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East Africa and the Indian Ocean, the African pillar of cereal and plant protein production

In concise...

While cereals (maize, sorghum, rice, wheat, etc.) are the mainstay of production and diet in many countries in the region, the cultivation of beans and other pulses is an important source of plant protein. Cereals and protein crops production has increased significantly over the past 20 years and now accounts for 40% of total production in sub-Saharan Africa. The region is leader in wheat and barley production in Sub-Saharan Africa, but also in beans and sorghum, and to a lesser extent maize and rice. **However, dependence on imports is gradually increasing for several of these cereals (wheat, rice, and even maize), but more so for oil and oilseeds. The sanitary crisis, amplified by the war in Ukraine, now highlights the importance of these strategic products in ensuring the food and nutritional security** of these populations and urges governments and private actors to adopt a more integrated approach to food systems, favorable to the joint development of these agricultural products.

In detail...

Diversified and fast-growing cereal and legume production

The areas devoted to cereal, pulse and oilseed production represent a total of 57.3 Mha in EAOI (+ 67% in 20 years, i.e., + 2.6% per year). This represents the vast majority of the areas cultivated and harvested in EAOI (81.4 % on average in the region), except in some countries such as Uganda, Rwanda, Burundi where the production and consumption of tubers and bananas is historically more pronounced. The crop systems in the Horn of Africa and Madagascar are more oriented towards cereals, and in proportions similar to those observed in France and the EU—60 to 80% of the cultivated and harvested land is devoted to cereals. On the contrary, the cropping systems of the East African Community, although strongly dominated by maize farming, have proportions of cereals equal to or lower than the African average (20 to 50% of cultivated land is devoted to this), while observing much higher proportions (10 to 40 %) devoted to the cultivation of protein crops (pulses). All these crops are primarily intended for human

consumption as cultivation of fodder crops is still to gain significant traction. **The production of cereals and oilseeds follows this upward trend, reaching 80.6 MT/year (+ 161% in 20 years, i.e., + 4.9% per year),** with a more pronounced increase in the last 10 years for cereals and oilseeds. The region is thus not only the leader in wheat and barley production in Sub-Saharan Africa, but also in beans and sorghum, and to a lesser extent maize and rice.

The cereal production in the EAIO represents 31 % of agricultural land dedicated to cereals and 40 % of Sub-Saharan Africa's (SSA) cereal production. While maize production is dominant in East Africa and Ethiopia - with Ethiopia, Tanzania, Kenya and Uganda among the top 10 maize producers in sub-Saharan Africa - sorghum and millet production is concentrated in the drier areas of Ethiopia and Sudan, with these two countries ranking respectively 2nd and 3rd sorghum producers and 4th and 8th millet producers in sub-Saharan Africa. Rice, the main cereal grown in Madagascar, is booming in Tanzania, where the country has become, in 20 years, totally self-sufficient and an exporter of the cereal, ranking 2nd rice producer in sub-Saharan Africa, behind Nigeria, but ahead of Madagascar. Barley, wheat and teff are also trademark cereals of the region, which is home to between $\frac{3}{4}$ and all of the production of these cereals in sub-Saharan Africa. Ethiopia is the leading producer of wheat in sub-Saharan Africa, ahead of South Africa, Sudan and Kenya.

The region is also home to 27 % of the pulse land and 40% of its production in Sub-Saharan Africa. While East African countries and Ethiopia are the top 6 African leaders in dry bean production, the region has a great diversity of pulse production which are found particularly in the cropping systems of Ethiopia, Tanzania, Kenya and Sudan.

On matters oilseed production in Sub-Saharan Africa, the region represents 38% of oilseed land and 27% of its production in SSA. While groundnut is the main oilseed crop in the EAIO, Sudan is the second largest producer in Sub-Saharan Africa. The region has also seen a 4.3-fold and a 6.3-fold increase in sesame and sunflower productions respectively over the past 20 year. While Sudan is the leader in sesame production, sunflower production is mainly dominated by Tanzania. Soybean production is still low, but is developing in the regions such as Tanzania and Rwanda. Rapeseed and mustard are still to develop, even if these crops represent an interesting diversification in maize growing areas and in rotation with straw cereals, wheat and barley.

The production of legumes (pulses, groundnuts, soybeans) in EAIO represents then 31% of total production in Sub-Saharan Africa. With a diversified production of legumes, largely dominated by dry beans and groundnuts, the region is one of the leaders in these crops' productions in Sub-Saharan Africa, despite a limited production of soybean in the region.

Increasing consumption, rich in plant protein, but dependent on imports

In most countries in this region, cereals account for more than 50 % of calorie intake (compared with 31 % in France and 44 % worldwide). Cereals also represent a significant source of protein, which varies from country to country and are mainly consumed as grain or flour. Some are also used for beverages or animal feed. The level of self-sufficiency in cereals remains above 80 % for the main countries in the region, and below 20 % for several of them hence demonstrating a significant deficiency in this regard.

Consumption of legumes comprises the protein intake in the region. With the exception of Madagascar, Seychelles and Djibouti, this consumption is higher than the world average, with a record consumption in Rwanda which is the only country where legume consumption exceeds the threshold recommended by the Global Burden of Disease report, coordinated by the Institute for Health Metrics and Evaluation, to reduce the risk of illness and death. Rwanda, Burundi, Tanzania and Ethiopia are the only

countries with legume consumption above the Lancet recommendation. Only Sudan reaches the recommendation threshold for groundnuts, but no country reaches the recommended threshold for soybean products. **Despite cereal production increasing by + 4.8% per year on average over the past 20 years, the population growth and the increase in per capita consumption has led to dependence on imports.** The deficit is also still growing despite an increase in production, particularly for wheat and rice. As far as pulses are concerned, consumption follows production - with slight surpluses depending on the year – but a slight decrease nonetheless observed in recent years. Depending on production level and the countries, the share of imported consumption can also vary significantly.

While for some crops (such as maize), imports are primarily carried out on the regional market, non-EAIO cereal imports are around 5% of the value of non-EAIO imports from these countries. Russia, Ukraine and the EU are the main partners for wheat trade, while India and Pakistan are for rice. Pulse imports are much less important – 5% of the value of cereal imports. Turkey, the USA and, to a lesser extent, Canada and Ukraine are the main trading partners for those crops. With 7.3 MT imported in the form of grains, **wheat is the main imported cereal by EAIO countries.** In addition to this quantity, 0.8 MT wheat flour is also imported, and is destined for countries whose cereal processing capacities remain insufficient. Although Russia is the main exporter of wheat in grain form to the countries of the East African Community (excluding the DRC), it falls second place, behind the EU, when it comes to the Horn of Africa and the Indian Ocean. In regards to wheat flour, Turkey and Egypt, which process grain from Russia and Ukraine, are the leading suppliers. **Although oilseed production has increased significantly in recent years (+ 6.6 % per year, on average over 20 years), local processing falls short hence making it difficult to meet the ever-growing demand.** For vegetable oils, while production has doubled in the last 20 years in the region, imports have multiplied by 7 over the same period. Production costs, selling prices and yields per hectare (much higher for palm oil) are at the root of this trend.

In the EAIO, agricultural production is primarily intended for human consumption, therefore, a small percentage of production is directly intended for animal feed. The sector is thus supplied by the food grain market (corn, sorghum, etc.), the by-products of grain processing or oilseed processing. **The dependence on imports remains dependent on the country and the development of the poultry and pork sectors in particular.** Kenya, Mauritius, Tanzania, Madagascar, Rwanda and Uganda are importers of oilcake for animal feed.

The dual challenge of population growth and food sovereignty

With a demographic growth of + 2.5%/year, the risk of an increasing dependence on imports is particularly high. While the region currently has nearly 400 million inhabitants, there's an estimated 10 million new consumers to be satisfied each year (the equivalent of the population of Paris and its region). Despite the general increase in production, the level of dependence tends to increase for cereals and edible oils. Also significant is the deficit in plant and animal protein. The challenges to be met by food systems are therefore particularly important in order to ensure the food and nutritional security for the population and to guarantee greater national and regional food sovereignty.

Although the efforts made over the last 20 years have led to significant growth in both production and the area under cultivation of said crops, **it is likely that the observed level of performance will not be achieved over the next decade due to climatic constraints and the increase in energy and raw material prices,** which are bound to affect the availability of farm inputs thus weighing on trade.

Factors relating to productivity and weakness in the structure of the agricultural sector often plague the domains. Over the last 20 years, the increase in production has been the subject of different strategies, realities and levers depending on the country, but cereal production has probably benefited from more particular attention, as shown in the above analysis on the factors driving the evolution of cereal and legume production.

Towards a more integrated approach to food systems, favorable to the joint development of cereals and legumes?

While many countries have adopted 10 or 20-year strategies for their agricultural sector, and many donors have committed to financing projects in the domain, the current context invites us to rethink the issues and the means to achieve them. **The "food system" approach is now being given greater prominence and is leading to a more integrated approach to agricultural and nutritional strategies** to strengthen the food security and sovereignty of countries. In this context, interest in oilseeds and to a lesser extent pulse, is growing, even though a combined approach to cereals and legumes, though recognized as relevant, is still not as explored. In cereal, pulse and oilseed production, improving productivity levels is considered a priority area of work, but this is made more complex by the farming systems in place. In some situations, increasing the surface area seems easier to implement, but requires other major investments and may result in conflicts around usage.

Taking into account the repercussions of the sanitary crisis and the war in Ukraine, **many governments have strengthened their input subsidy policies to secure their level of production and food autonomy in the short term.** The AfDB has thus mobilized a large part of the 1 billion USD envelope announced in 2022 to support these African public policies. **In the medium term, however, new approaches, both sectoral and systemic, could be encouraged and deployed.** The search for a more systemic and integrated approach through food systems, considering the multiple benefits of legume cultivation and consumption, could notably take shape in some countries.

Recommendations...

The current context is particularly favorable to revising a certain number of traditional approaches, but this transformation is made complex by the number of factors to be taken into account. Several courses of action can nevertheless be identified and combined to support this transformation of agricultural and food systems.

The promotion of innovation in cultivation practices is an important lever for improving the agricultural productivity of cereals, pulses and oilseeds: while access to quality seeds and inputs remains relevant, control of tillage and sowing conditions, through the deployment of small-scale mechanization and decision support tools, can help to increase yield levels through better control of sowing density and conditions - particularly for the most sensitive crops (wheat, barley, soya, etc.) - and through better management of the crops.) - and by better management of technical itineraries (split fertilizer application, quantity and timing of application, etc.). The promotion of innovations in crop rotations, by introducing new crops into crop rotations (sorghum, cowpeas, soybeans, sunflower, rapeseed, etc.), can also contribute to reducing dependence on imports, strengthening nutritional security, while proposing the deployment of more agro-ecological practices and the establishment of more resilient cropping systems. The promotion of organizational innovation, both at the level of the producer societies and value chains, is equally an important lever, but a more collective and concerted approach between the various actors need nevertheless be set up. This approach is particularly important within the framework of the development of productions, with multiple outlets, and valorized after transformation like oilseeds (oils, oil cakes, etc.).

Strengthening the role of the private sector, supporting investments in the sectors (irrigation, storage, processing, marketing, etc.), securing imports and diversifying sources of supply, or creating and disseminating knowledge (applied research, training, extension and advice) are other levers for

transforming these sectors. Finally, "demonstrator" approaches, such as those proposed by FASEP projects, or the linking of local and international private actors, are particularly appreciated for the innovations and paradigm shifts that can be proposed and are likely to accelerate the transformation of agricultural and food systems.

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