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The structure and growth pattern of agro-industry of African countries

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The structure and growth pattern of agro-industry of African countries

UNIDO Statistics Unit

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
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Table of Contents

List of Figures

List of Tables

1 Introduction

The agro-industrial sector comprises economic activities relating to manufacturing sectors primarily engaged in the processing of raw materials and of intermediate agricultural, fisheries and forestry products. The statistical indicators of the agro-industrial sectors measure the relative importance of these sectors for manufacturing and the country's overall economy. The production relationship between agriculture and industry is a key element for economic growth in Africa. Agriculture contributes up to 60 percent of GDP in some African countries. Development economists have emphasized the importance of production and consumption linkages between the agricultural and manufacturing sector since the onset of decolonization. Agriculture generates forward linkages with agricultural outputs being supplied as inputs into manufacturing. Fast growth in agriculture contributes to a rapid rise in agro-processing, which in turn provides new engines of growth as well as an opportunity to substitute imports. Agriculture also creates backward production linkages through its demand for intermediate inputs as well as capital goods such as agricultural machinery and equipment, which are crucial for raising productivity in the agricultural sector. Agro-industrial sectors comprise a number of manufacturing activities that have direct production linkages between agriculture and manufacturing.

The delineation of agro-industrial sectors is based on the supply-based conceptual framework underlying the International Standard Industrial Classification of All Economic Activities (ISIC). ISIC revision 3 is used to aggregate manufacturing activity into agro-industrial sectors. The compilation of statistics for this category requires the underlying data to be available at the 3-digit level of ISIC at least. The main intention in this regard is measuring the relative contribution of agro-industrial sectors to the value of the principle indicators of manufacturing such as production, employment and trade. Most of the agro-industrial sectors, albeit not all, are also resource-based. Therefore, agro-industrial sectors are characterized by low levels of technological innovation. As industrialization advances towards diversification and technology-intensive activities, the share of agro-industrial sectors tends to decrease.

In most developing countries, manufacturing is relatively dependent on agricultural supplies. Agro-industrial sectors account for around 15 percent of manufacturing value added in industrialized countries, yet their share in developing countries is much higher. The processing of agricultural supplies dominates the entire manufacturing sector in least developed countries (LDCs). Agro-industrial sectors accounted for 2/3 of the manufacturing output of LDCs in 2009. These activities also play an important role in absorbing surplus labour from rural areas and gradually transferring them to the manufacturing workforce. Rural industrialization

considerably accelerated manufacturing growth in South Africa and East Asian countries. This paper presents an overview of the agro-industrial sectors in selected African countries, explores these sectors' main production features and tracks the external trade flow routes of agro-industrial products and agricultural machinery. The paper includes an analysis of (i) the role of the agro-industrial sector in selected regions; (ii) exports of agro-industrial products, and (iii) agricultural machinery imports.

1.1 Purpose of the study

Industrial development has the potential not only to modernize sectors of the economy other than agriculture, construction and services, but also contributes to achieving a variety of social objectives such as employment, gender equality, maintaining labour standards and facilitating greater access to education and healthcare. The more developed a country's industrial capacity, the greater the potential for economic growth and human development. UNIDO as a specialized agency of the United Nations in industrial development aims to promote and accelerate sustainable industrial development worldwide, especially in developing countries. Its main activities include poverty reduction efforts, inclusive globalization and environmental sustainability. Statistics makes a significant contribution to the formulation of industrial development strategies for today's diverse world. Such strategies must be based on sound empirical evidence provided by reliable, accurate and internationally comparable statistics.

The economic literature provides clear indications that agro-industries have a significant global impact on industrial development and poverty reduction in both urban and rural communities. Agro-industry generates employment and income opportunities by providing work placements in both farming and off farming activities (FAO & UNIDO, 2008). The agro-industrial sector has gained a dominant position in manufacturing in a considerable number of countries and in promoting rapid economic expansion with beneficial effects on agricultural and rural development. In view of the global importance of the agro-industrial sector, special emphasis is given to the African region where, according to the African Development Bank, the agro-industrial sector is the single largest contributor to income and employment generation and plays a key role in dealing with the region's challenge to achieve self-sufficiency in food production, create supply chains, improve agricultural productivity and enhance the competitiveness of processed export products, reduce rural poverty and foster economic advancement based on sound environmental management practices. Moreover, the significance of agro-industrial exports from Africa to the international market should be highlighted considering that globally processed products account for 80 percent of food and beverage sales with 60 percent being consumed in high income counties (Wilkinson, 2008).

Agricultural mechanization is a component of agro-industrial development. It is the application of mechanical technology and increased power in agriculture, largely as a means to enhance productivity and often to achieve results well beyond the capacity of human labour (FAO/UNIDO 2008). The import of agricultural machinery plays a vital role in international trade and contributes to agricultural mechanization. Tractors, combines and smaller equipment such as seed rills are often shipped over considerable distances. Moreover, trade in used machinery also has an impact: machinery that is nearing the end of its economic life in one country may still be very profitable in another. The importing country should, however, consider the condition of the agricultural machinery it imports as well as adequate after-sales support.

Agro-industrial development is closely linked to agricultural mechanization. Many studies substantiate the strong correlations between economic growth and the mechanization of agriculture; countries that have achieved economic growth and resolved their food problems have also advanced to higher levels of agricultural mechanization, while countries with stagnating economies and extreme poverty have lagged behind in agro-industrial mechanization (Yumkella et al., 2011). Moreover, it is a widely held view that international trade (i.e. agricultural machinery imports) leads to faster technological diffusion and higher rates of productivity (Helpman, 1997). While this is of significance for all countries, it has dramatic implications for less developed countries as they seek to catch up with the technological leaders in OECD (Keller, 1999). Furthermore, according to Coe and Helpman (1997), foreign trade could be considered a carrier of knowledge in terms of the importance of imports in introducing foreign trade technology into domestic production and spurring total productivity.

1.2 Sources and methods

In this paper, the agro-industrial sector refers to a subset of the ISIC division pertaining to manufacturing activities involving the processing of raw materials and of intermediate agricultural, forestry and fishery products. The subset of the ISIC division underlines the inter-activity linkages where agriculture serves as a supplier of input and industry as the producer of consumer goods. Suppliers' activities include growing crops, raising animals, harvesting timber and other plants and animals on farms or from their natural habitats. In line with UNIDO practice, the category agro-industrial sector covers the following eight manufacturing industries:

- Manufacture of food and beverages
- Manufacture of tobacco products
- Manufacture of textiles
- Manufacture of wearing apparel
- Tanning and dressing of leather
- Manufacture of wood and wood products
- Manufacture of paper and paper products
- Manufacture of rubber products.

The paper also analyses imports of agricultural machinery by African countries which comprise the following SITC categories of machinery specific to particular industries:

i. Cultivating machinery (i.e. agricultural, horticultural or forestry machinery for soil preparation or cultivation; lawn or sports ground rollers; parts thereof)

ii. Harvesting machines, i.e. harvesting or threshing machinery including straw or fodder balers; grass or hay mowers; machines for cleaning, sorting or grading seed or grain or for grading eggs, fruit or other agricultural produce

iii. Dairy machinery and parts thereof, i.e. milking machines and dairy machinery, and parts thereof

iv. Agricultural, horticultural, forestry, poultry-keeping or bee-keeping machinery n.e.s. and parts thereof

v. Track-laying and wheeled tractors.

The main data source for this study is the UNIDO Industrial Statistics Database at the 2-digit level of ISIC revision 3 (INDSTAT2, 2011), which includes long time series by country and by principle indicators. A subset of countries was created with the statistics on principle indicators including employment, value added and output. Data were also drawn from the United Nations Commodity Trade Database and the UNIDO Industrial Demand Supply Database (IDSB). These sources provide detailed and disaggregated data for exports and imports. UNIDO's IDSB database combines the international trade data acquired from UN Comtrade with production data from the INDSTAT databases. The IDSB database contains data from Comtrade by SITC Rev. 3 and is converted into the corresponding ISIC Rev 3. Export and import data are aggregated with production data into two major country groups according to UNIDO's

classification of developing and industrialized countries. A snapshot of the data conversion process is depicted in Table 2.

The analysis of the selected countries' agro-industrial performance is based on descriptive statistical methods such as ratios, shares and averages. The paper analyses a number of economic indicators such as value added; output; employment in the sector in some countries; value of agro-industrial exports and value of agricultural machinery imports. Data availability for African countries was often poor. Data availability was generally much better for industrialized than for developing countries. For countries with limited data availability, value added figures were more accurately reported than employment figures. An imputation of missing values based on interpolation or estimation through highly correlated variables was carried out to the extent possible.

Table 1 Correspondence of ISIC Rev. 3 to SITC Rev. 3: An example

	ISIC Rev.3 code	*SITC Rev.3 code*	*Weight for Exports (%)*	*Weights for Imports (%)*	*Sign (+/-)*	*Description of SITC*
1	1511	011	100	100	+	Meat of bovine animals, fresh, chilled or frozen
2	1511	012.1	100	100	+	Meat of sheep or goats, fresh, chilled or frozen
3	1511	012.2	100	100	+	Meat of swine, fresh, chilled or frozen
4	1511	012.3	100	100	+	Meat and edible offal of the poultry of subgroup 001.4, fresh, chilled or frozen
5	1511	012.36	100	100	-	Poultry livers, frozen
6	1511	012.4	100	100	+	Meat of horses, asses, mules or hinnies, fresh, chilled or frozen
7	1511	012.5	100	100	+	Edible offal of bovine animals, swine, sheep, goats, horses, asses, mules or hinnies, fresh, chilled or frozen
8	1511	012.91	100	100	+	Meat and edible meat offal of rabbits or hares
9	1511	012.99	100	100	+	Other meat and edible meat offal, fresh, chilled or frozen
10	1511	016	100	100	+	Meat and edible meat offal, salted, in brine, dried or smoked; edible flours and meals of meat or meat offal
11	1511	017	100	100	+	Meat and edible meat offal, prepared or preserved, n.e.s.
12	1511	081.41	100	100	+	Flours, meals and pellets, of meat or meat offal (including tankage), unfit for human consumption; greaves
13	1511	211	100	100	+	Hides and skins (except furskins), raw
14	1511	211.9	100	100	-	Hides and skins, n.e.s.; waste and used leather
15	1511	268.19	100	100	+	....other
16	1511	411.2	100	100	+	Lard; other pig fat and poultry fat, rendered, whether or not pressed or solvent-extracted
17	1511	411.31	100	100	+	Pig fat free of lean meat and poultry fat (not rendered), fresh, chilled, frozen, salted, in brine, dried or smoked
18	1511	411.32	100	100	+	Fats of bovine animals, sheep or goats, raw or rendered, whether or not pressed or solvent-extracted

Source: UNIDO Statistics, IDSB

2 Patterns of growth and structure of agro-industrial sector

Agro-industrial sectors in today's world carry a different meaning than they did in the traditional perception where a gradual shift took place from agriculture to industry in the course of economic development. Modern technology, available resources for agricultural production and access to the global market have increasingly facilitated the vertical integration of agriculture with industry. In industrialized countries, where agro-industrial sectors emerged as a result of the industrialization of agriculture, the distinction between these two sectors is disappearing. In industrialized countries, the impact of R&D and innovations in production machinery is also visible in agricultural activities, while consumer demand has changed with regard to health and nutrition. However, the scenario is quite different in developing countries, especially in Africa where the agro-industrial sector is still in the early stages of mechanization in which intermediate inputs are transformed into manufactured products.

2.1 Agro-industrial production

The share of agro-industrial sectors in total manufacturing for any major variables, such as employment, production, exports and imports, indicate the extent of the agro-industrial sector's dependence on or departure from traditional sectors. Due to the fact that the majority of agro-industrial sectors are resource-based, they are generally characterized by low levels of technological innovation. As industrialization advances towards diversified and technology intensive activities, the share of the agro-industrial sector in an economy decreases. This is also evident in the significant change of distribution of value added in the manufacturing sectors of many countries. Recent decades have seen industries shift from low technology, labour and natural resource intensive industries to high and medium technology industries. Consequently, the share of resource based sectors in total production has gradually declined. However, agriculture holds a dominant position in the economy of many African countries. In some countries the share of agriculture in GDP (see Table 2) has actually increased over the last decade.

Table 2 Percentage share of agriculture in GDP of selected African countries

Country	2001	2009	Country	2001	2009
Benin	34.5	32.7	Mali	35.0	36.4
Burkina Faso	36.3	31.8	Niger	41.0	41.2
Chad	39.6	55.0	Nigeria	32.5	35.5
Comoros	40.9	43.1	Sierra Leone	40.1	56.7
Equatorial Guinea	88.2	67.5	Togo	37.7	42.7
Ghana	35.2	34.3	Zambia	19.6	20.9

Source: UNECA (2010)

Due to the agrarian nature of many African countries' economy, the share of agro-industrial sectors in total manufacturing is relatively high. Table 3 presents the share of agro-industrial sectors in total manufacturing value added in industrialized and developing countries and the relative importance of different sectors within agro-industry.

Table 3 Share of agro-industrial sectors in total manufacturing value added in selected country groups (2007) [1]

Countries	Food, beverages and tobacco	Textiles	Wearing apparel	Leather products	Wood products	Total
Industrialized						
South Africa	18.5	1.2	1.6	0.7	2.8	24.9
Italy	8.9	3.8	3.3	2.9	2.4	21.3
France	14.0	1.4	1.4	0.6	1.8	19.1
United Kingdom	14.6	1.4	0.7	0.2	2.0	19.0
Russian Federation	14.2	0.7	1.0	0.3	2.5	18.7
Belgium	12.5	3.0	0.7	0.2	2.1	18.5
United States	13.5	1.3	0.4	0.1	1.7	17.0
Japan	10.8	1.3	0.4	0.2	1.0	13.8
Germany	7.3	0.9	0.5	0.2	1.4	10.3
Developing						
UR Tanzania	62.0	7.4	0.1	0.2	0.0	69.7
Ghana	32.5	3.8	2.5	0.1	15.7	54.6
Ethiopia	41.2	4.4	1.3	3.5	0.6	51.0
Morocco	30.3	3.6	8.6	1.3	1.1	44.9
Kenya	30.3	1.7	1.4	0.9	0.7	35.0
Jordan	22.6	1.3	8.1	0.4	0.8	33.2
Mexico	25.3	1.7	0.8	0.6	0.2	28.6
China	11.8	5.2	3.3	1.5	1.2	22.9
Chile	14.4	0.5	0.7	0.4	2.7	18.6
India	8.8	5.5	1.6	0.6	0.2	16.7

Source: UNIDO INDSTAT2 Database

Agro-industrial sectors generally account for a substantial part of industrial output in developing countries compared to industrialized ones. This is particularly true in the case of Africa, where the share of the agro-industrial sector can be as high as 80 percent. As depicted in Table 2, developing countries in Asia and Latin America are less dependent on agro-industrial sectors than in Africa. The share of agro-industrial sectors in leading developing economies such as China and Mexico is less than 30 percent, while it has even fallen below 20 percent in India due to the increasing share of machinery, equipment and other manufacturing sectors.

Among the agro-industrial sectors, food and beverages as a sector producing essential consumer goods has a strong presence in both industrialized and developing countries; however, its size relative to total manufacturing varies significantly. In industrialized countries food

[1] The table excludes paper and rubber products which are also considered an agro-industrial sector.

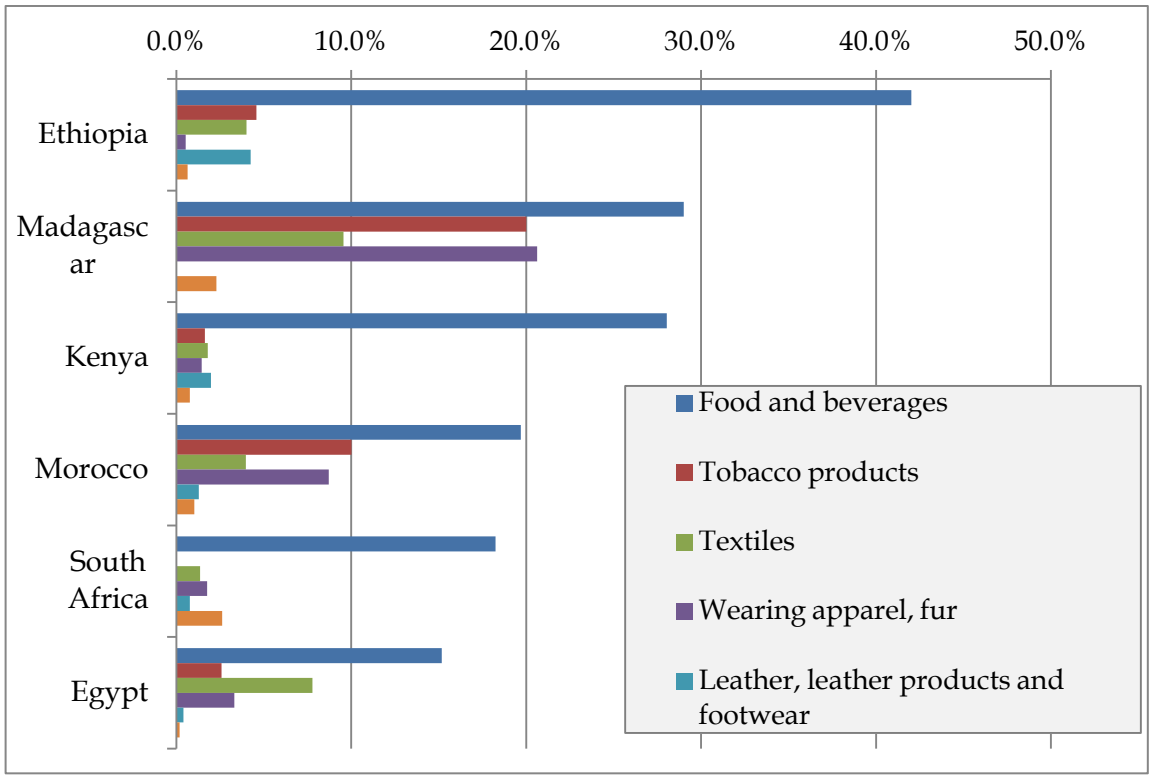
manufacturing contributes well below 20 percent of the total value added of the manufacturing industry, however, its share is more than half in some African developing countries. In Tanzania, food manufacturing represents more than 60 percent of the total value added of manufacturing. Similarly, the share of food manufacturing is quite high in Ghana, Ethiopia, Morocco and Kenya. Food manufacturing has a much smaller share in the developing countries of Asia and Latin America.

2.2 Structure of agro-industrial sectors in Africa

Despite the significant difference in structure of the agro-industrial sectors by country, one apparent feature common to all African countries is the dominance of food manufacturing in agro-industry. The agro-industrial sectors in the African region are further analysed using six countries as an example, namely Egypt, Ethiopia, Madagascar, Morocco, Kenya and South Africa. The share of food and beverages ranges from 15 to 40 percent of total value added. The share of food manufacture is more than 40 percent in Ethiopia. In Kenya, the dominant role of the food and beverages industry is evident, while the other industries have a share of less than 5 percent. The agro-industrial sector in Ethiopia is characterized by the strong presence of the food and beverages industry which accounts for more than 40 percent of the value added of total manufacture. The shares of the other agro-industries comprise less than 10 percent of the value added of total manufacture.

Countries with a higher level of industrial diversification are less dependent on food manufacturing which accounts for less than 20per cent in relatively industrialized African economies such as Morocco, South Africa and Egypt, which substantiates earlier arguments that the share of food manufacturing and other low technology sectors falls as industry becomes more diversified to include other modern high-tech sectors.

Figure 1 Structure of the agro-industrial sector in total manufacturing value added, 2006



Source: UNIDO INDSTAT2, 2011, at current prices (in US$)

To take a look at productivity in African countries' agro-industrial sectors, Table 4 presents the average value added per employee for selected African countries. The table compares the average value added per employee in agro-industrial sectors with the rest of the manufacturing sectors and the value for overall manufacturing.

Table 4 Average value added per employee by sector in US$, 2007

Country	Agro-industrial sectors	Other sectors of manufacturing	Overall manufacturing
Ethiopia	4794	5554	5514
Kenya	1395	4266	4264
Madagascar	103	696	646
Morocco	9407	19476	19146
South Africa	14849	24118	22395
Egypt	2739	6190	6065

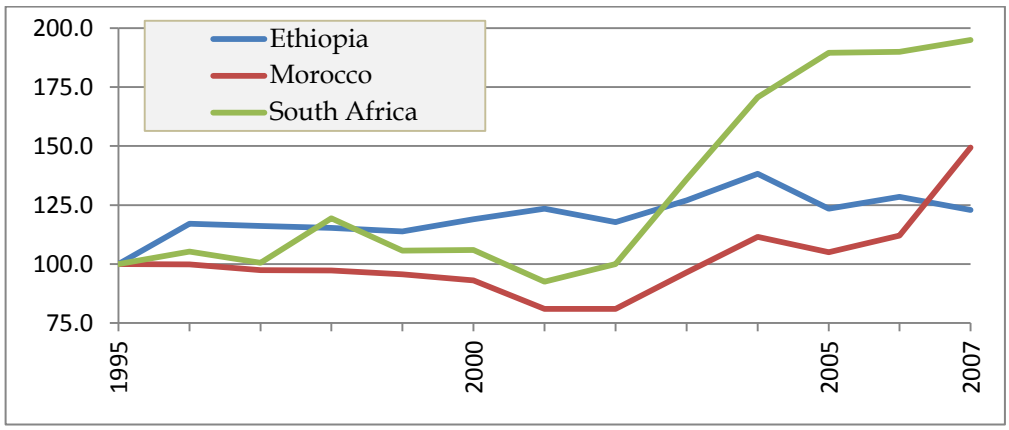
Source: UNIDO, INDSTAT2 Database, current prices (in US$)

Generally, value added per employee is considered a concrete measure of the relation of output to labour input, indicating the average amount of value added produced by an employee. However, it should be noted that a high level of value added per employee reflects a high level of capital and technology utilization within an industry. The figures presented in Table 3 vary widely between the six selected countries. South Africa has the highest level of productivity in all sectors. Similar to earlier observations in Table 2, economies with a relatively high degree of diversification such as Egypt, Morocco and South Africa has gained higher level of labour productivity in all sectors.

Another important observation one could draw is the low level of labour productivity in agro-industrial sectors compared to other sectors. The value added per employee in agro-industrial sectors in Kenya is three times lower than in other sectors, for example, and seven times lower in Madagascar. The relatively advanced north and south of Africa have achieved higher levels of labour productivity across the sectors, which significantly reduced their relative difference to other manufacturing sectors.

The difference in labour productivity and growth across African countries is evident. Although there was insufficient data to carry out longer time series analyses of labour productivity, the growth pattern was clearly more robust in Morocco and South Africa than in Ethiopia and other sub-Saharan economies, which could not be adequately depicted due to lack of data. Despite some decline in 2001-02, the value added per employee in South Africa doubled in 2007 compared to the 1995 level. Morocco's value added per employee grew by a factor of 1.5 during the same period compared to 1.2 in Ethiopia. Figure 2 presents the index of labour productivity in three selected countries.

Figure 2 Value added of the agro-industrial sector per employee (1995=100)



Source: UNIDO Statistics, INDSTAT2, 2011 (in US$)

The number of employees has significantly decreased in South Africa in recent years, especially in the textile and garment industry, however, the value of production has increased resulting in higher labour productivity. A similar tendency has also been observed in Morocco. However, the growth of labour productivity in Ethiopia's agro-industrial sectors was not significant.

Some conclusions can be drawn from the statistics presented above. First, agro-industrial sectors play a dominant role in the industrialization of Africa; however, the manufacturing activities of large parts of the continent are limited to the processing of some primary products. The countries of northern and southern Africa have already made some important achievements in diversification and productivity. However, for other sub-Saharan African countries, dependence on limited agro-industrial sectors remains a major challenge for achieving a more efficient and productive manufacturing industry. One of the key elements of change could be the mechanization of agriculture through the introduction of new technology. African countries have to rely on other countries for agricultural machinery. The following chapter provides some insights on these issues.

3 International trade of agro-industrial products

African countries have a tremendous potential for expand the merchandise export of agro-industrial products, for which there is growing demand in the international market. Exporting agro-industrial products carries two major benefits: first, such exports can be instrumental in the acquisition of modern technology in return for the mechanization of agriculture; second, sustained growth of agro-industrial exports can help African countries reduce poverty. However, the manufacturing industry in African countries has primarily targeted the domestic market and the regional market to some extent only. Africa's export in global trade remains rather limited. According to UNIDO's most recent estimates, Africa accounts for less than 1 percent of global exports. One of the reasons frequently cited is that many African countries cannot meet the market's demands and requirements, neither in terms of quantity due to the lack of technology and know-how nor in terms of quality due to supply-side constraints and non-tariff barriers for trade. Agricultural goods and other primary products are Africa's main export products, however, food insecurity and falling prices of agro-industrial goods have hampered the sustained growth of agricultural goods and other primary product exports. This chapter presents exports statistics of agro-industrial products as well as import statistics of agricultural machinery in African countries.

3.1 Export of agro-industrial products

As mentioned earlier, agro-industrial sectors account for a significant share of the manufacturing output of African countries. Subsequently, these sectors also play a dominant role in manufactured exports. The analysis of their export performance is based on data for 41 African countries, excluding those listed in Annex 1 and South Africa. Of these, Morocco, Tunisia, Côte d'Ivoire, Mauritius, Madagascar, Nigeria, Kenya, Namibia, Burkina Faso and Egypt are major exporters of agro-industrial products[2]. These countries accounted for 77.9 percent of total exports of agro-industrial products from the region in 2008. Morocco and Tunisia, which have benefited from proximity to the European market, have quite a large share of 46 percent of total exports from the region. By contrast, the remaining 12 countries have a total share of about 32 percent of agro-industrial exports, with each country's share being less than 10 percent.

While the relatively advanced countries of northern and southern Africa mostly dominate Africa's exports, their position has changed in recent years. The share of exports from Egypt, Mauritius, Morocco and Zimbabwe has decreased, while that of a number of sub-Saharan African countries such as Côte d'Ivoire, Kenya, Nigeria and Burkina Faso has increased. Figure 3 ranks the countries by their share of agro-industrial exports, with Morocco and Tunisia representing the largest share.

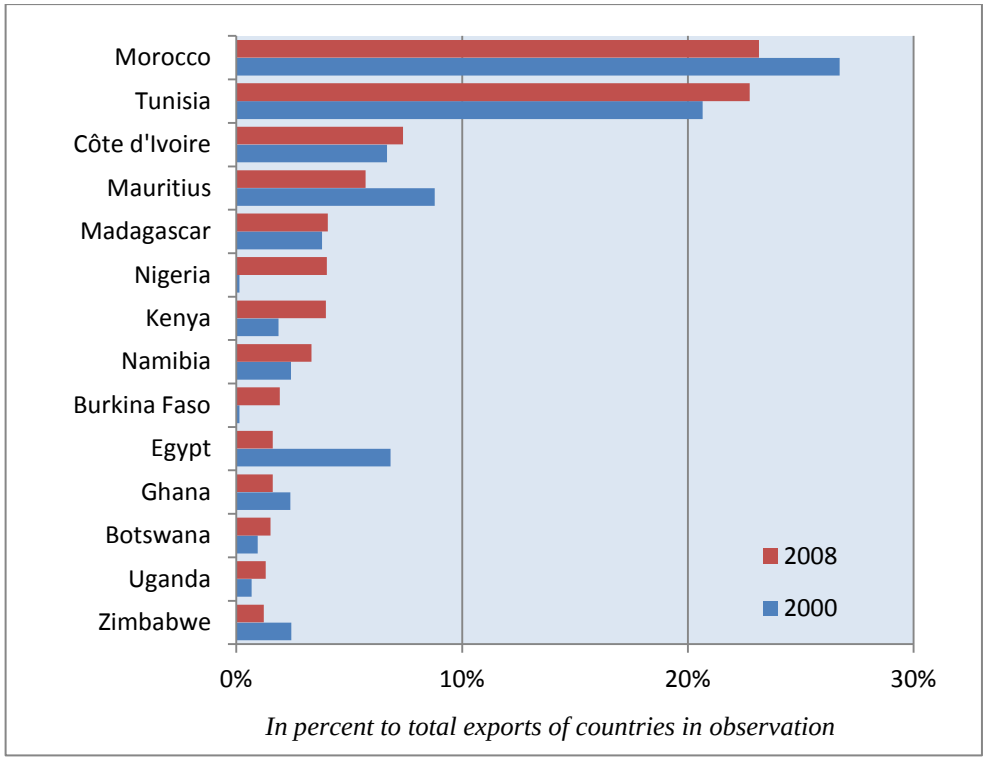
Many industrialized countries have witnessed the decline of agro-industrial sectors in their domestic production. However, consumption of high quality agro-industrial goods is rising. This creates an opportunity for developing countries to boost their production and stimulate export growth to meet the increasing demand for agro-industrial commodities in industrialized countries. North African countries have seized this opportunity in a similar way as their Asian partners. However, large parts of Africa have not been able to benefit from these trends. So far, the export of agro-industrial products from sub-Saharan Africa has been concentrated in a few low price commodities rather than in high value added products.

In sub-Saharan Africa, agro-industrial sectors account for a substantial share of manufactured exports. Countries which have an industry for processing mineral resources may be an exception. Owing to the production and export of petroleum products, the share of agro-industrial products in manufactured exports is smaller in countries like Ghana, Nigeria and Sudan. Although some countries have managed to increase the share of other industrial products

[2] South Africa is excluded from this analysis.

in their total exports, such as Namibia and Uganda, agro-industrial products account for most of the manufactured exports in other sub-Saharan countries. For example, the share of agro-industrial products exceeds 80 percent in Madagascar, 75 percent in Malawi and 60 percent in Gambia.

Figure 3 Share of top exporters of agro-industrial products in Africa in 2008



Source: UN Comtrade

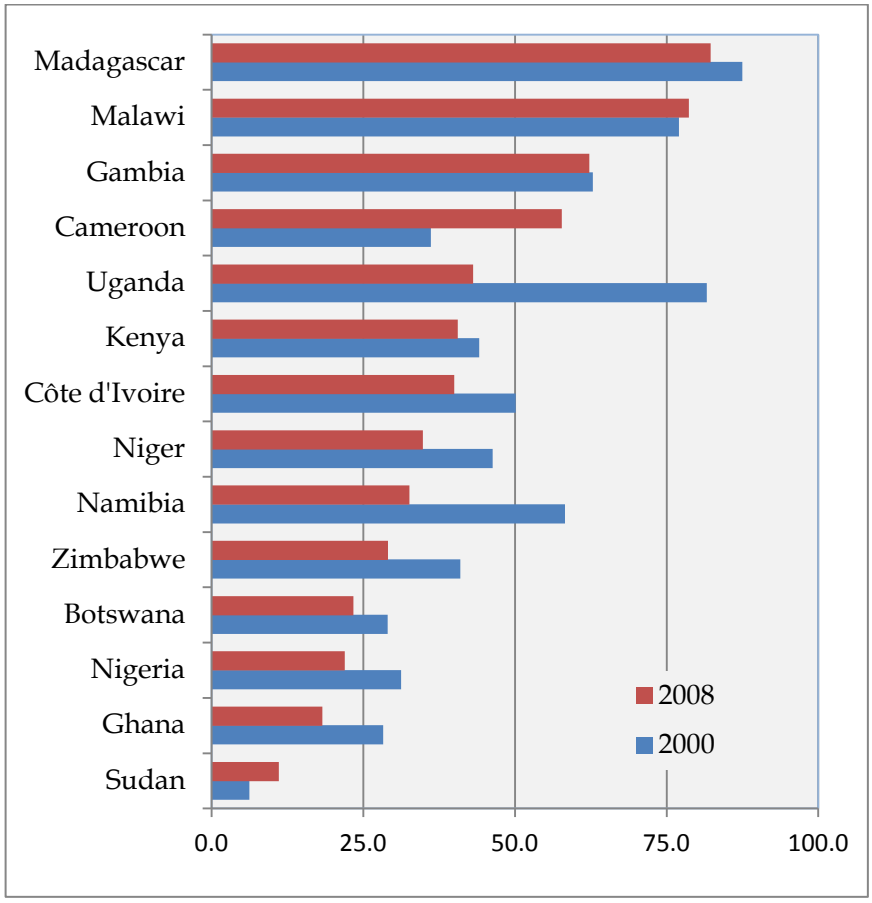
In relative terms, agro-industrial exports will drop with the further diversification of the economy as other sectors increase their share in the country's total exports. Consequently, a diminishing trend of the share of agro-industrial exports is inevitable in Africa. This is also evident in However, the absolute value of agro-industrial products can grow considering that Africa has the potential to enhance the export of agro-industrial commodities in order to meet the global market's growing demand. However, countries must enhance not only their production capacity but also their trade capacity. Recent trends suggest that Africa's share in the market of industrialized countries is decreasing.

Figure 4, which indicates a decreasing share of agro-industrial products in the manufactured exports of the majority of African countries since 2000.

However, the absolute value of agro-industrial products can grow considering that Africa has the potential to enhance the export of agro-industrial commodities in order to meet the global

market's growing demand. However, countries must enhance not only their production capacity but also their trade capacity. Recent trends suggest that Africa's share in the market of industrialized countries is decreasing.

Figure 4Share of agro-industrial exports in total manufacturing: 2000-2008



Data source: UN Comtrade, author's calculations (US$)

3.2 Export destinations

Traditionally, Europe, together with Japan and the United States, has been the major export destination of African agro-industrial products. However, their share in Africa's total exports has decreased in recent years. Africa's total exports are dominated by primary products and mineral resources, which are increasingly being exported to the rapidly industrializing economies of Asia and Latin America. As the processing industries shift their production sites from North America and Europe to Asia, the export destinations and trading partners for primary products have changed. Agro-industrial products have not belonged to the major commodities African countries export to Asia, because Asian countries themselves are competing for a higher share of exports to industrialized countries' markets. Industrialized countries are major importers of African agro-industrial products. Table 5 shows that the ten

leading importers accounted for 80 percent of total exports of African agro-industrial products. Among the ten leading importers are seven countries from European Union. However, their share as well as that of other countries is decreasing in total. The share of agro-industrial exports from Africa to France and the United Kingdom, which have maintained strong trade relations with Africa since colonial time, has decreased.

Table 5 Leading importers of African agro-industrial products in 2000 and 2008

	Importing country	2000	2008
1	France	22.5	18.5
2	Italy	11.7	13.1
3	United Kingdom	10.1	6.8
4	United States	8.6	5.5
5	Spain	7.7	11.2
6	Germany	6.7	4.6
7	South Africa	4.5	2.8
8	Netherlands	3.2	3.4
9	Belgium	3.1	2.3
10	Japan	2.5	1.0
	Sum of above	80.6	69.3

Data source: UN Comtrade, author's calculations

African countries are facing a dilemma: on the one hand, they need to maintain their market share in industrialized countries to benefit from the growing demand for agro-industrial products; on the other, they must also diversify the market to reduce dependence on limited export destinations. An expansion of exports within the region does not seem feasible due to high intra-African tariffs as well as non-tariff barriers, weak transport links and other obstacles of cross-border trade. In any case, it is more beneficial in terms of economic growth for African countries to export agro-industrial goods rather than primary commodities. There is statistical evidence that the export surge of primary commodities to Asia has had adverse effects on industrialization and there is a clear indication of deindustrialization in a number of sub-Saharan African countries.

The export of high-value manufactured products instead of primary goods would also contribute to the countries' capacity to import technology. They could mobilize revenue from the export of agro-industrial products for investment in agricultural machinery. The next chapter presents some statistics on the import of agricultural machinery by African countries.

4 Import of agricultural machinery to Africa

As the domestic production of agricultural machinery is extremely limited in most African countries, their import is considered an indicator of a country's readiness to invest in the mechanization of agricultural production. Agricultural mechanization introduces technology and increased power in agriculture to enhance labour productivity and to achieve results that may often be well beyond the capacity of human labour. This includes the use of tractors as well as animal and human-powered implements and tools. Mechanization also includes irrigation systems, food processing and related technologies and equipment. The data analysis in this paper includes cultivating machinery, harvesting machines, dairy machinery and parts, agricultural, horticultural, forestry, poultry-keeping or bee-keeping machinery and track-laying and wheeled tractors.

Agricultural activities in Africa are largely dominated by subsistence farming which yields just enough produce to feed the families and workers involved. A shift to more productive commercial farming would require mechanization. The number of tractors per hundred square kilometres of arable land, which is a widely recognized indicator of agricultural mechanization, is only 13 for Africa compared to 129 for South Asia, which is the least developed region in Asia. The world average is 200. Sub-Saharan Africa also lags behind other developing regions of Asia and Latin America with regard to other indicators. Some progress has, however, been made in recent years. There is a clear understanding that the continent's potential for commercial farming must be tapped to raise the level of living of millions of rural population. There is also some evidence that Africa is investing a significant amount for imported agriculture machinery.

4.1 Patterns of import of agricultural machinery

Despite the year-to-year variation, the import of agricultural machinery to Africa has grown consistently in recent years and reached US$ 3.7 billion in 2008. Recent estimates show that the total import of agricultural machinery has increased by more than 2.5 times compared to 2000. When looking at individual countries, the situation varies. As Table 6 shows, all of the countries selected for analysis reveal significantly increased imports of agricultural machinery with the exception of Gabon, Gambia and Swaziland. Table 6 further indicates that agro-industrial imports to countries such as Kenya, Morocco, Sudan and Egypt significantly increased in 2006. This is more clearly depicted in Figure 5.

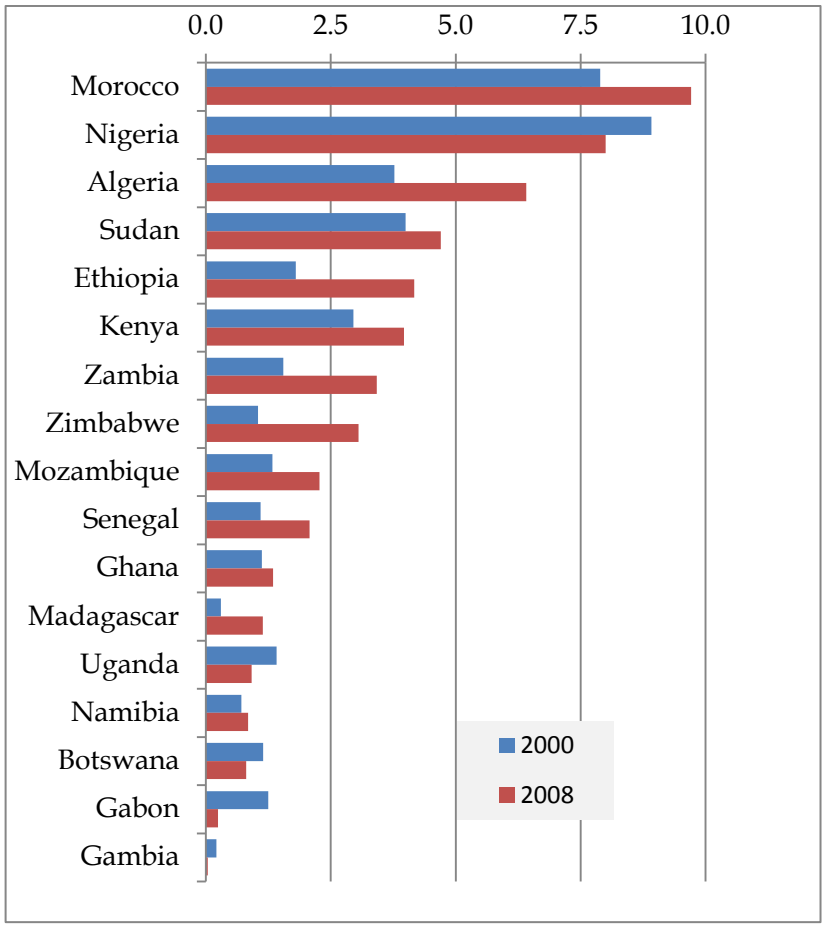
Table 6 Total imports of agro-industrial machinery by selected African countries (in million US$)

	2000	2001	2003	2004	2005	2006	2007	2008
Botswana	14.79	23.83	22.41	26.82	18.29	16.90	26.60	45.50
Ethiopia	23.17	15.18	25.36	32.27	94.69	92.05	102.98	162.63
Gabon	16.13	4.71	5.02	7.67	5.51	12.52	---	---
Gambia	2.75	1.10	1.14	0.95	0.83	1.40	6.86	1.46
Ghana	14.45	23.60	25.46	35.81	30.64	46.97	76.44	58.21
Kenya	38.03	46.60	47.12	89.42	90.15	94.04	138.36	143.52
Madagascar	3.85	1.80	6.45	16.42	25.95	11.58	15.76	38.52
Mali	6.62	6.27	7.38	21.95	10.28	11.60	12.30	7.94
Mauritania	0.48	1.84	1.48	0.72	4.08	9.71	4.63	16.01
Morocco	101.61	168.24	222.39	240.15	220.69	427.02	504.12	838.24
Mozambique	17.15	17.80	16.17	29.39	51.70	39.68	43.91	90.66
Namibia	9.16	9.95	8.24	16.30	19.20	27.40	28.35	51.36
Nigeria	114.81	216.05	153.47	---	---	1242.98	867.02	328.54
Senegal	14.15	4.32	8.40	18.21	47.15	30.16	33.14	30.20
Sudan	51.52	34.75	83.54	132.98	924.98	1256.20	183.36	139.08
Swaziland	35.66	39.24	34.10	41.88	34.59	30.28	41.50	---
Uganda	18.27	17.60	14.18	24.44	20.79	26.56	41.50	34.73
Egypt	99.41	65.80	41.81	69.01	99.06	119.93	198.88	420.48
Zambia	19.95	34.24	81.73	81.56	77.77	56.64	76.60	96.15

Data source: UN Comtrade, author's calculations

As a large number of African countries are still highly dependent on agriculture, those countries with relatively larger agricultural sectors focus more on agriculture and subsequently import more agricultural machinery than others. Figure 7 depicts the most significant importing countries of agricultural machinery in the African region, which is measured as the share of agricultural machinery imports of each country to the total agricultural machinery imports of the entire region. As shown in Figure 7, Morocco, Nigeria, Zimbabwe, Tunisia, Ethiopia, Algeria, Kenya, Sudan and Malawi were the major importers of agricultural machinery in 2008, accounting for 75.22 percent of the region's total agricultural machinery imports. Morocco and Malawi are the major importers of agricultural machinery, accounting for more than 10 percent of total agricultural machinery imports. With Ethiopia in the lead with its relatively large economy, these countries have an agricultural value added of between 30 to 48 percent of their GDP (WDI, 2011). The countries with the lowest level of agricultural machinery imports are Uganda, Senegal and Mauritania, all of which accounted for less than 1 percent of total regional imports of agricultural machinery. In 2000, the most important importing countries in the region were Tunisia, Nigeria, Morocco and Sudan, accounting for 11.59 percent, 8.91 percent, 7.89 percent and 4 percent, respectively, of total agricultural machinery imports.

Figure 5 Most important importing countries of agricultural machinery in the African region



Data source: UN Comtrade, author's calculations

Agricultural mechanization is a means to improve the productivity of agriculture. It includes the use of different tractor types such as wheeled tractors, cultivation machinery and harvesting machinery. The structure of agricultural machinery imports varies between countries due to each country's distinct agricultural situation. Table 7 depicts the structure of agricultural machinery imports of selected African countries. In 2008, wheeled tractors represented the largest group of total agricultural machinery imports in each of the selected African countries except for Mali. For some countries such as Mozambique, Sudan, Kenya, Morocco, Mauritania and Botswana, the percentage of imports of wheeled tractors is higher than 50 percent of their total agricultural machinery imports. The case of Mali should not be neglected, as it is the only of these selected countries in which cultivation machinery has the highest percentage followed by the wheeled tractors category. Harvesting machinery is the second most imported machinery group at over 20 percent in most countries, except for Namibia, Mozambique and Gambia, where cultivation machinery represents the second largest import commodity accounting for 26.97 percent, 16.12 percent and 30.59 percent, respectively, of total agricultural machinery

imports. The least imported agricultural machinery category for all selected countries is track-laying tractors with the imports not exceeding 7 percent in all countries except Ethiopia, where track-laying tractors represent the second largest import commodity at 20.40 percent.

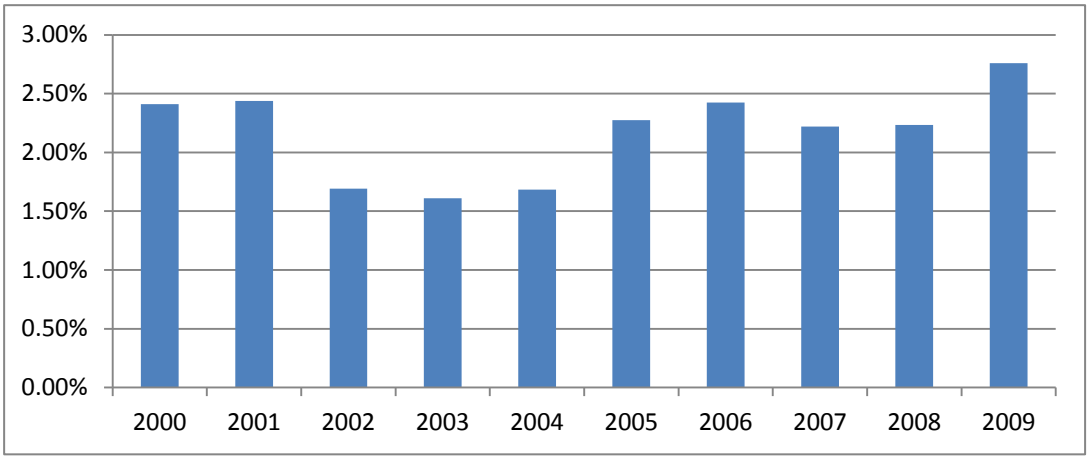
Table 7 Structure of agro-industrial machinery imports for selected countries in 2008 (%)

	Cultivation machinery	Harvesting machinery, etc.	Dairy machinery, parts, etc.	Agric. hort. etc. machn.nes	Track-laying tractors	Wheeled tractors nes
Mozambique	16.12	7.51	0.35	8.80	1.91	65.31
Sudan	5.65	18.17	2.97	8.89	0.00	64.33
Kenya	15.23	10.03	3.84	7.47	1.06	62.37
Morocco	6.64	17.95	8.01	7.80	0.00	59.59
Mauritania	0.62	23.16	1.03	0.32	20.13	54.74
Botswana	12.25	11.64	4.98	14.96	2.14	54.04
Madagascar	3.80	2.80	31.26	2.39	10.04	49.72
Uganda	9.47	19.97	14.18	7.58	0.00	48.80
Egypt	3.02	21.90	9.05	18.45	0.01	47.57
Zambia	15.64	19.01	4.54	13.16	2.76	44.89
Namibia	26.97	15.84	4.13	9.67	0.70	42.69
Gambia	30.59	18.81	2.86	7.27	0.00	40.48
Senegal	14.68	18.77	2.74	18.61	4.74	40.46
Ghana	8.20	7.64	0.19	10.21	1.29	39.68
Nigeria	10.14	18.17	11.43	14.65	6.16	39.45
Ethiopia	14.36	24.05	1.36	10.08	20.40	29.74
Mali	34.04	17.36	13.41	10.99	0.00	24.20

Source: UN Comtrade, author's calculations

Even though the amount of agricultural machinery imported by African countries is relatively large compared to the size of their economy, it is expected that this does not account for a significant share of total global imports of agricultural machinery import. Figure 6 illustrates the share of African imports of agricultural machinery to that of the world, which is measured as the proportion of total imports of agricultural machinery in the African region to total world imports of agricultural machinery. According to the graph, Africa's share of agricultural machinery imports to that of the world remained as low as or less than 3 percent. Despite the sharp decrease during 2002–2004, the share has been rising since 2005, reaching a maximum of around 3 percent in 2009, which is about US$ 3266 million. This low share also indicates a reduced need for farm machinery manufactures, which have traditionally been supplied to Africa, which is attributable to two main reasons: first, the machinery is becoming increasingly more sophisticated, larger and more expensive, and secondly, the African market is perceived as declining compared to two decades ago, hence, it is not considered worthy of investing marking resources (FAO/UNIDO 2008).

Figure 6 Contribution of the African region to world imports of agricultural machinery



Data source: UN Comtrade, author's calculations

To determine which countries export agricultural machinery to African countries, Table 8 presents a list of imports to African countries from 2000 to 2008. The majority of industrialized countries are agricultural machinery exporters, as are South Africa, Egypt, Nigeria and, most recently, China. As the table below indicates, Botswana, Mozambique and Namibia's major importing partner was South Africa in 2000 and 2008, accounting for between 40 percent and 90 percent of their total imports. In 2000, Gabon, Mali, Mauritania and Senegal had less diversified imports which were primarily concentrated in a single partner such as USA (34.16 percent), United Kingdom (47.98 percent), Germany (65.69 percent) and France (40.63 percent); by 2008, they diversified their imports to include more trading partners, including Germany, France, Italy and Egypt, which accounted for 16.85 percent, 31.81 percent, 38.67 percent and 14.58 percent, respectively, of their total imports. Moreover, for Ethiopia, Gabon, Morocco, Nigeria, Uganda, Egypt and Zambia, whose imports were more diversified, United Kingdom, Germany, USA, Italy, Spain and France were the top import partners in 2000. China, India and Egypt were the top import partners for Ethiopia, Gambia, Ghana and Uganda in 2008, replacing Italy and United Kingdom. It is interesting to note that United Kingdom was no longer a top import partner for those countries in 2008, but was in 2000.

The fact that South Africa and Egypt were the top import partners for some countries in 2008 signifies that industrial activities in South Africa, Egypt and Nigeria began focusing on agricultural machinery production. Such industrial activities constitute a potential to develop a dynamic capital goods sector for agriculture in the medium and long term. They also represent a potential for industrial expansion in Africa, provided that these industrial activities can be viably developed to serve the national, sub-regional and regional African market. In view of the long lead times for imported machinery equipment and spare parts Africa is currently experiencing,

including the high maintenance costs, the effective utilization and production of agro-processing machinery is being promoted (Yumkella et al., 2011).

Table 8 Import flows of agricultural machinery for the years 2000, 2008

Importer	2000		2008	
	Exporter	in % of the country's total imports	Exporter	in % of the country's total imports
Botswana	South Africa	91.64	South Africa	89.55
Ethiopia	Italy	23.66	China	19.94
Gabon	USA	34.16	Germany	16.85
Gambia	United Kingdom	28.63	India	30.20
Ghana	Italy	24.67	Italy	54.18
Mali	United Kingdom	47.98	France	31.81
Mauritania	Germany	65.69	Italy	38.67
Morocco	Spain	19.20	South Africa	42.21
Mozambique	South Africa	57.91	South Africa	85.56
Namibia	South Africa	68.38	China	18.28
Nigeria	Germany	25.85	France	19.17
Senegal	France	40.63	Egypt	14.58
Uganda	United Kingdom	22.47	India	17.84
Egypt	Italy	16.18	South Africa	13.01
Zambia	United Kingdom	20.23	South Africa	56.90

Source: UN Comtrade, author's calculations

However, as shown in Table 9, the 10 leading export partners of agricultural machinery to the African region in 2008 were Italy, Mozambique, China, South Africa, France, India, Brazil, Turkey, Germany and USA, all of which accounted for 73 percent of Africa's total agricultural machinery imports in 2008, while the remaining partners only represented 27 percent. Among the top ten export partners to Africa were three countries from Europe: Italy, France and Germany. China and India accounted for 13.31 percent of total imports of agricultural machinery.

Table 9 The leading exporters of agricultural machinery to the African region, 2008

Country	%
Italy	14.36
Mozambique	13.77
China	7.99
South Africa	7.96
France	6.10
India	5.32
Brazil	5.11
Turkey	4.70
Germany	4.16
United States of America	3.55
Total	73.00

Source: UN Comtrade, author's calculations

Table 10 presents the 10 leading export countries of agricultural machinery, which account for 73.92 percent of total global exports of agricultural. Among the 10 leading exporters of agricultural machinery is Germany in first place with 21.35 percent, followed by USA with 15.23 percent. Among these top 10 leading exporters of agricultural machinery are six European countries: Germany, Italy, France, United Kingdom, Belgium and Austria, which account for more than half of total global exports.

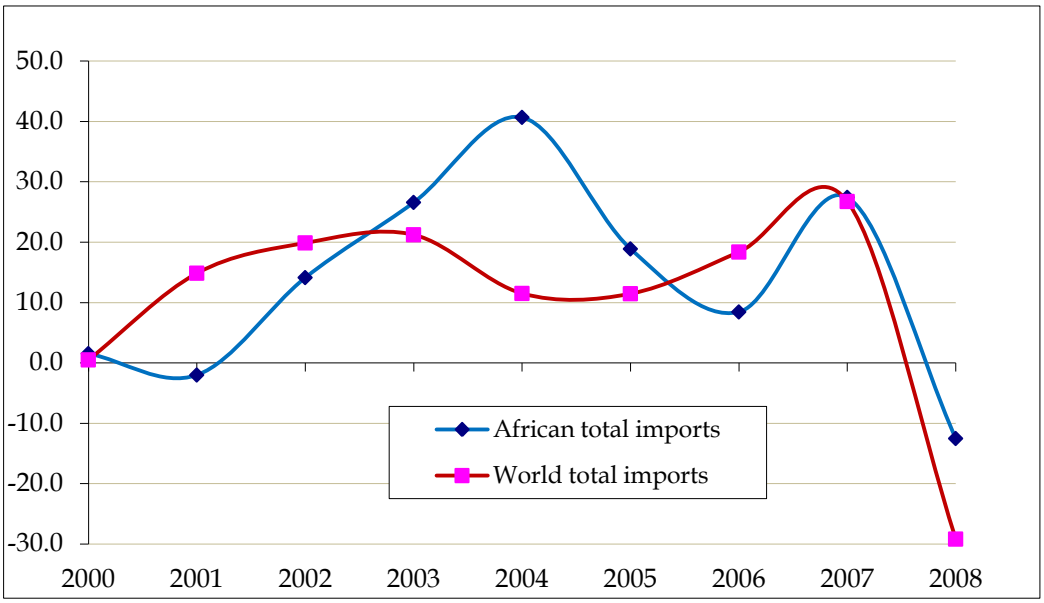
Table 10 Leading global exporters of agricultural machinery, 2008

Country	%
Germany	21.35
USA	15.23
Italy	9.85
France	6.40
Japan	5.00
United Kingdom	3.97
Netherlands	3.25
China	3.14
Belgium	2.92
Austria	2.79
Total	73.0

Source: UN Comtrade, author's calculations

Despite the fact that agricultural machinery imports account for a minor share of global agricultural machinery imports, it is worth comparing the growth rate of such imports between Africa and the world. This is because the African continent has been the second fastest growing region after East Asia over the last ten years. While agriculture is the main sector in most African countries, agricultural machinery imports have definitely had a positive effect on economic growth. Figure 7 illustrates the growth rate of total imports of agricultural machinery in the world and the African region. The growth for global imports of agricultural machinery was particularly high in 2007 (26.76 percent). The average growth rate during the period 2000 to 2008 was only 10.61 percent due to the sharp decrease in growth in 2008, with a negative growth rate of -29 percent. The African region had a higher average growth rate during the same period (12.72 percent), however, compared to the global growth rate, the import of agricultural machinery to the African region has fluctuated. The region had a negative growth rate (-20.22 percent) in 2001, and reached its highest value at 50.59 percent in 2004, and then dropped to the lowest level in 2008, with a negative growth rate of -12.52 percent. The figure shows that the African region's growth rate was higher than the world's.

Figure 7 Growth of agricultural machinery imports: Africa and the world



Data source: UN Comtrade, author's calculations

4.2 Export of products and import of machinery

As agricultural mechanization is essential for improving agricultural productivity, this will consequently increase the amount of agro-industrial products. In the era of deepening globalization, an increased amount of agro-industrial products will result in higher levels of agro-industrial product exports. Table 11 shows that imports of agricultural machinery by the selected six countries from the African region are increasing rapidly, in particular in South Africa, Kenya, Morocco and Ethiopia, where imports of agricultural machinery increased nearly 4 times between 2000 and 2007. In 2007, the indices for imports of agricultural machinery, using 2000 as a base year, increased by 4.09, 4.96 and 4.44 for Madagascar, Morocco and Ethiopia, respectively. This demonstrates the efforts by developing[3]African countries to invest in agricultural mechanization to enhance their agro-industrial production.

Table 11 Imports of agricultural machinery by selected African countries: 2000-2007(million US$)

	2000	2001	2002	2003	2004	2005	2006	2007
South Africa	387.41	307.97	614.85	721.84	1034.43	777.45	1095.04	1441.42
Kenya	38.03	50.87	46.60	47.12	89.42	90.15	94.04	138.36
Madagascar	3.85	3.48	1.80	6.45	16.42	25.96	11.58	15.76
Morocco	101.61	108.13	168.24	222.39	240.15	220.69	427.02	504.12
Egypt	99.41	81.83	65.80	41.81	69.01	99.06	119.93	198.88
Ethiopia	23.17	16.00	15.18	25.36	32.27	94.69	92.05	102.98

Source: UN Comtrade

[3] South Africa belongs to the group of industrialized countries, however, it is used in this group of countries due to the limited availability of data for other African countries.

The low level of engineering technology input in agriculture in Africa has been cited as one of the major constraints preventing the modernization of agriculture in Africa and an increase in the sector's productivity. Therefore, increasing imports of agricultural machinery have definitely had a positive impact on agricultural productivity in Africa, resulting in increased agro-industrial production in those countries as indicated in Table 12. Accordingly, the selected countries' output of agro-industrial production is increasing for all the selected countries[4]except for Madagascar. In 2006, the indices for output of agro-industrial products for South Africa, Kenya, Morocco and Ethiopia was 1.98, 1.64, 1.40 and 1.48, respectively, implying that these countries' value of output increased by nearly twice the 2001 value.

Table 12 Output of agro-industrial products for selected African countries: 2000-2007 (million US$)

	2001	2002	2003	2004	2005	2006
South Africa	22649.43	22341.15	33461.25	41286.04	44171.79	44910.25
Kenya	2265.03	2224.34	2574.90	2665.82	3212.52	3723.23
Madagascar	744.04	527.27	737.68	500.82	464.83	470.57
Morocco	7818.85	8439.62	9773.25	10344.85	10612.66	10997.46
Ethiopia	634.26	599.20	656.65	751.85	804.63	940.72

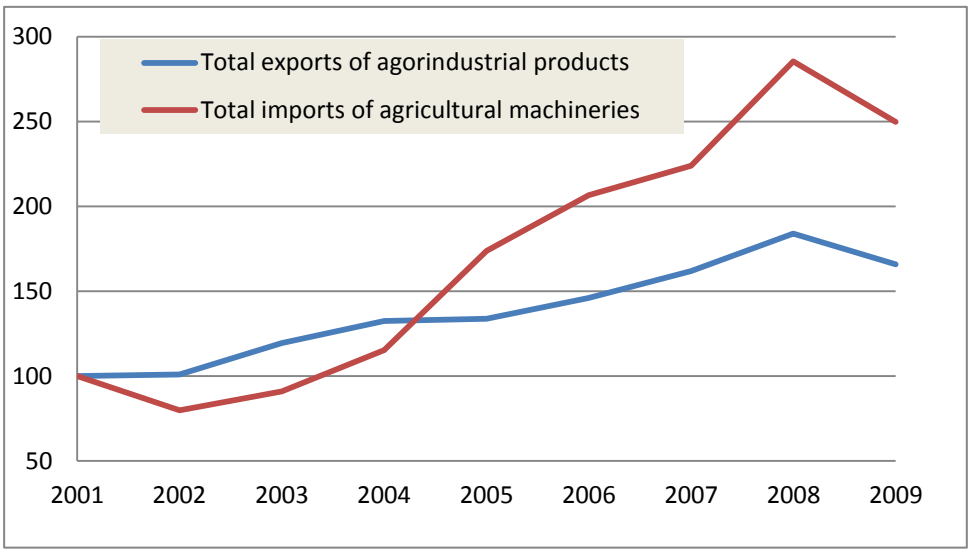
Source: UNIDO statistics, INDSTAT2, 2011

Since African countries have increased their agricultural machinery imports in the last ten years, their output of agro-industrial products has consequently increased as the earlier analysis shows, therefore, we would expect exports of agro-industrial products to increase as well, as agriculture contributes more than 80 percent of trade in value in African countries.

Figure 8 presents the index of total exports of agro-industrial products and total imports of agricultural machinery in the African region. Recent years have witnessed an increase in both imports and exports. The graph indicates a correlation of imports and exports, since they both increase and decrease in the same periods. However, it is evident that more agricultural machinery has been imported than agro-industrial products exported. Moreover, imports of agricultural machinery are increasing faster than exports of agro-industrial products. This might be attributable to the lag in production of imported machines which impacts agricultural output.

[4] Egypt is excluded due to limited data availability on output production.

Figure 8 Index of total exports of agro-industrial products and total imports of agricultural machinery in the African region



Source: UN Comtrade, author's calculations (index 2001=100)

The economy in African countries is strongly dominated by agriculture, which generally generates 50 percent of their GDP. Increased agricultural output results in the increase of exports of agro-industrial products. The reason for this is that agricultural products usually account for 80 percent of total exports in developing countries. As shown in Table 13, the export of agricultural products[5] of the selected countries increased in the period between 2000 and 2007. In 2007, the indices of agricultural product exports using 2000 as a base year increased 1.84 percent, 1.72 percent, 1.39 percent, 1.71 percent, 3.68 percent and 2.13 percent for South Africa, Kenya, Morocco, Egypt and Ethiopia, respectively. Africa is the only region in the world where agricultural productivity is largely stagnant. This situation has triggered profound demand to improve agricultural productivity. Our earlier analysis indicates that African countries' had undertaken efforts to attain agricultural mechanization by importing agricultural machinery to boost production. However, their production performance has not been as high as expected.

Table 13 Agricultural products exports: 2000 to 2007 for selected countries (million US$)

	2000	2001	2002	2003	2004	2005	2006	2007
South Africa	1735.96	1807.65	1896.21	2389.44	2674.13	3074.81	2882.31	3196.75
Kenya	879.56	845.50	388.90	987.09	983.23	1173.02	1313.92	1517.10
Madagascar	270.46	417.43	393.16	479.87	353.61	242.11	326.31	376.75
Morocco	1580.74	1479.33	1652.37	1841.89	1768.48	2199.10	2281.09	2707.54
Egypt	338.77	392.26	382.08	487.54	705.74	888.96	861.07	1245.64
Ethiopia	290.96	203.08	244.17	255.31	320.90	481.80	561.95	620.26

Source: UN Comtrade

[5] Products included in SITC : Section: 0 - Food and live animals

5 Summary

This analysis has outlined the development of African countries' agro-industrial sector. Exploring the different factors of the agro-industrial sectors in developing countries, especially in African countries, our analysis presents the structure, growth pattern and international trade of agro-industry. The situation of agricultural machinery imports in Africa is also addressed, as agro-industry productivity is very much related to the degree of industrialization of the country.

The findings suggest that developing countries have a larger share of agro-industrial manufacturing value added than industrialized countries, underlining the commonly held view that the significance of the agro-industrial sector decreases in industrialized countries. Moreover, at national level the share of agro-industry in total manufacturing value added decreased in the period 1995–2006 for selected countries in Asia, Latin America and Africa. Agro-industry covers eight manufacturing sectors, of which the food and beverages industry has a relatively strong presence in the agro-industrial sector.

With regard to international trade of agro-industrial products in African countries, agro-industrial exports in total exports at national level are significant for many countries of the region. This is attributable to the fact that agro-industrial products exports contribute more than 30 percent in total exports at national level. As far as the main target exports of agro-industrial products in African countries are concerned, Europe is the region's principal exporting market.

The low level of investment in agricultural machinery in African countries has been quoted as one of the main reasons for low agricultural productivity. Our analysis of agricultural machinery imports in African countries indicates an increasing trend in the last ten years. Although the average growth of African agricultural machinery imports is higher than 10 percent on average, the total still accounts for less than 3 percent of total agricultural machinery imports in the world. The region's agricultural machinery imports were more diversified in 2008 than in 2000, including the top ten trade partners from Asia, Europe, Africa, Latin and North America. Europe is the major exporter of agricultural machinery with a share of more than 50 percent of total global agricultural machinery exports. With regard to agricultural machinery imports in the African region, wheeled tractors are the most important agricultural machinery group being imported, dominating more than 50 percent of total agricultural machinery imports for most of the African countries at national level.

The analysis also shows that even though total agro-industrial exports are positively correlated with total imports of agricultural machinery in the African region, the leading importers of agricultural machinery at regional level are not the top exporters of agro-industrial products. Of

the top ten exporters of agro-industrial products, only Morocco, Nigeria, Tunisia and Kenya belong to the group of top ten countries in terms of agricultural machineries imports at regional level. Moreover, taking the indices trends from a sample of countries into consideration, which reveal a higher growth rate of agricultural machinery imports than of agro-industrial products output and of exports of agricultural products, we can conclude that in spite of the significant efforts undertaken by developing countries thus far to attain agricultural mechanization, they still have a long way to go until they reach a level at which this technology is being used as efficiently as possible. To some extent, all African countries have undergone agricultural modernization, which involves a very important component of industrialized inputs to introduce technical changes.

Annex: List of countries included in export import data analysis

1. Algeria
2. Benin
3. Botswana
4. Burkina Faso
5. Burundi
6. Cameroon
7. Cape Verde
8. Central African Republic
9. Comoros
10. Côte d'Ivoire
11. Egypt
12. Eritrea
13. Ethiopia
14. Gabon
15. Gambia
16. Ghana
17. Guinea
18. Kenya
19. Lesotho
20. Madagascar
21. Malawi
22. Mali
23. Mauritania
24. Mauritius
25. Morocco
26. Mozambique
27. Namibia
28. Niger
29. Nigeria
30. Sao Tome and Principe
31. Senegal
32. Seychelles
33. Sierra Leone
34. Sudan
35. Swaziland
36. Togo
37. Tunisia
38. Uganda
39. United Republic of Tanzania
40. Zambia
41. Zimbabwe

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