainly sourced from domestic production, which accounts for over 80 percent of consumption (Schneider and Plotnick, 2010), although imports of frozen chicken have been rising, especially from Brazil and the European Union (EU). Poultry consumption is projected to grow and to rely increasingly on imports (especially European-subsidized, poultry-related by-products). A widening gap between regional production and demand is anticipated. Currently, imports represent only 28 percent of the consumption markets (FAOSTAT, 2012). Indeed, the gap between domestic production and demand has been increasing over the years, from 16 000 MT in 1990 to 50 000 MT in 2000, and is expected to increase further to 62 000 MT by 2015 (Dieye *et al.*, 2004).

3. Staple food in West Africa: An overview of supply drivers

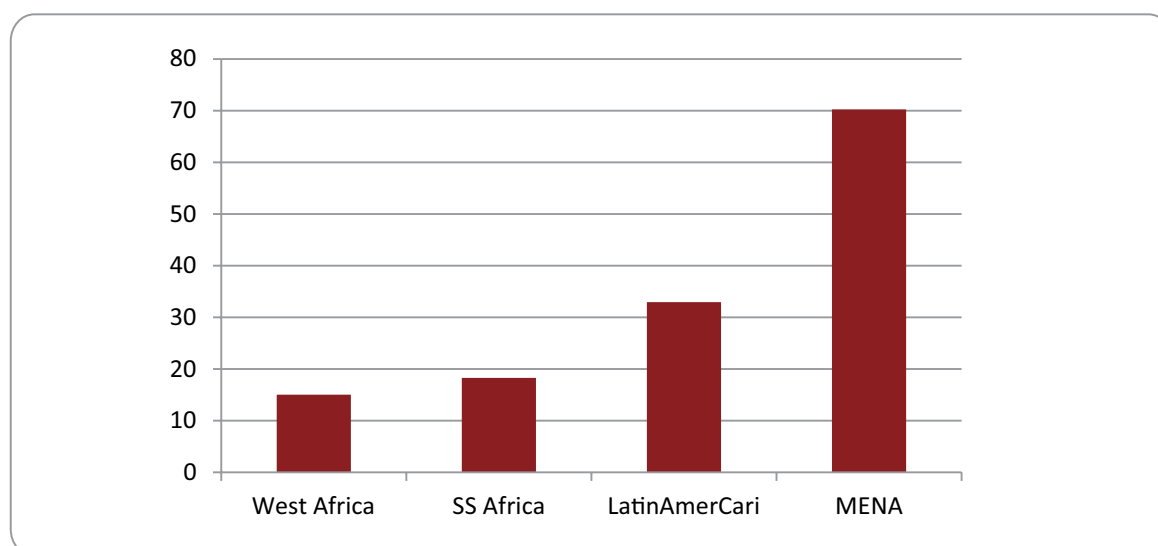
3.1 Strengthening the production-supporting environment

In this section we will review briefly the state of the key drivers affecting unit cost of production, including infrastructure (hard and soft), land, energy and other inputs, as well as the institutional setting, such as the business environment, legal enforcement of rules and transparency, and bureaucratic red tape and other transaction impediments. Attention to all these elements is essential to enable rebuilding of the productive capacity of the staple food systems and to strengthen agroprocessing and market creation opportunities. This should stimulate demand for enhanced production and delivery of high-quality, high-value products, equally benefiting small-scale producers and small businesses, as well as larger-scale operators.

A. infrastructure (roads; communications)

Hard Infrastructure: The provision of infrastructure is essentially a public responsibility, although there are opportunities to engage the private sector in joint investments under appropriately designed public/private partnerships (PPPs). The lack of paved roads (see Figure 4 below) and well-maintained infrastructures is an impediment to market and business operations and slows down prospects for faster integration. Such a sub-optimal state of road infrastructure also raises business and market risks, increases lead time and costs and hampers competitiveness. Infrastructural constraints (transport, communications) also seriously impede farmers' responses to market price signals and value chain incentives. In West Africa, it is estimated that about 40 percent of the cost of food comprises just transport costs.

Figure 4. Share of paved roads (2004)



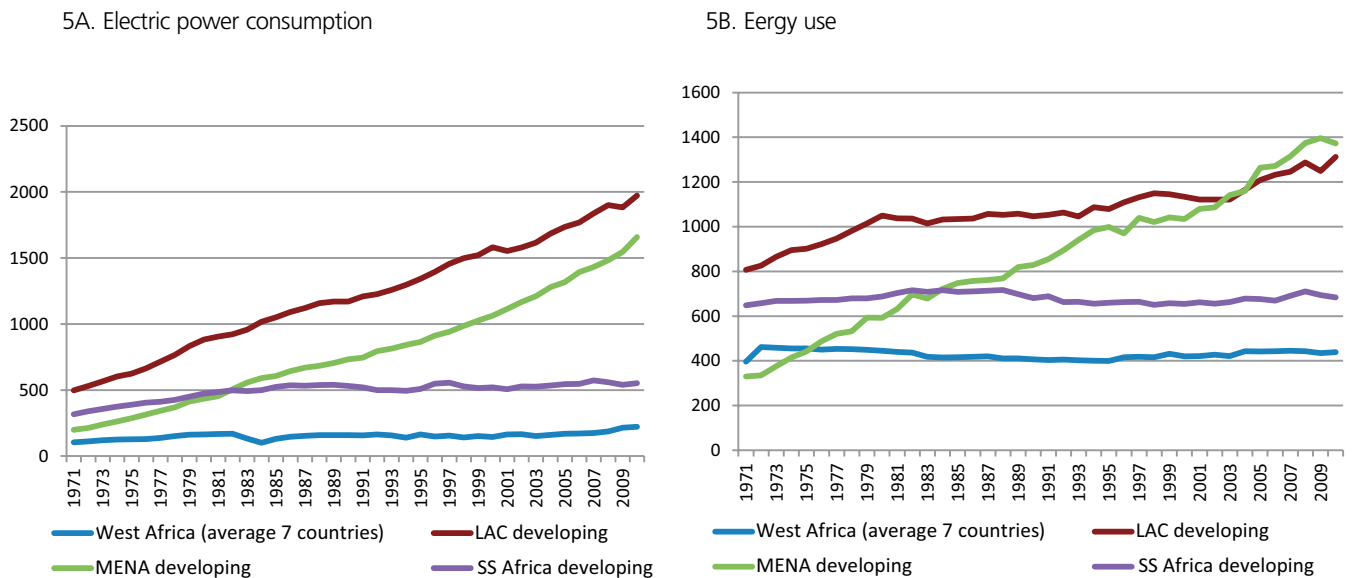
Source: World Bank, World Development Indicators; authors' calculations.

Soft Infrastructure: The lack of adequate communication infrastructure seriously impedes trade, especially for landlocked countries. The latter are doubly handicapped by poor road conditions as well as inefficient regulation of the trucking industry, resulting in exorbitant inland transport prices (Teravaninthorn and Raballand, 2008), which are much higher than in other parts of sub-Saharan Africa. According to a 2009 World Bank report, only 16 percent of roads in Burkina Faso are paved and require low maintenance. Air freight is constrained by the large number of low-capacity airports. Trans-border trade is also costly because of inefficient custom institutions, in spite of the revival of trade corridors between Togo, Ghana and Benin. Poor phone networks (despite improvements for mobile access) and Internet, along with high associated costs, deprive business operators of the opportunity to lower transaction costs and enhance business and marketing.

B. Energy use, utilities and costs

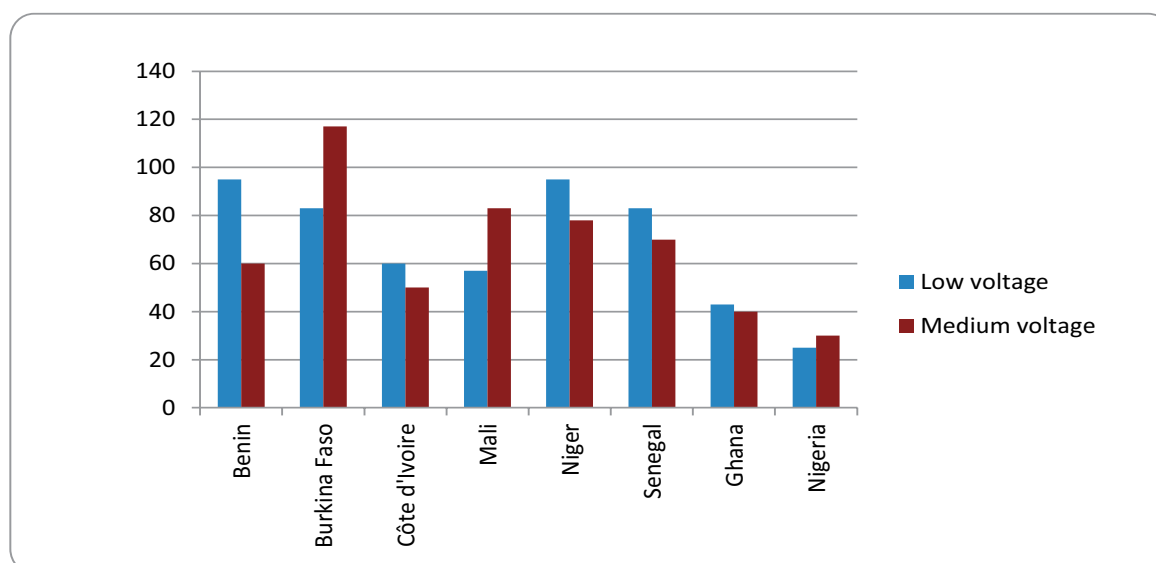
Data on electricity and energy use on a per capita basis reveals the serious deficit for West Africa as a region. There has been no progress in building up the energy infrastructure needed since the early 1970s, beyond keeping up with population growth (as shown by the flat lines for West Africa in Figures 5A and 5B below). By contrast, among developing countries, North Africa and the Near East showed robust and steady growth on par with the trends observed in Latin America. The bleak energy use picture for West Africa is closely linked to the very limited agroprocessing capacity, which continues to languish from insufficient energy availability and high energy costs.

Figure 5. Electric power consumption (kwh per capita) and energy use (kg oil equiv. per capita)



Source: World Bank, World Development indicators; authors calculations

Unreliable power supplies are a huge constraint and entail additional costs and loss of competitiveness for the countries which suffer from them, such as Benin and Burkina Faso, as shown in Figure 6 below. Where the electricity potential is limited and imports are significant, associated difficulties may rise in conjunction with other failures, such as the monopolistic distribution seen in Burkina Faso (high prices and low quality of provision).

Figure 6. Cost of electricity in some West African countries (CFAF/ Kwh)

Source: World Bank, CEM Burkina Faso (2009)

C. Regulation and corruption

Enforcement and credibility of the rule of law and the formal regulatory framework are major factors determining the business environment and their deficiency can pose a serious impediment to investment and to food agroprocessing development. A study by the World Bank, covering many West African countries, quantified these costs for private enterprises. Results are summarized in Table 2 below. The addition of security costs and costly time to import and export costs means that between 5 and 8 percent of sales are lost due to the aforementioned inefficiencies, putting a strong constraint on overall competitiveness.

Table 2. Indirect and invisible costs as percentages of firms' sales

	Indirect costs			Invisible costs				Total indirect and invisible costs
	Transport	Telecom	Customs	Losses due to power outages	Cost of manager's time to deal with regulations	Cost of corruption: informal payments to get things done	Cost of security measures	
Burkina Faso, 2006	2.23	0.70	1.63	1.20	0.05	1.48	0.86	8.20
Benin, 2004	-	-	0.48	1.16	0.06	4.27	0.57	6.55
Mali, 2007	1.96	0.86	0.26	1.39	0.05	0.24	0.12	4.60
Uganda, 2006	1.08	0.50	0.52	28.16	0.06	2.18	0.43	32.93
Zambia, 2007	0.61	0.71	0.68	1.79	0.04	0.05	0.93	4.81

Source: World Bank, Enterprise Surveys (2004-2007) Estimates are based on at least 15 observations.

D. Transport

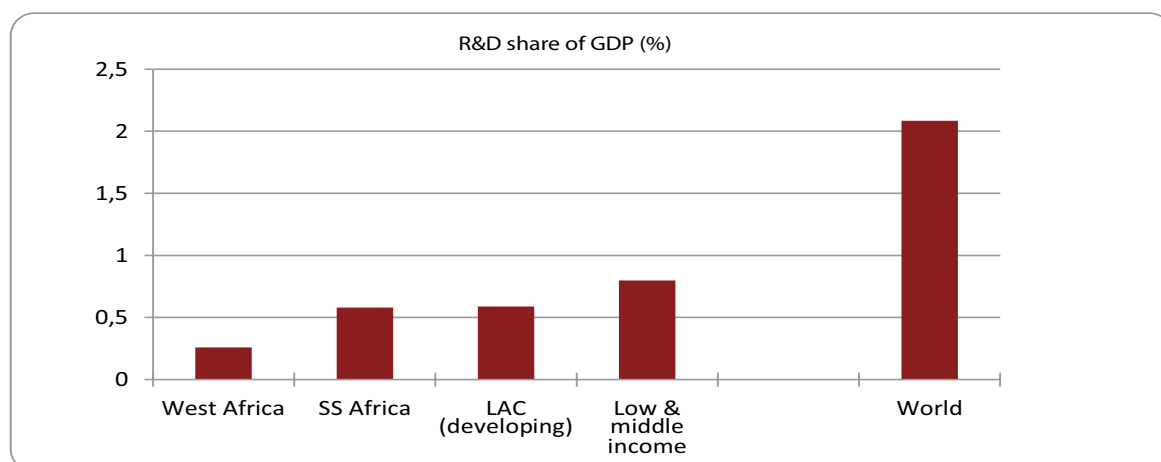
Transport services play a significant role in marketing and trading costs. The current status of transport services in West Africa constitutes a serious impediment to further development and expansion of intra-regional trade, in light of the huge untapped potential. In West Africa, transport costs (vehicle operation, license insurance, tolls, etc.) are higher compared with other regions in Africa. Transport tends to offer lower-quality services at higher prices, due in large measure to the regulations and market access barriers imposed on the trucking industry, as well as the corruption practices in freight-sharing schemes that tolerate the continued operation of older fleets. Generally, bad road conditions are the main cause of high variable operating costs, as they increase fuel consumption and maintenance costs, as well as reducing the longevity of vehicles (Teravaninthorn and Raballand, 2008).

In West Africa, even within the international corridor routes where road quality is good or adequate, transport costs are still too high owing to the influence of truck cartels (informal market-sharing arrangements), existing regulations (through freight bureaus and shippers' councils) and the absence of competition from alternative transportation (rail services).

E. Investments- research and agricultural productivity

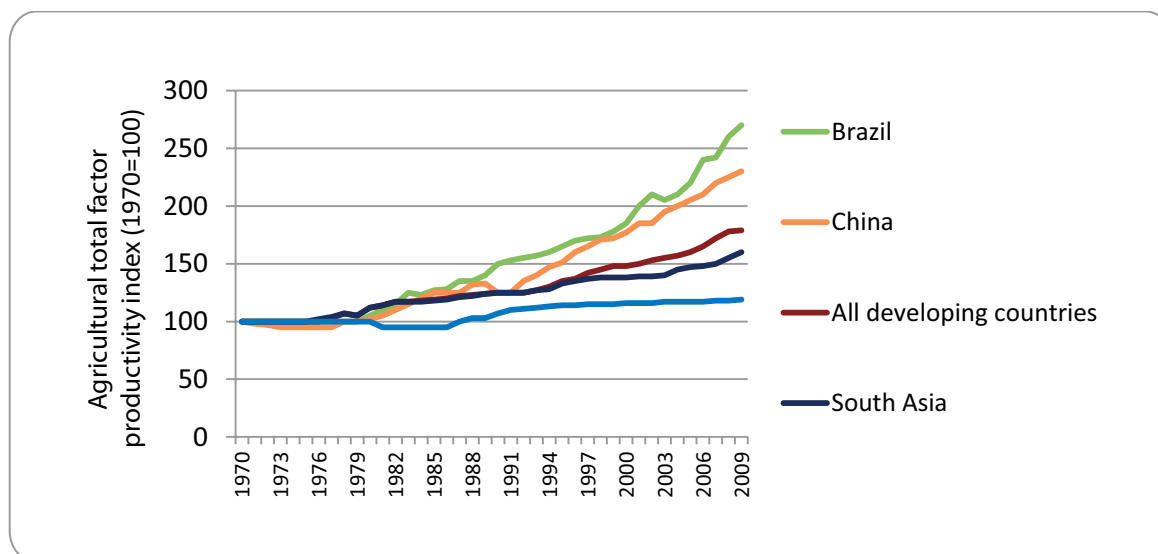
In West Africa, spending on research and development (R&D) is minimal, averaging about 0.25 percent of gross domestic product (GDP), with no change since the 1990s.⁴ This is minimal even compared with elsewhere in Africa (overall Africa's spending on R&D averaged over 0.55 percent). According to an Agricultural Science and Technology Indicators (ASTI) global assessment report on agricultural R&D for 2012 (Bientema *et al.*, 2012), during 2000-2008, close to half of the reported countries in sub-Saharan Africa recorded negative yearly growth in public agricultural R&D spending, ranging from - 0.2 to - 12.0 percent per year, despite an overall aggregate spending increase for sub-Saharan Africa by about a third for the same period. The declining spending levels were particularly severe in French-speaking West Africa. For a number of West African countries, such as Burkina Faso, Guinea, Senegal and Togo, the completion of large donor-funded projects with World Bank financing, left a significant lack of R&D in these countries (IFPRI, 2012).

Figure 7. R&D share of total GDP for West Africa and other comparable regions and the world (averaged over the period 1997-2009; various reporting years)



Source: World Bank, World Development Indicators (various years)

⁴ 10-year average for reporting countries: Burkina Faso, Ghana, Mali, Nigeria and Senegal (World Bank, WDI).

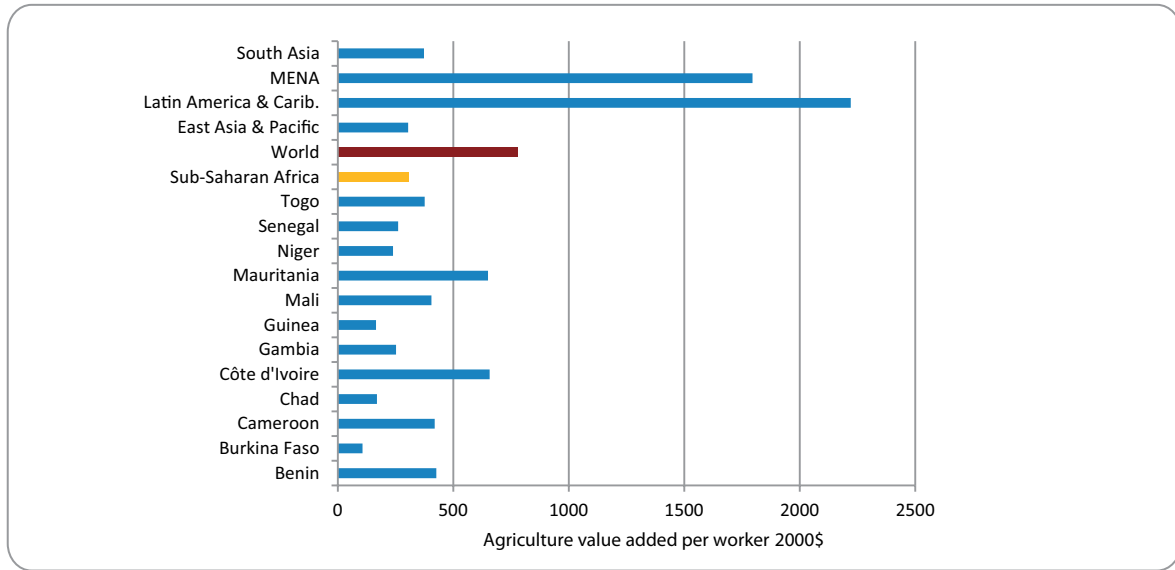
Figure 8. Trends in total factor productivity for sub-Saharan Africa and other developing regions

Source: Fuglie 2012

Developing countries that sustained higher agricultural growth since the 1980s – measured as total factor productivity (TFP) – demonstrated a strong commitment to complementary policies and institutional reforms besides increased agricultural R&D spending. Among these reforms are improved incentives for farmers, macroeconomic stability, relatively strong extension and rural education systems, and improved rural infrastructure and market access (Bientema *et al.*, 2012)

Available data show that more than 50 percent of total foreign direct investment (FDI) inflows to sub-Saharan Africa target natural resource sectors. The agricultural sector in the region has attracted modest FDI. A United Nations Conference on Trade and Development (UNCTAD) FDI brief shows that in the case of Nigeria, the FDI stock in the country is 17 times higher for extractive industry compared with agriculture (USD 6417 million compared with USD 386 million in 1992). Moreover, most of the agriculturally-oriented FDI is geared to high-value export commodities. Examples from the 1990s show that the major FDI projects include Del Monte's investment of more than USD 9 million in bananas in Cameroon, Lonrho's USD 7.5 million investment in tea estates in Tanzania, and Aberfoyle Holding's multimillion dollar investment in palm oil in Zimbabwe (Mugabe, undated).

It is not surprising that agricultural productivity (measured as agricultural value added per 100 workers) remains relatively low compared with other developing regions, as shown in Figure 9 below. In contrast to West Africa, the low rates for developing Asia reflect a much higher population density rather than low productivity *per se*.

Figure 9. Agricultural productivity (agricultural value added per worker)

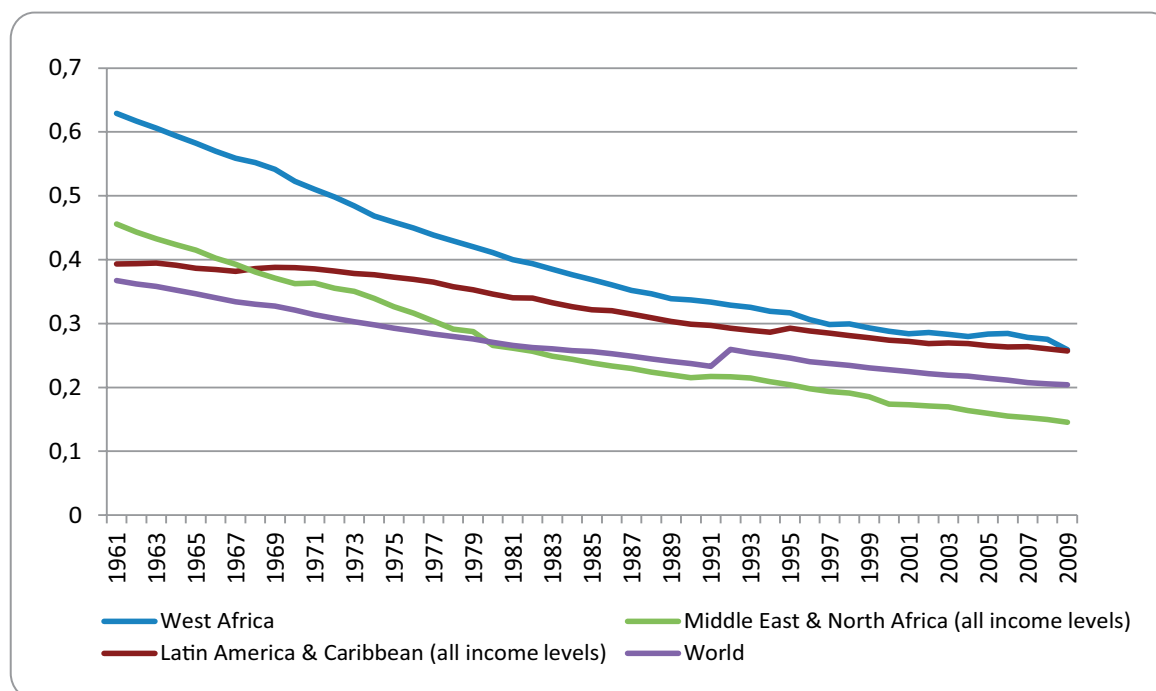
Source: World Bank, World Development Indicators; authors' calculations.

Having reviewed a number of key economic indicators affecting the food supply potential of West Africa, we now turn to the staple food systems, describe their production patterns and review their current productivity status and potential, with particular reference to the key staple food crops in the region. Among the productivity variables we will review are the yield patterns, as well as soil fertility – a key impediment to future food productivity growth in the region.

3.2. Staple food production: composition and trends

Compared with other regions, West Africa (and similarly elsewhere in Africa) started out with a relatively high ratio of land per capita (over 2/3 ha per capita in 1960). But since then, the strong population growth has significantly reduced this ratio to less than 1/3 ha per capita. Compared with Latin America, West Africa had over 50 percent more land per capita in the beginning of the 1960s; however, that advantage all but disappeared with both regions reaching the same level – around 0.26 ha per capita – by 2009.

Figure 10. Available land per capita in West Africa and other regions (ha per capita)

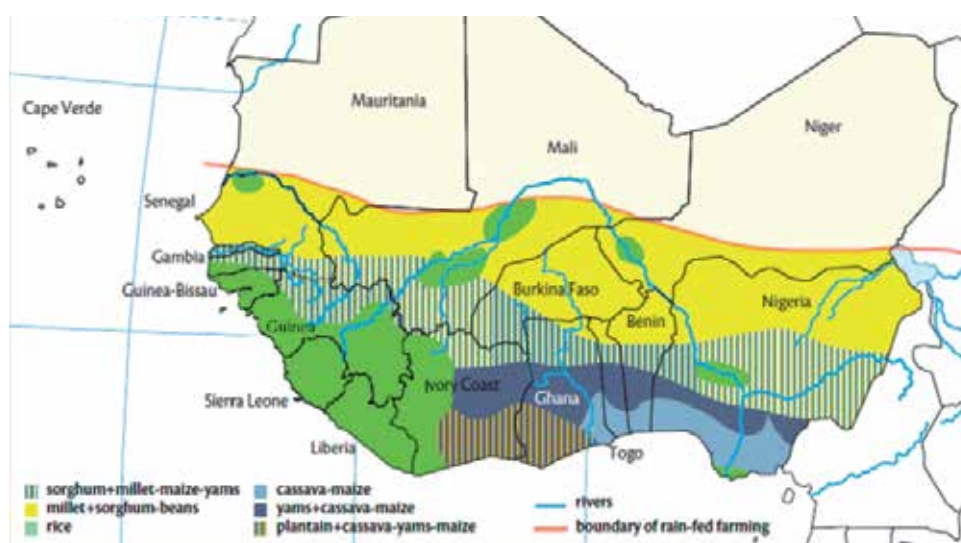


Source: World Bank, World Development Indicators; authors' calculations

B. What food does West Africa produces?

The major food crops produced in West Africa are reported in Table 3 and in Figures 11 and 12. We see from Table 3 the predominance of cereals and roots and tubers in the top 10 crops, but also a variety of other cash crops, fruits and vegetables in the top 20. The region also has an extensive livestock production, averaging over 216 million head of cattle, 69 million head of sheep and goats and over 450 million head of chicken for the period 2005-2010. In Figure 11, we see the geographical distribution of the major food crops, with the Sahel countries dominated by cereals (sorghum, millet, maize, rice and *fonio*); further south in the coastal countries we also find roots and tubers (cassava, yams and plantain).

Figure 11. Geographical distribution of the major food crops in West Africa



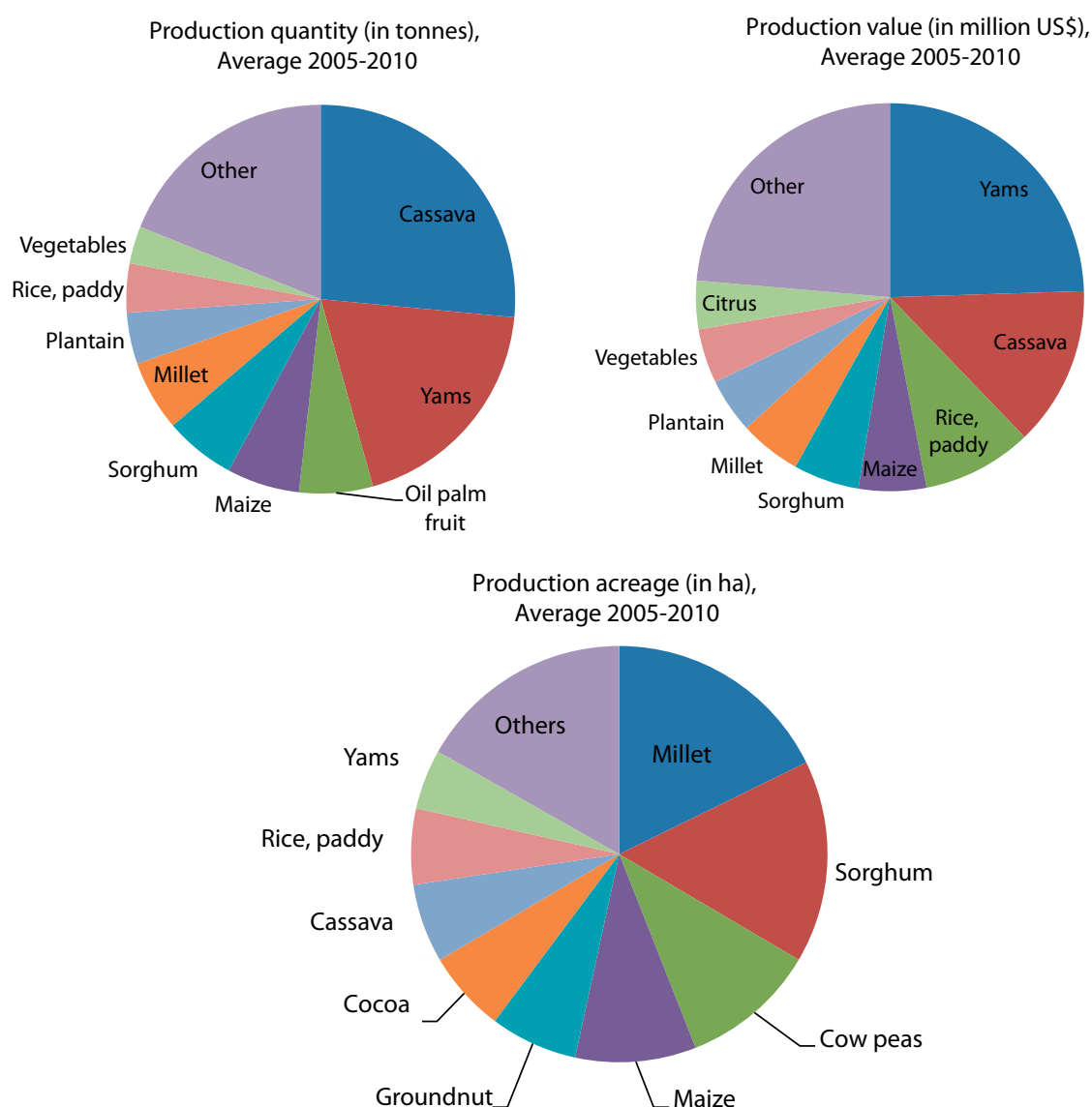
Source: Bureau Issala, Chaléard J.L. and SWAC; extracted from Blein *et al.* (2008)

Table 3. Top 20 food crops in West Africa ranked in terms of production volume, value and acreage (average 2005-2010)

Production acreage (in 1000 ha)*			Production Quantity (in 1000 tonnes)*			Value (current million US\$)*		
Crop	Average 2005-2010	Rank	Crop	Average 2005-2010	Rank	Crop	Average 2005-2010	Rank
Millet	16,68	1	Cassava	65,66	1	Yams	24.996	1
Sorghum	14,79	2	Yams	47,54	2	Cassava	13.569	2
Cow peas, dry	9,92	3	Oil palm	15,20	3	Rice, paddy	9.358	3
Maize	8,83	4	Maize	14,98	4	Maize	5.749	4
Groundnuts	6,38	5	Sorghum	14,65	5	Sorghum	5.603	5
Cocoa beans	5,95	6	Millet	14,51	6	Millet	5.236	6
Cassava	5,76	7	Plantains	10,62	7	Plantains	4.666	7
Rice, paddy	5,55	8	Rice, paddy	10,10	8	Vegetables, fresh	4.627	8
Yams	4,38	9	Vegetables	7,71	9	Citrus	4.119	9
Oil palm fruit	4,24	10	Taro (cocoyam)	7,69	10	Cocoa beans	3.535	10
Seed cotton	2,24	11	Sugar cane	7,17	11	Groundnuts	3.031	11
Cashew nuts	1,73	12	Groundnuts	6,95	12	Cow peas, dry	2.967	12
Plantains	1,52	13	Cow peas, dry	4,72	13	Palm oil	2.859	13
Sweet potatoes	1,30	14	Sweet potatoes	4,20	14	Chillies/green peppers	2.182	14
Taro (cocoyam)	1,14	15	Citrus	3,95	15	Tomatoes	2.083	15
Vegetables	1,05	16	Tomatoes	3,25	16	Taro (cocoyam)	1.762	16
Coffee, green	0,96	17	Cocoa beans	2,71	17	Cashew nuts	1.717	17
Pulses, nes	0,82	18	Seed cotton	2,36	18	Maize, green	1.441	18
Melonseed	0,82	19	Other fruit	1,98	19	Sweet potatoes	1.415	19
Citrus	0,80	20	Onions, dry	1,95	20	Onions, dry	1.108	20

Source: FAOSTAT (2012); *Note: The data is for West Africa plus Cameroun and Chad; for value of production Chad is not included.

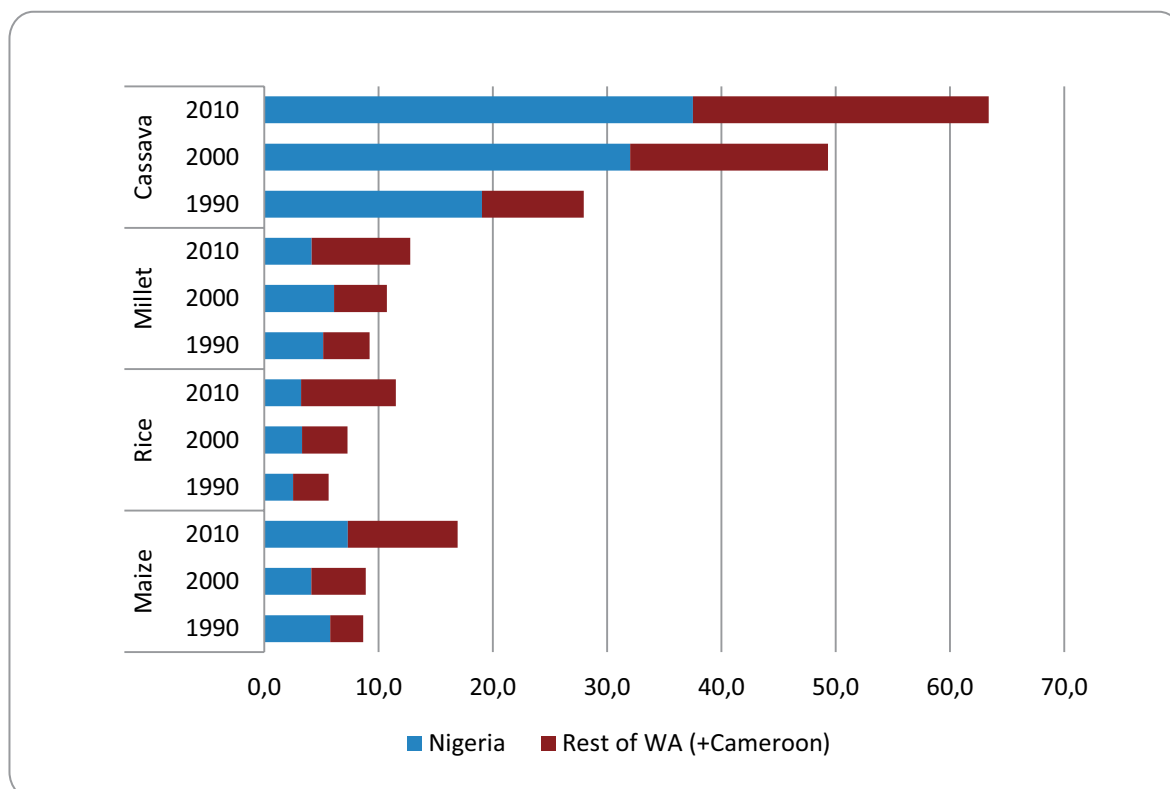
Figure 12.* Top commodities produced in terms of volume (12A), acreage (12B) and value (12C)



***Note:** The data for value of production does not include Chad.

Source: FAOSTAT (2012)

Nigeria represents about half of West Africa in terms of population, and the size of its economy dwarfs the other countries of the region. For most staples, Nigeria alone produces half or more than half the production of all the rest of the region's countries. However, the growth rate of Nigerian staple production has been slower than in neighbouring countries, allowing them to catch up with Nigeria and chip away at its regional market share (Figure 13).

Figure 13. Nigeria's share of staple crop production in West Africa (MT)

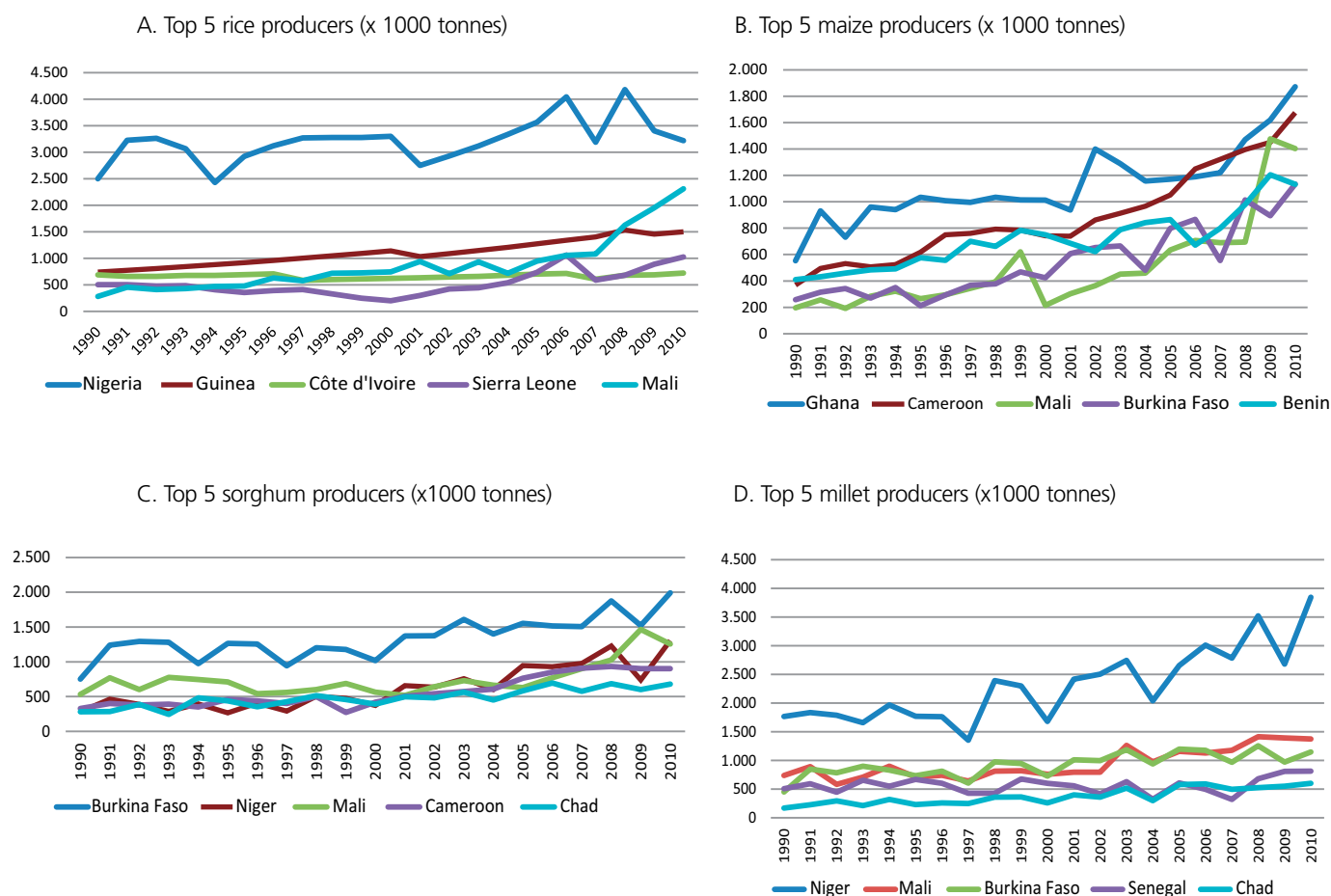
Source: FAOSTAT (2012)

In terms of production patterns, staple food production, on aggregate, has increased more slowly during the 1990s but the pace has picked up since 2000. The trends are general across staple crops and for many countries of the region. Maize, rice, and cassava production have exhibited the highest per annum growth rates (by a factor of between 2 and 2.7) while sorghum and millet have increased more modestly (by a factor of 1.5)⁵ The growth of production has been based on bringing more land into production, with some increase in labour and land productivity as well. However, these modest productivity increases are way below the levels required to ensure better food security and reduced trade deficits. Further productivity increase is highly likely since the yields of most crops are currently rather low compared with yields in other African and developing countries.

a) Cereal production in WA

Cereal production trends by crop are reported in Figures 14A to 14D.

⁵ Production growth has also been significant for other roots and tubers, such as potatoes which have been multiplied by 10 times since the 1980s (AFD-CIRAD-IFAD 2011).

Figure 14. Cereal production trends in West Africa since 1990

Source: FAOSTAT (2012)

The ACI study (2011) showed that in both rural and urban areas, regional demand for rice has far outpaced production levels since the middle of the 1970s; the gaps have been filled with ever-increasing imports, especially from Asia. Almost half of the rice consumption (48 percent) is currently from imports; urban consumers do not turn more to local crops, even when rice prices increase. Countries like Côte d'Ivoire, Ghana and Senegal produce less than half of their consumption. Consumption projections by 2025 show a doubling in rice demand (mostly driven by urban markets), which would require tripling of production if greater reliance on imports is to be avoided.

Figure 14A above shows that during the period from 1990 to 2009, there was hardly any change in production for Côte d'Ivoire, a steady increase for Guinea, and erratic production changes for Nigeria. Several other West African countries boosted their production since 2007, notably Sierra Leone. The most dramatic rice production increase took place in Mali, since the onset of the food crisis in 2007/08.

For maize (Figure 14B), apart from Nigeria (which alone produces as much as the next top seven countries in the region and where maize production has been fluctuating), the production patterns for maize among the top producers showed a relative stagnation during the 1990s but with some increases from 2000 to the present. Benin, Cameroon and Ghana have seen maize production go up since 2000. Burkina Faso's production has been steadily rising since the mid-1990s, while Mali has experienced the most dramatic maize production increase since 2008, with a trend similar to the one experienced for rice.

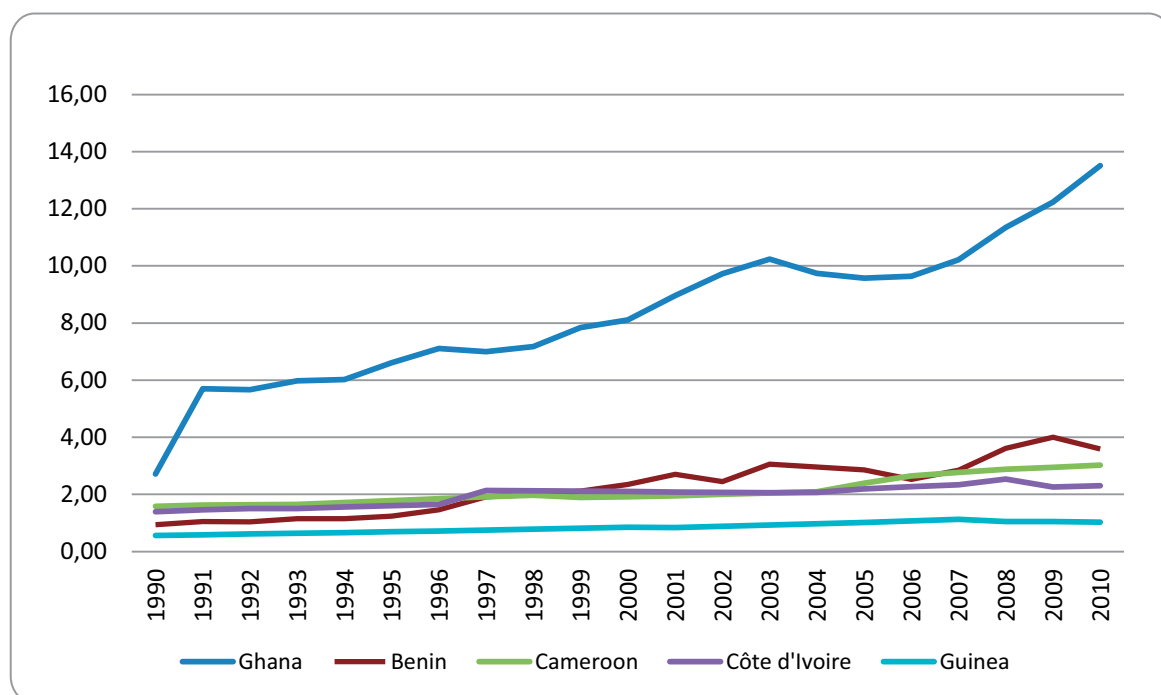
The top sorghum producers, outside of Nigeria, all exhibited a slight increase in production during the last decade (mostly since 2000. Figure 14C). Mali experienced a relatively sharp increase in sorghum production between 2005 and 2009, while in Chad, sorghum production only slowly trended upward since 2000. Burkina Faso is the second largest sorghum producer (outside Nigeria) but production levels are quite variable from year to year.

For millet, there was no significant production increase in the region and there was only a slow increase among the top producers (outside Nigeria), with the exception of Niger (Figure 14D). At the aggregate regional level, production has been more or less stable during the 1990s throughout the region but increased during the last decade as areas expanded; one possible explanation is that farmers returned to millet as some traditional export crops were contracting due to collapsing prices. Chad has been steadily and slowly raising its production, now reaching a level of 0.5 million tonnes – about the same level as Senegal. The latter has not significantly increased its millet production before 2009.

Overall, the current patterns of millet and sorghum production would not be sufficient to meet expected demand increases (from 35 to 75 kg/capita/year), especially in rural Sahelian areas (ACI, 2011). Even a production boost of 20 percent will not come close to meeting the increasing consumption demand. Regional deficits of 4.8 million tonnes of millet and 2.5 million tonnes of sorghum by 2050 are to be expected if further productivity increases are not realized.

b) Roots and tubers

Figure 15. Top West African cassava producers (x 1000 tonnes)



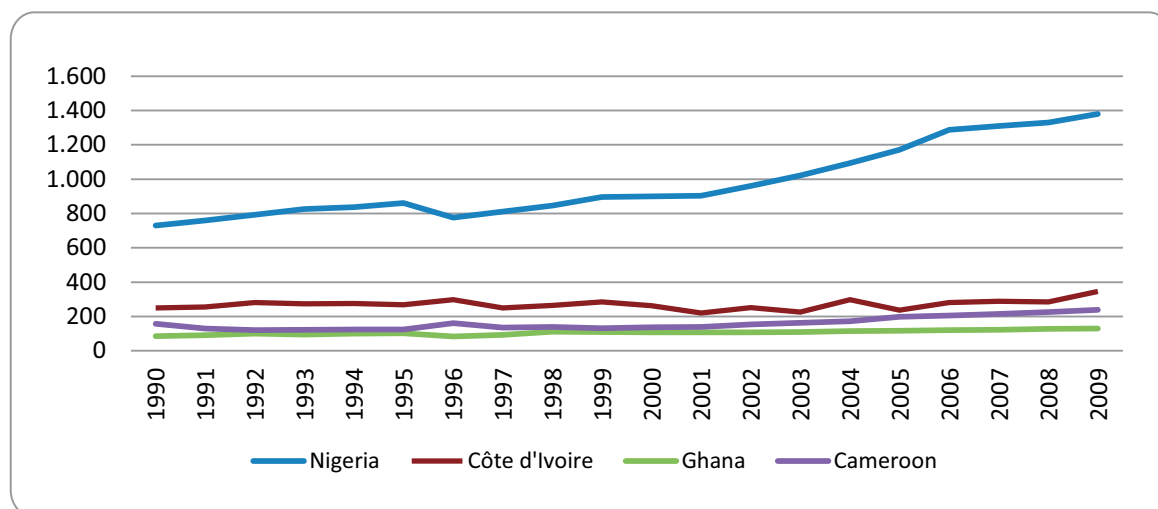
Source: FAOSTAT (2012)

Very little has changed among the small producing countries in the region over the last two decades, due principally to the fact that data for cassava are not collected in as consistent a manner as for other staple crops. Among the five top producing countries (producing over 1 million tonnes by 2010), Ghana has expe-

rienced the most dramatic production increase, growing from 6 million tonnes in 1991 to over 13 million tonnes in 2010. The other big producers (Benin, Cameroon and Côte d'Ivoire) also increased cassava production but at a slower rate. The regional giant (Nigeria) increased cassava production from about 20 million tonnes in 1990 to over 45 million tonnes around 2008 but dropped below 40 million by 2010.

c) Vegetable oils: The rising oil palm and the contracting groundnuts

Figure 16. Top 4 palm oil producers in West Africa (x 1000 tonnes)



Source: FAOSTAT (2012)

The main growth in palm oil production over the last two decades has been in Nigeria, where production rose by 84 percent from 1990 to 2010; production for all other countries in the region, including Cameroon, contracted by an aggregate 22 percent over the 1990 to 2010 period. Hence, all the West African growth in palm oil production appears to be solely the result of production expansion in Nigeria – although poor data collection might also be responsible for this observation.

Oilseed regional production remains low (palm oil and groundnut production only represent 3 percent of global oilseeds production and 1 percent of global exports) compared with the global demand and the huge export potential for West Africa (FAOSTAT 2012).

Table 4. Palm oil and groundnuts production and consumption trends in West Africa 1990-2010

	Palm oil production	Groundnuts production (with shell)	Groundnuts yields	Palm oil consumption	Groundnuts consumption
1990	1.2 MT	2.6 MT	978 kg/Ha	1.1 MT	2.4 MT
2000	1.5 MT	5.2 MT	1132 kg/Ha	1.6 MT	5.4 MT
2010	2 MT	6.4 MT	978 kg/Ha	2.7 MT	6.4 MT
90-2000 AAGR	2.3%	7.2%	1.5%	3.8 %	8.4 %
2000-10 AAGR	2.9%	2.1%	-1.5%	5.4 %	1.7 %

Source: FAOSTAT (2012); AAGR: average annual growth.

d) Livestock products

The livestock sector occupies an important place in West African economies. The region has about 25 percent of the cattle in sub-Saharan Africa, 33 percent of the sheep, 40 percent of the goats and 20 percent of the camels (Mulumba *et al.*, 2008). The share of animal production in agricultural GDP ranges from 5 percent in Côte d'Ivoire to 44 percent in Mali. In the landlocked countries of the Sahel, the contribution of livestock to agricultural GDP is 40 percent.

Animal production systems can be roughly divided between purely pastoral systems, livestock mixed with farming, and small ruminant rearing. Pastoral systems account for a third of the cattle and half of the small ruminants, but supply 60 percent of cattle meat, 40 percent of small ruminant meat and 70 percent of milk. Agropastoral or mixed small farming systems are expanding, relative to purely pastoral systems. Rearing of monogastric livestock plays an important part in the economies of the coastal countries. In this regard, West Africa is the main producer of pig meat on the continent, with Burkina Faso, Cameroon and Nigeria leading the way. Pig meat production has undergone major growth since 1980, rising from 106 000 tonnes in that year to 330 000 tonnes in 2005 (Mulumba *et al.*, 2008). Poultry production (broilers and eggs) has experienced a similar pattern of growth over the last two decades, starting from slightly more than 300 000 tonnes in the early 1990s, increasing to 495 055 tonnes in 2007 and 551 386 tonnes last year (FAOSTAT, 2012).

However, regional production of meat and dairy is still far from meeting the increasing demand from population and urban growth. By 2015, demand is estimated to reach 3.5 million tonnes for meat products (from cattle, small ruminants, poultry and pigs) and 4.5 million tonnes for dairy products. While production has doubled since 1961, with an annual average growth of 2 percent, progress has been erratic, oscillating between periods of growth followed by years of decline (2.2 percent in 1971 and 1975 and 5.0 percent between 1986 and 1989). The region is also uneven in terms of livestock production per capita. Although Nigeria produced 280 000 tonnes of meat, or 33 percent of regional production in 2005, at country level this represented only 2.13 kg per inhabitant, a per capita production lower than the regional average (Mulumba *et al.*, 2008). In the Sahel countries, annual per capita beef and veal production is higher than in Nigeria (8 kg in Burkina Faso, 7 kg in Mali and 6 kg in Niger). Dairy production per head of cattle is low compared with potential. Gonçalves (1995) estimated milk yields to vary from 0.5–2 L per day, depending on the breed, style of livestock management and milking method. It was generally accepted that breeds yielding 0.5 L per day could produce more than 2 L with management and feed improvements (Agyemang *et al.*, 1997).

The West African region is recognized as a reservoir of great genetic diversity, with multi-functional livestock rearing. About 13 cattle breeds of the shorthorn type and 12 of the zebu type have been recorded in the region. Yet the intrinsic zootechnical characteristics of small ruminants, poultry and pigs are not well-documented, even as their genetic diversity and the potential for increasing their meat yields (from large animals) and milk yields (from sheep and goats) are undisputable (Gbangboche *et al.*, 2005).

Protein consumption required for minimum daily nutrition is far from being met on average in the region. The minimum calories required by a 65 kg person in a situation of food security is 2 400 kcal (the norm established by FAO), which is generally supplied by cereals and roots and tubers. The diet should also include at least 55 g of protein for the well-nourished –although it can be as low as 17 g for the less affluent. At the regional level, however, per capita daily consumption is about 2 320 kcal, lower than the FAO norm. Moreover, protein deficiency is more widespread in the coastal countries, where the typical diet contains only 45 g of protein, as against 60 g in the Sahel countries.

Intraregional trade in livestock is insufficient considering its potential, but generally follows a flow from landlocked Sahel countries towards the coastal areas. West Africa can be divided into three large blocks: (i) the

countries of the Gulf of Guinea (Benin, Cameroon, Côte d'Ivoire, Ghana, Nigeria and Togo), the countries on the Atlantic seaboard (the Gambia, Guinea, Guinea Bissau, Liberia, Mauritania, Senegal and Sierra Leone) and the land-locked countries of the Sahel (Burkina Faso, Chad, Mali and Niger). Apart from Nigeria, the countries on the Gulf of Guinea are net importers of livestock products, those on the Atlantic seaboard trade very little among themselves, and the land-locked countries basically supply those on the Gulf of Guinea (except for Cameroon) with products from the beef and veal commodity chains. For example, between 2000 and 2003, Mali exported close to 6 500 tonnes of live cattle to Senegal (valued at CFAF 5.75 billion or over 12 million USD) and 16 617 tonnes to Côte d'Ivoire (valued at CFAF 11.84 billion or over 25 million USD).

3.3 Crop productivity trends

A. Soil fertility

Tackling the soil fertility problem is a key prerequisite for rebuilding West Africa productive potential. More than half of food production in the Sahel countries is composed of sorghum and millet, two cereals typically grown in dry areas. As soon as rainfall is higher or when irrigation is possible, these crops are replaced by maize or rice, crops more preferred by urban consumers.

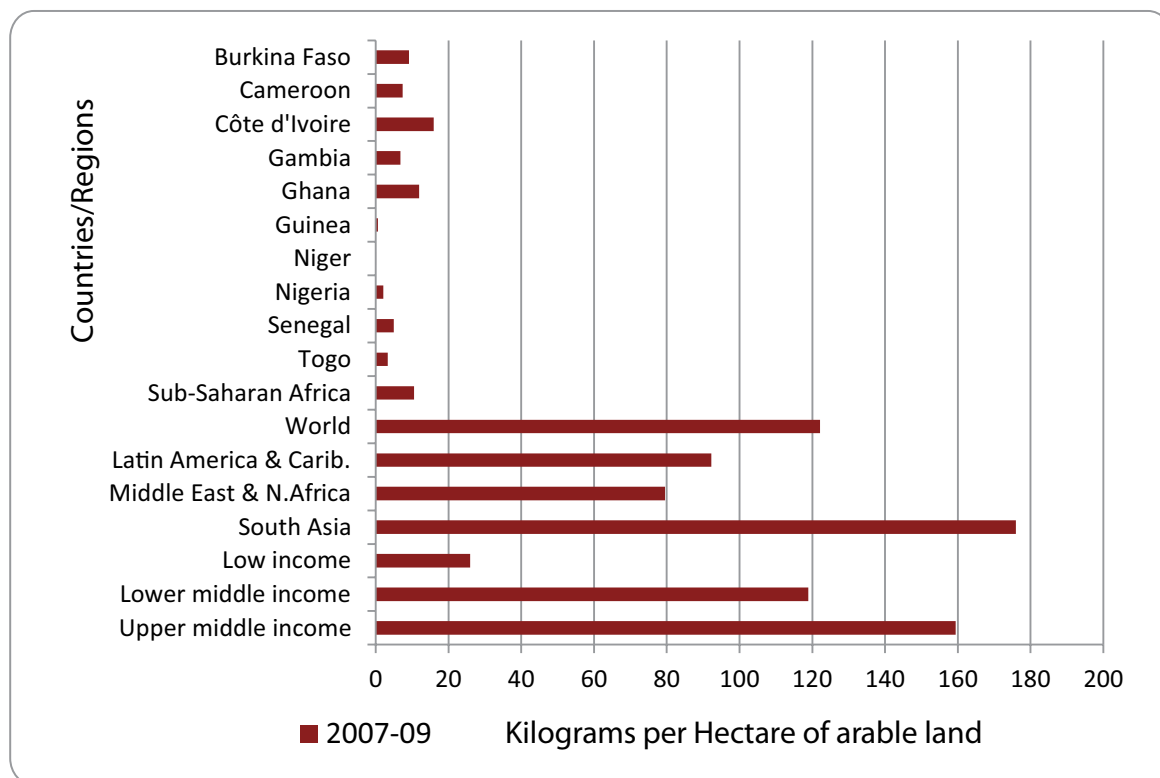
Soil fertility trends in the region are a cause for concern. From the agro-ecological perspective, the production of millet and grain sorghum, particularly in the Sahel, has historically developed on the lighter soils of the region (e.g. the groundnut basin of Senegal, the Maradi zone in Niger) which provide several advantages, such as reducing manual fieldwork hardship, simplifying the preparation of land and allowing for early planting (Jouve, 2012). But their main advantage lies in the water retention properties of these soils, a result of the sandy texture, which limits direct evaporation, minimizes runoff and optimizes the absorption of rainfall and depth to store almost all rainwater. All these properties have helped these soils adapt to the aridity and favoured crops like sorghum and millet. The downside is that soil fertility is very fleeting and decreases precipitously after a few years of cultivation, resulting in a reduction in crop yield. These sandy light soils have a low content of clay humus complex – an important source of minerals that can be released into the soil for plant use and nourishment. This clay humus/mineral deficiency depletes these soils of needed fertility rather quickly after a few years of cropping which can show up in lower yields. The concern is that this is not an isolated situation but covers a large swath of cultivated lands in the region.

When population density was low, farmers could practice long fallow periods (leaving the land to rest from cropping), which allowed soil fertility restoration. But this is no longer possible, due to mounting population pressures and resulting expansion of cultivated lands. As less and less fallowing is practiced, the change is reflected in increased rates of soil fertility loss and consequently in the negative impact on yields (Jouve, 2012). Alternative soil fertility management strategies are required if yields are to increase or be maintained. Such management of soil fertility would ideally combine mineral and organic fertilizers. New methods of fertility restoration would include cereal-legume association, application of manure or compost and the introduction of trees in the cultivated area. These practices are known and already practiced on a small scale by farmers, especially near their farms (thus giving these management systems an intensive character). But the bulk of cultivated land is not affected; consequently, for much of the land, there is a regressive evolution of fertility resulting from lower yields.

The use of fertilizers is essential, especially phosphate for which soils are generally deficient. Similarly, the addition of nitrogen has a quick and positive impact on the increase in biomass and yield (as shown by tests conducted by FAO, ICRISAT, and IFDC). However, soil fertility cannot be managed solely through continuous input of mineral fertilizer, as this can cause the acidification of soils over the long term. It is also necessary

to use other methods of managing this endogenous fertility. Given the low levels of fertilizer use in West Africa (as shown by Figure 17 below), there is still more scope to improve fertility through use of a judicious management system.

Figure 17. Fertilizer consumption in West Africa, 2007-2009

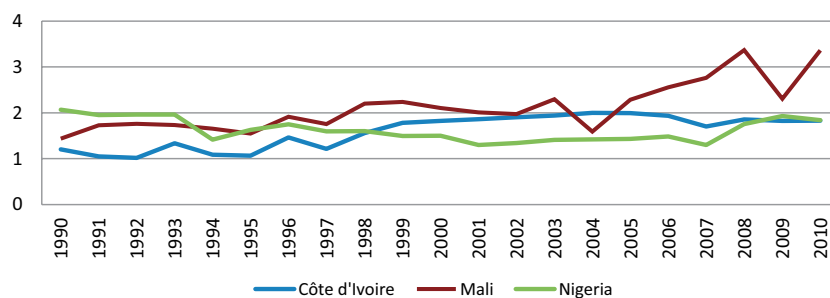
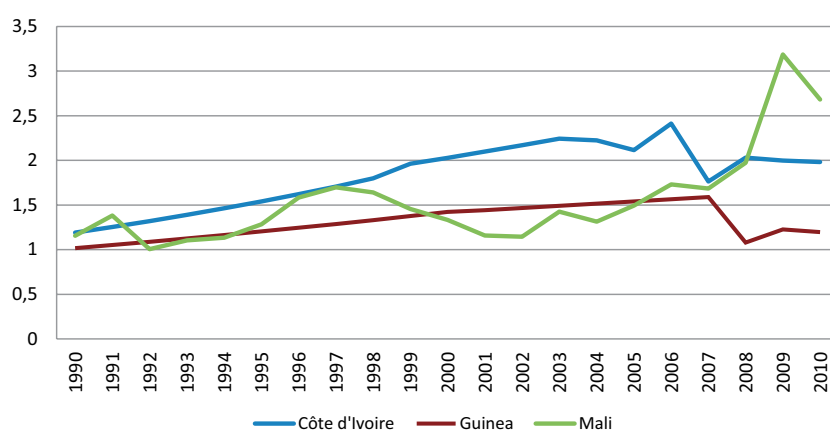
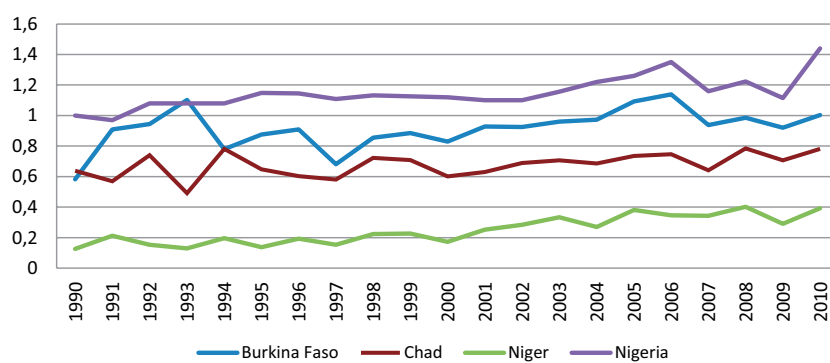
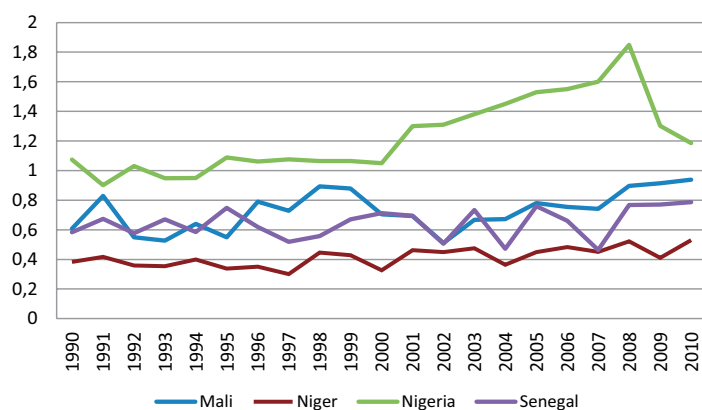


Source: World Bank; World Development Indicators

B. Staple crop yields

i) Cereals

Cereal yields in the region can easily double if soil fertility is improved. This necessarily requires improving access to inputs, and thus to credits. Such a yield boost also requires finding ways to minimize climate risks to production in dry areas, such as improving individual and collective storage, as well as stabilizing prices, given that price variability is the main economic risk confronting the small farmers of the region.

Figure 18. Cereal yield trends in West Africa**A. Paddy rice yield (tonnes/ha)****B. Maize yield (tonnes/ha)****C. Sorghum yield (tonnes/ha)****D. Millet yield (tonnes/ha)**

Source: FAOSTAT (2012)

Figure 18 shows the cereal yield trends for the main crops since 1990. Overall, rice yields stagnated over the last two decades and only picked up in the last four years (following the food crisis of 2007/08). Côte d'Ivoire, a big rice producer in the region, experienced no yield changes over the period; however, notable yield increases were observed for Nigeria and the most notable yield increase was in Mali. Typically, rice yields vary from 1 tonne to a little under 4 tonnes per ha, depending on the performance of irrigation and lowland cultivation techniques (ACI 2011).

For most countries, maize yields have also stagnated since the 1990s. Côte d'Ivoire experienced a maize yield boost for about five years during the second half of the 1990s but then yields stagnated after that. Mali, by contrast, has experienced a slow yield improvement since 2002 and a sharp yield boost since 2008, after the launching of a national maize initiative with distribution of inputs, notably fertilizer, which markedly affected maize yields.

Sorghum yields are very low, below 1 tonne per ha for all countries except Nigeria, whose sorghum yields are also quite low, as they remain below 1.4 tonne per ha. Yields elsewhere are also low and highly variable, with no noticeable trends since the 1990s.

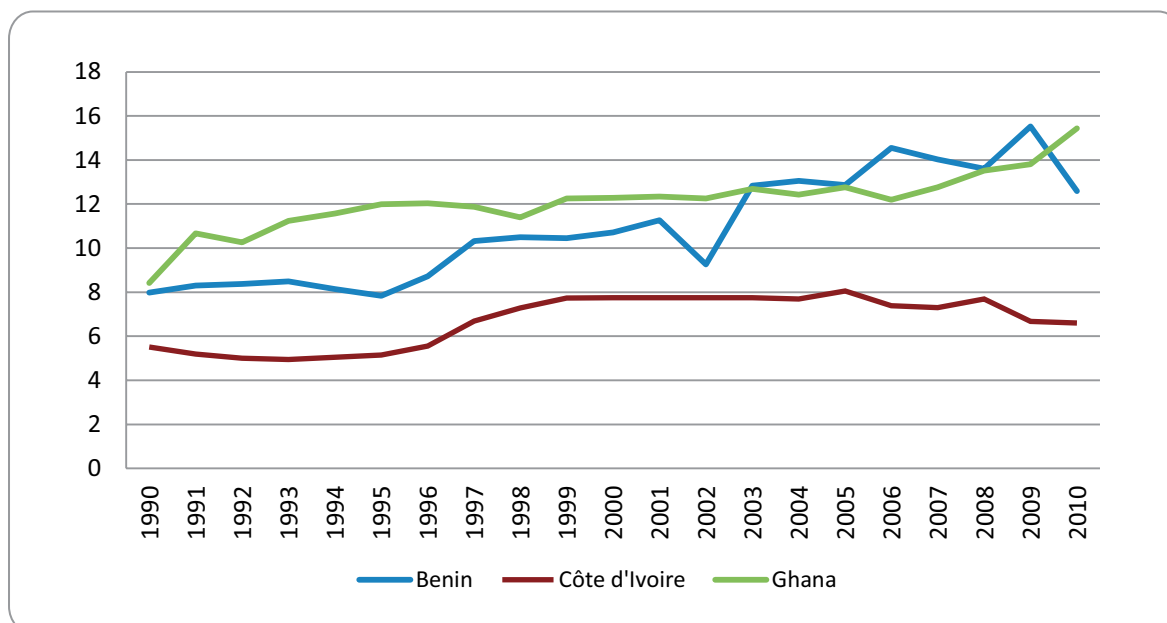
Millet yields are low and stagnant; most are below 1 tonne per ha (except for Nigeria). One of the region's top producers, Niger, averages only 0.5 tonne per ha. The other big producers (Mali and Senegal) have yields that are stagnated between 0.5 and 1 tonne per ha.

With these low yields it is very difficult to contemplate development of a value chain with marketable surplus leading to processing opportunities. The key challenge remains low yields; however, given the yield gaps, the potential for growth is huge.

Overall, there has been little yield improvement in millet or sorghum during the last decades, due to the near absence of public investment in R&D. These commodities (millet, sorghum and maize) have not been considered a priority for investments despite their huge role in food security for rural households, which makes them, on aggregate, among the top crops in the region.

ii) Roots and tubers: Cassava

The average yield for cassava in the region has hovered unchanged at around 10 tonnes per ha for much of the last two decades; it only rose a bit in the last few years to reach around 12 tonnes per ha. This is still far below the average yields obtained with new varieties, which can reach between 20 and 30 tonnes per ha in rainfed conditions and up to 60 tonnes per ha under irrigation. On a country basis, two of the top producers have been making steady progress in average cassava yields: Benin and Ghana. Nigeria has also increased cassava yield in recent years but the new average of 12 tonnes per ha is about the same as it was in 1990. Côte d'Ivoire, a large cassava producer by contrast, has made no significant progress in its cassava yields, which continue to hover around 8 tonnes per ha.

Figure 19. Cassava yield trends (tonne/ha)

Source: FAOSTAT (2012)

In conclusion, those general patterns hide not only many disparities between crops but also among countries and production basins, depending on the feasibility of irrigation, quality of extension and R&D services, accumulation of farm and human capital, and availability of agricultural inputs. More importantly, substantial and sustainable productivity increases are required in value chains for all staples, in order to catch up with other developing countries and respond to future projected demand at both regional and world levels.

4. Staple food trade in West Africa: A general overview of trends

In light of the significant, often undocumented, informal trade and commodity exchanges across borders within West Africa, it was deemed necessary to treat formal trade flows separately from informal ones.

4.1 Formal trade flows

In this general overview we review trade flows, separating those flows within ECOWAS from those taking place outside the region. Looking at trade statistics as summarized in Table 5, we see that the food import flows into the ECOWAS region are largely dominated by extra-regional exporters. Table 6 summarizes trade for rice, maize, oil palm, groundnut oils, poultry and cassava, within and outside the ECOWAS region and focusing on a few key countries, namely Burkina Faso, Côte d'Ivoire, Ghana, Mali, Nigeria and Senegal.

Table 5. Trade flows for six strategic commodities in six key ECOWAS countries

Country / Region	RICE ¹		MAIZE				GROUNDNUT	
			Seed		Maize Products			
	ECOWAS	Rest of World	ECOWAS	Rest of World	ECOWAS	Rest of World	ECOWAS	Rest of World
To: ECOWAS								
1997-00	2.511	307.002	1.829	13.936	155	5.232	356	509
2001-04	8.500	719.620	5.086	18.863	457	13.779	233	2.192
2005-08	14.757	1.470.369	3.106	45.839	563	29.102	770	3.852
To: Burkina Faso								
1997-00	0	0	0	0	0	0	0	0
2001-04	3.248	34.782	654	20	156	510	47	32
2005-08	9.563	59.930	430	111	21	781	7	0
To: Cote d' Ivoire								
1997-00	0	0	0	0	0	0	0	0
2001-04	3	167.399	21	1.175	0	4.866	6	19
2005-08	1	334.886	2	3.457	58	8.200	6	35
To: Ghana								
1997-00	0	0	0	0	0	0	0	0
2001-04	0	117.295	0	66	0	970	243	39
2005-08	1.669	156.803	42	9.499	75	627	26	16
To: Mali								
1997-00	927	16.775	62	1	15	793	67	17
2001-04	2.108	24.768	266	32	5	796	36	167
2005-08	4.409	48.502	734	223	215	1.658	482	420
To: Nigeria								
1997-00	3.270	110.960	0	20	828	528	194	26
2001-04	1.639	222.935	0	1.335	2.825	3.047	11	86
2005-08	768	332.770	0	127	3.285	9.549	0	333
To: Senegal								
1997-00	5	137.649	74	5.104	1	920	0	5
2001-04	0	196.709	0	11.610	50	1.199	0	714
2005-08	0	396.995	0	23.847	7	2.728	179	1.029

Source: WITS - Sept. 2010

Note: " 0 " imply a minuscule value; ¹ Rice : Paddy + milled rice; ² Cassava: cassava products (starch).

Table 5. Trade flows for six strategic commodities in six key ECOWAS countries (Cont.)

Country / Region	PALM OIL		CASSAVA ²		POULTRY			
					Live Poultry		Poultry Meat	
	ECOWAS	Rest of World	ECOWAS	Rest of World	ECOWAS	Rest of World	ECOWAS	Rest of World
To: ECOWAS								
1997-00	28.592	8.340	59	45	21	1.117	196	36.469
2001-04	41.347	51.115	21	222	151	2.017	552	121.218
2005-08	56.789	85.722	77	721	18	4.572	316	149.686
To: Burkina Faso								
1997-00	0	0	0	0	0	0	0	0
2001-04	3.452	1.136	0	0	20	63	8	25
2005-08	12.820	642	0	0	13	82	15	20
To: Cote d' Ivoire								
1997-00	0	0	0	0	0	0	0	0
2001-04	7	15.549	0	0	0	704	46	9.351
2005-08	3	5.151	55	1	0	1.168	15	4.454
To : Ghana								
1997-00	0	0	0	0	0	0	0	0
2001-04	1	13.897	0	3	0	941	18	35.627
2005-08	205	25.063	0	100	8	2.713	33	59.145
To : Mali								
1997-00	843	119	0	0	12	39	7	27
2001-04	4.639	1.024	0	0	7	36	40	117
2005-08	20.874	3.675	1	0	0	152	37	212
To: Nigeria								
1997-00	204	1.501	0	0	0	931	0	13.244
2001-04	649	10.910	0	49	0	462	338	33.882
2005-08	560	3.076	0	76	0	0	159	49.545
To: Senegal								
1997-00	878	5.149	2	44	0	280	0	2.062
2001-04	7.670	5.654	4	68	0	175	0	17.296
2005-08	21.012	19.164	10	397	0	263	0	11.578

Source: WITS - Sept. 2010

Note: " 0 " imply a minuscule value; ¹ Rice : Paddy + milled rice; ² Cassava: cassava products (starch).

In the case of rice, we have seen that consumption and food demand in the region far exceeds local production. Rice imports into the ECOWAS region have continued to expand substantially from all sources during the last 12 years, with the rest of the world (primarily Asia) dominating imports in the most recent period. Some countries (Burkina Faso and Côte d'Ivoire) became rice importers only after 2000. It is worth mentioning that these reported import flows reflect only the commercial rice imports and exclude food aid, which can be substantial in the region.

Rice import sourcing varies by country depending on whether the country is on the coast or landlocked. Burkina Faso and Mali depend more on intraregional trade and have expanded rice imports from ECOWAS⁶, while coastal countries like Senegal import directly from overseas, importing only a small amount from within the region. Nigeria's rice imports, on the other hand, decreased as a result of policy decisions (import bans).

Maize production is far more significant within the region than rice and the region could very well be self-sufficient. Maize imports are dominated by primary production (seeds) for direct food consumption, with very little trade in semi-processed (flower) and processed maize (starch). There has also been a huge increase in seed maize imports from outside ECOWAS. However, the rest of the world dominates the semi- and fully-processed maize markets. Landlocked countries like Burkina Faso and Mali depend more heavily on the ECOWAS region for their maize seed imports than coastal countries like Côte d'Ivoire and Ghana, which import more readily from outside the region.

Substantial increases in poultry and egg imports from outside ECOWAS to meet the growing demand in fast-expanding urban centres is a recent phenomenon that is puzzling, given the huge potential for home-grown production. This seems to point to a huge, untapped domestic poultry industry, especially if it were fully integrated with the cereal systems that dominate in the region. For the time being, consumer demand is met through imports of live poultry, especially from Europe. Looking at production and trade trends, we see that only two countries have made any significant move to expand poultry production, namely Côte d'Ivoire and Ghana. Nigeria, has tried to restrict imports (the only import level that declined within the region for the period analysed) through restrictive import policies. Nigeria imposed a ban on imports for a large number of food products in order to stimulate domestic production. For semi-processed and processed products, there was a huge import expansion for the other ECOWAS countries from both Europe and the rest of the world. All these developments may indicate a huge potential for more integrated, large maize-poultry systems within the region. However, for this to happen, the existing bottlenecks relating to energy (electricity), cold storage facilities and transport costs would need to be overcome.

Within the vegetable oil complex, oil palm has both strong official and unofficial intraregional trade, especially in crude palm oil, the form most used for food consumption in Africa. Nigeria dominates the region in imports of primary products (palm nuts and kernels), while very little is imported by other countries. For palm oil (processed), the data show an explosion of imports from the ECOWAS region into many countries, such as Burkina Faso, Mali and Senegal, which import palm oil from coastal countries of West Africa, especially Côte d'Ivoire. Nigeria has expanded production of oil palm, resulting in less reliance on imports. Groundnut oil, the second most important vegetable oil in the region, has also showed increased imports into the ECOWAS region, with Mali and Senegal importing relatively more than the other countries. On the export side, Senegal dominates the market, with continued groundnut oil exports to the rest of the world but only minimal exports to other ECOWAS countries. In many countries, local production and processing account for a large share of domestic consumption.

⁶ There is also a large informal rice trading across neighboring countries led by informal traders who move (smuggle) rice across borders from low-tariff countries into highly-protective ones and escape from customs' control.

Primary cassava (tubers) is exported from the ECOWAS region into Europe, largely to serve the African diaspora. More intra-ECOWAS trade takes place in primary cassava. Only Côte d'Ivoire exports processed cassava from within the region. Countries like Ghana, Nigeria and Senegal import processed cassava (starch) mostly from Asia or Latin America. Given the huge production potential of cassava in the region, importing cassava starch points to a very weak agroprocessing industry, and hence to the still untapped potential for value chain development in this crucial regional food crop.

In summary, this very succinct review of food import patterns into and from the ECOWAS region points to two broad conclusions. First, there is clear evidence of the poor agroprocessing capacity of the region as a whole, with respect to the major food products produced, consumed and traded. This explains the much higher reliance on imports than the potential or comparative advantages would seem to indicate. Second, the fact that coastal countries (Côte d'Ivoire, Ghana, Senegal) import more from outside while landlocked countries import from within the region points to significant transport and infrastructure bottlenecks impeding regional trade.

4.2 Intra-regional trade in staple food

Low intramarket integration, as is still the case for West Africa, translates into more price variability and more uncovered risk for producers, as well as for traders and other stakeholders. Hence, when intraregional markets are underexploited, marketing opportunities are weakened, creating disincentives for regional investments. Conversely, expanding intraregional trade in food value chains can provide significant spillover to the local economies and create a regional market for high-end products.

The institutional setup for market and economic integration in West Africa has been in place since 1993, when ECOWAS was established to promote a free trade area within West Africa and push for a free circulation of goods and services and preferential agreements for investments and migration (UNCTAD, 2009).⁷ ECOWAS created a customs union for the whole region, building on the regimes in existence in the West African Economic and Monetary Union (WAEMU). It is the one region in Africa that has managed to put in place, at least officially, free mobility of goods, services and factors of production. However, in practice, there are still numerous barriers to translating such a commitment into a reality.

Among these are the effects of geography. Landlocked countries are particularly vulnerable as they are still tied to trade outside of ECOWAS but face poor infrastructures and other burdensome non-tariff barriers. As a consequence, these countries incur the costs of crossing the borders of their neighbouring countries (over which they have no control) in addition to their own, which results in high trade costs. Another key determinant affecting regional integration is the "Colonial Pact" signed by the French-speaking countries, which mandates France to have complete oversight of 60 percent of their financial reserves and euro-peg of the African Financial Community (CFA), which ties these economies with European macro-economic cycles (i.e. inflation, interest/exchange rates). Successful economic and monetary integration under such conditions is difficult.

Another factor impeding greater intraregional trade integration is the general category of transaction costs, which include weak attraction forces (cultural, historical, geographical) and strong opposing forces, such as cumbersome, slow trade procedures and informal taxation at the borders as non-tariff barriers. Administrative procedures can also be very costly, as shown by the World Bank data (2009); import/export procedures are

⁷ Within ECOWAS, the WAEMU represents the French-speaking countries with a common currency (the CFA Franc), harmonized business law, and some convergence among macroeconomic policies. There is also the WAMZ which groups together the non-CFA currency countries.

more time-consuming and costly (with more documents) than in any other region in the world. Many causes can be invoked: electronic breakdowns, poor capacity and coordination in the inspection services, red tape, delays in duty refunds and insufficient opening times, all of which lead to important delays.

The political will to leverage cross-border trade as an economic growth engine is still weak, in part because of lack of evidence credibly demonstrating the costs – to government budgets, private actors and to the local economy as a whole – that are arising from the various barriers to intraregional trade. As long as such cost/benefits analyses are not done in a credible and systematic way it will be hard to move political will in the direction of support. Recent projects in the regions, such as the USAID/ATP project to promote regional trade (see box 2 below), contribute to fill this huge data gap. Moreover, there is a widespread perception that restricting cross-border trade is good for domestic food security, especially in drought years or deficit-production situations. Yet another factor is a persistent widespread mistrust and lack of credible dialogue between policy-makers and the private sector, which has often resulted in trade restrictions, such as export bans.

Box 2. Enhancing regional trade and value chains: the USAID Agribusiness and Trade Promotion project

Regional trade has always existed and been significant in West Africa but in a mainly informal way and actual figures and statistics are difficult to cover. Since 2008, USAID has been funding the Agribusiness and Trade Promotion (ATP) project in the region, aimed at increasing the volume and value of formal intraregional trade in selected commodities, especially staple foods such as maize, livestock, rice and millet/sorghum, as well as onion. This project has brought more knowledge about actual trade into the region, including in its informal aspect, and has examined the different constraints that hamper regional trade in West Africa, as well as the actual trade flows in the region. This has contributed to the clear identification of trade constraints at the farm level, at the transport and infrastructure level, in the linkages between and among actors, and at the policies and regulations level.

The project contribute to data collection for a long period and at the market level. The project has begun implementing solutions to address these issues and facilitate a more official and formal trade, based on higher predictability, better transport logistics and open markets. These efforts involve: capacity building and training efforts at the farm level to improve the use of technology; building human and institutional resources; promoting transportation improvement; improving market information systems; and facilitating policy development.

The project also relies on partnerships with local and regional organizations such as CILSS, WAEMU and ECOWAS for data collection purposes and also to collaborate on efforts to address the above-mentioned constraints. This will also enhance the sustainability of these efforts beyond the end of the project and its related funding as these organizations would supposedly continue with data collection on a long-term basis.

5. Staple food value chains in West Africa: Selected priority issues

In this section, we will review a few of the key issues for upgrading selected staple food value chains in West Africa, focusing on priority measures and initiatives most linked to enhanced competitiveness and inclusiveness. Except for poultry, each of the commodity chains described in this section is treated in more detail in later chapters of this volume.

5.1 Rice

In several countries of the region, the rice value chain offers a strong potential for growth and expansion if it can be sustained by renewed investments in rural infrastructures, improved access to production, storage and marketing financing, and enhanced organization of producers to upgrade the quality of produced rice supplied to the market. Many limitations continue to hamper the competitiveness of the sector, including limited industrial processing facilities and outdated irrigation infrastructures.

For the rice value chain, much of the development potential hinges on the capacity of producers and processors to improve productivity through higher yields (via irrigation schemes) and to upgrade the quality of rice to consumers, all of which could improve the competitiveness of local rice relative to imports. Recent policy-led efforts devoted to production enhancement are beginning to bear fruit (e.g. distribution of the higher-yielding NERICA variety). However, less attention has been given to post-production activities (processing and marketing). This has resulted in an unbalanced effect of increased production, which shows up in lower producer prices and results in disincentives for continued rice production. A major concern is the low quality of local rice, and the high level of impurities in paddy rice, which persist throughout the processing stages up to the final product, resulting in a discounted price that keeps local rice less competitive. Linked to this constraint is the lack of organizations and market-savvy producer groups that could ensure better quality of locally-produced rice and defend coherent policies that would level the playing field between domestic and imported rice. By contrast, rice importers tend to be well organized, sufficiently informed about prices and capable of exerting effective political lobbying for open import policies. Moreover, the lack of effective reliable and timely information systems (with credible information on stocks and production shortages by locality) hinder appropriate policy decisions regarding rice imports. Consequently, enhancing the penetration of local rice into urban markets remains a major challenge.⁸

5.2 Maize

Maize offers huge potential, not only as a multi-market value chain (food, feed, industrial use) but also for greater intraregional trade and for building up value chain linkages with the nascent poultry sector. Increased maize competitiveness starts with improved productivity through yield increases. The low average yields suggest the possibility of yield improvement even with existing technologies, provided that an efficient system of quality distribution and good soil fertility management are achieved. Fertilizer use is key to boosting maize yield and a proper strategy (not centred on the inefficient policy of fertilizer subsidy) is urgently needed, which requires the development of an effective input market that can assure fertilizer availability and access for maize producers. Such a strategy must also include a quality control system, as

⁸ For detailed treatment of productivity-enhancing initiatives, see Chapter 13 for Mali; Chapter 12 examines rice in Senegal and addresses the quality problems facing local rice; Chapter 5 examines how, also in the case of Mali, policies and investment choices can hinder rice producers even when a government intentionally commits to promoting domestic rice production.

well as extension and farmers' field schools to educate farmers on the proper use of fertilizer. More critically, such a strategy needs to address the credit-input linkages and encourage market-oriented schemes, such as warrantage, to overcome the credit access problem. Whether maize is grown within the cotton-cereal systems or outside them (as with maize-cassava), the maize value chain has such a huge potential that it needs to come into its own with a development strategy that combines with development of the poultry sector and enhances intraregional trade of this regionally-strategic commodity.

Following the food crisis of 2007/08, many West African governments have turned their attention to maize development, seeing in maize a coveted target to enhance food security. To address the credit-input deficit, several private-public, tripartite initiatives for credit facilitation were initiated. Such an initiative involves three partners: the government (through a funding donor), a locally-based micro-finance institution and a well-established farmer organization representing beneficiary farmers. Moreover, other schemes, such as inventory credit (warrantage) are being promoted in West Africa; cereal-based farmers' organizations (in Burkina Faso, Mali and Niger) have been among the early adopters. The maize value chain and its professional organizations need to be developed from the ground up. Another goal for maize value chain development is to reinvigorate the role of interprofessions that cover all the maize value chain players including end users (such as animal feed producers). The legal frameworks or bases for these private sector-led, value chain-specific interprofessions have been progressing in the legislatures of many countries. However, a legal framework is only the first step, as the proper functionality of such interprofessions can evolve along with the structuring and the development of the maize value chain itself⁹.

5.3 Poultry

Demand for poultry products is growing rapidly in the region, as urbanization and changing consumer preferences evolve. However, the poultry value chain is still in its infancy and faces various challenges. The value chain has a very low productivity, especially in rural areas and for traditionally-bred chicken, with inefficient production practices and weak veterinary services exerting a negative impact on the quality of the production and the marketability of the products. At the downstream end of the value chain, storage facilities are very limited, while transport and global infrastructures are still underdeveloped. The well-known border corruption and red tape obviously impede regional trade in poultry, allowing easy imports of products to capture the fast-growing urban markets. Poultry product imports from Europe have expanded, particularly since the implementation of the Common External Tariff (CET) within the ECOWAS. For the domestic poultry sector, market formality is precarious, due to lack of information services, as well as difficult access to credit. The environment for the value chain is also quite unfavourable, with weak government policies in support of the livestock sector in general and poultry, specifically; even when such support is provided, it is generally badly-implemented.

Broadly speaking, two poultry production systems coexist: (1) traditional production for self-consumption or local markets; and (2) modern poultry production serving the urban centres. The latter system is expanding very fast but from a very low starting base. Coastal countries (e.g. Côte d'Ivoire) have more developed poultry value chains than landlocked countries (e.g. Burkina Faso), which experience difficulties exporting to neighbouring countries because of quality standards or lower protein content (maize, sorghum) requirements. For poultry, non-tariff barriers play a bigger role in hampering intraregional trade, which is minimal, despite the potential zero tariffs within the region.

Given this strong competition with imports, development of domestic production requires complementary border measures. The application of import restrictions on poultry in Senegal and Nigeria has played no small part in allowing the growth of domestic production. The question is whether the local

production of chicken and eggs has achieved or can achieve efficiency gains to withstand external competition on its own. However, the challenges are daunting and need tackling.

On the positive side, the poultry industry is relatively well-structured, with strong growers' unions and interprofessional bodies that can play an important role in the future development of poultry regional value chains. Spillover effects on other sectors are numerous, illustrated by the benefits of regional integration of several countries in reproduction, feeding, slaughtering, equipment and agricultural by-products. The policy framework can be improved to harmonize protection levels within the region. Policies should also be more conducive for the poultry sector, with strong biosecurity standards and norms, better infrastructure for trade and market access and access to financial resources for smallholders. Moreover, best production practices, including dimensions of biosecurity, should be disseminated among the poultry producers in the region to ensure a higher productivity.

5.4 Cassava

Cassava is a major staple food crop for much of West Africa south of the Sahel. Like maize, cassava and its related products cover a wide range of value-added food products, including flour, starch, glues and biofuels. In addition, the development of the feed sub-sector and downstream linkages with poultry and beef sectors are important market outlets for cassava throughout the region. Like maize, cassava can also play a major role in regional trade and food security, given the broad consumer base in the region. The cassava value chain can briefly be described by the following characteristics: (a) it has multiple final products; (b) it is a highly perishable crop needing immediate processing to produce widely marketable products; (c) it is harvested as a tuber and can be consumed directly on-farm; (d) it is largely produced by small-scale farmers, especially women; and (e) it is a low-value raw crop made essentially of starch. However, the potential for cassava value chain development is huge, with many still untapped opportunities in the value chain, starting from the dried cassava subsector, the flour and feed subsectors and growing demand from supermarkets and the bakery industry.

However, cassava value chains are far less developed in much of West Africa compared with major Asian producers (India and Thailand). Being a traditionally self-consumed crop, cassava production continues to languish under low yields and underdeveloped value chains, lacking fully-developed processing and marketing channels. Traditionally, this crop has not received the attention it deserved from governments and relatively little has been invested in the crop, especially in the much needed R&D of new varieties to boost yields and new technologies to improve processing, especially for small-scale producers and groups. Women play a big role in cassava production, traditional processing and marketing. Recent development initiatives targeting cassava in the region have demonstrated the potential productivity improvements for this crop. The introduction of new cassava varieties in Cameroon as part of an IFAD-funded development programme resulted in significantly increased yields, offering a potential for surplus production to be channelled for agro-industrial processing. However, increasing production for a bulky crop, which is not easily stored, poses problems if no parallel advances in processing and marketing are developed simultaneously.

A coherent development strategy for the cassava value chain needs to be centred around a network of small-scale processing facilities that can receive surplus production. Besides a variety of final food products, cassava-derived animal feed and starch for industrial applications will form strong demand-pull forces. A number of differentiated cassava value chains can develop. These can include: dried cassava production for local markets and cross-border trade; high-quality cassava flour for food and industrial production; and animal feed products for regional markets. For the dried cassava value chain, the performance of farmers' organizations (for bulking, storage, and marketing) is a crucial factor for success. In the cassava flour value chain, the

main bottleneck is quality assurance and control that could be provided by an established leader in milling and packaging. Market linkages between millers and supermarkets/bakers constitute another important area for value chain expansion. For cassava-based animal feed outlets, logistical costs for management of huge quantities and competition from other commodity feed sources (maize, mostly) are important factors. While recent efforts have demonstrated the capacity for boosting cassava yields, the key challenge for the cassava value chain lies in the simultaneous development of processing and marketing of cassava by-products. A coherent development strategy is required, given that the majority of producers are small-scale, mostly women, often with rudimentary techniques and limited access to credit and necessary market information and know-how.¹⁰

5.5 Oilseeds

The oilseed sector has a lot of potential for growth, owing to the important and fast-growing domestic, regional and international demand for vegetable oils. The oilseed complex in West Africa is dominated by palm oil, groundnut and cottonseed. Niche markets include sesame, cashew, coconut and shea. For palm oil, the regional leaders are Côte d'Ivoire, Ghana and Nigeria, which together have the potential to meet the whole regional demand.

Like all other major commodities in West Africa, the agroprocessing of oilseed products continues to be limited compared with its potential. The oilseed complex has undergone a major transformation in West African countries over the past decades, characterized largely by a reversal of trade position from net oilseed exporters to net importers. Senegal, once a major producer and exporter of groundnut, has experienced an implosion of the sector and become a net importer of vegetable oils (palm oil, colza, and soy) far outpacing its dwindling groundnut exports.¹¹

The palm oil value chain is receiving increased attention both from national governments and investors. The key issue is how to ensure that palm oil value chain development is built on sound competitive foundations, as well as being inclusive of small and medium processors and effectively linking agroprocessing with small-holder producers. This can only be achieved through strong government policies that fully recognize the central role of the private industry but also build guarantees for smallholder inclusion.¹²

For niche oilseed markets, the scope for value addition is very large when comparing the potential with the current situation. For example, Burkina Faso is the world's top producer of shea nut, but less than 10 percent of exports are in the form of shea butter, due to lack of chemical extraction capability for processing, lack of packaging facilities and lack of organized interprofessions capable of tapping into the lucrative export markets of North America (World Bank, 2009), where shea butter prices are at least three times as high as in Africa – or even higher with quality assurance (USAID, 2004).

Finally, vegetable oil trade within the region is huge, tough, informal and not officially recorded, which raises transaction costs, uncertainty and time, and hence limits exchange compared with its potential. In general, and despite the strong complementarities in vegetable oil supply and demand among ECOWAS member states (with the exception of Benin and Senegal), intraregional trade in oilseeds continues to be hampered by a whole host of constraints, including policy uncertainty – such as when countries impose tariffs on their neighbours despite the existence of a common external tariff (CET).

¹⁰ Chapter 16 addresses the particular case of cassava value chain in Cameroon.

¹¹ See Chapter 2 for a section on Senegal's groundnut.

¹² Chapter 11 addresses this issue in the case of oil palm industry in Ghana.

6. Conclusion

This introductory chapter provided a broad survey of the demand and supply drivers affecting the growth and development of staple food systems in West Africa. On the demand side, the increased population, fast-growing urbanization and changes to consumers' preferences are affecting not only future food demand but also the composition, quality and form of the food to be consumed, and hence will influence the shape and scope of food value chain developments in the region. Also, as demand growth continues to outpace supply growth, reliance on imports is unlikely to abate and the only question is whether the pattern of food trade can shift significantly toward more intraregional trade or continue to depend largely on trade flows outside of the region. On the supply side, the lower productivity growth coupled with soil fertility challenges are posing serious obstacles to enhanced production potential in the region for the major food crops produced and consumed. Recent events (such as the food crisis of 2007/08 and its aftershocks) repositioned agricultural development to the centre of regional development strategy and West Africa could undertake its own Green Revolution. However, the path is not going to be easy and will require a judicious combination of policies, private initiatives and more effective producer engagement to ensure that targeted markets, value chains, and food systems are not only highly competitive but also inclusive of small-scale men and women producers, guaranteeing the widest distribution of economic returns and hence improved food security and reduced hunger. The following chapters in this book address this central issue in greater detail.

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