Agriculture
Impact

Jakkie Cilliers
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The impact of the Agricultural Revolution scenario is impressive. By 2043, Africa will produce a total of 703 million metric tons of additional food (crops, meat and fish), which is 1 549 million metric tons more than the Current Path forecast for 2043. With increased domestic food production, Africa's agricultural import bill can be US$327 billion lower in 2043 than would otherwise have been the case.

The increase in available food energy (calories) reduces the number of children suffering from malnourishment by more than 2.4 million in 2043. Thus, from 2024 to 2043, a cumulative number of 44 million fewer children suffer from malnourishment, accompanied by a reduction in stunting. The scenario also reduces infant mortality by almost two children per 1 000 live births under one year of age. Bear in mind that more than 43 million births occurred in Africa in 2019 and that the Current Path forecast is for almost 55 million in 2043. Although infant mortality declines, almost a million fewer children will be born in Africa in the Agriculture scenario than in the Current Path, as health improves and parents generally opt for fewer children.

Chart 12 presents Africa's growing food dependence over time in the Current Path forecast, including demand for crops, meat and fish. In 2019, the continent imported 11% of its agricultural demand, consisting of staple foods such as rice and maize, which are cheaper to procure on the international market than domestically. In the Current Path forecast, net agriculture food import dependence reaches 35% by 2043, whereas the Agriculture scenario reduces the continent's food insecurity to only 8% by 2043.

The averages conceal huge differences between countries and regions (Chart 13). Countries that achieve the most spectacular increases in production volumes (Nigeria, Tanzania, Ethiopia and the DR Congo) are well known for their agricultural potential whereas arid and small island states gain the least. Nigeria, for example, would see an increase from just under 300 million metric tons of agricultural products in 2043 in the Current Path forecast to over 400 million metric tons in the Agriculture scenario.

One of the continent's most agriculturally productive countries, Egypt, is already close to its full agricultural potential and thus was not included in interventions under this scenario. In fact, given the imminent water crisis, Egypt's agriculture production volumes fall somewhat under this scenario, as does Djibouti's, although marginally.

The Agriculture Revolution scenario has significant developmental and economic impacts (Chart 14): [57]

- By 2043, the Agriculture scenario is expected to reduce the number of extremely poor Africans (using US$1.90 as a benchmark) to 358 million instead of 468 million people. This represents 16% of the total population compared with 21% in the Current Path forecast for that year, half of whom are expected to come from West (38 million) and Central Africa (32 million).

- Low-income countries with high agricultural potential, particularly Madagascar and the DR Congo do particularly well. Extreme poverty in the DR Congo is expected to reduce by almost 26 million people in 2043 (to 56 million), which will be equivalent to only 33% of its population by then.

- Levels of poverty are expected to be 28% in 2030 instead of 31%, reflecting the extent to which Africa is set to miss the SDG target of eliminating extreme poverty.
By 2043, Africa’s total economy is expected to be US$562 billion larger (using MER) than in the Current Path forecast. The Agriculture scenario is expected to increase the average GDP per person (in PPP) in Africa by US$338 in 2043 — more than a 5% improvement on the Current Path figure forecast for that year. Regional breakdowns suggest that:

- because of its smaller agricultural sector, North Africa will benefit least, improving its GDP per capita by only 2%, although this still represents an increase of US$256 in GDP per person.

- proportionally, East Africa will benefit most (equivalent to US$401).

- West Africa will benefit most in absolute terms (by US$454).

- GDP per capita in Central Africa will be US$271 more in 2043 than in the Current Path forecast.

The contribution of agriculture as a portion of an economy generally declines as countries graduate from low- to middle- and eventually high-income status. For example, in Africa’s 23 low-income countries, the agricultural sector contributed about 28% to GDP in 2019, about 17% in the 23 lower middle-income countries and about 3% in the six upper middle-income countries. [58] By 2043, these portions will likely have declined to 9%, 7% and 2% for low-, lower middle- and upper middle-income Africa respectively.

Chart 15 shows the average size of the agricultural sector as a percentage of GDP for the two most affected income groups, accounting for 46 of Africa’s 54 countries. The Agriculture scenario would increase the value of the sector by four and two percentage points for low and lower middle-income Africa, equivalent to an increase of US$108 billion and US$162 billion, respectively.

A different expression of the same metric is that in the Agriculture scenario, the sector would contribute 11% of the economy of Central Africa by 2043 (down from 17% in 2019), compared with a more rapid decline to 8% in the Current Path forecast. In addition, the economy of Central Africa will be significantly larger than in the Current Path.

Although the agricultural sector in Southern Africa shows the second least impressive growth in absolute size, the sector already represented only 4% of GDP in 2019, significantly smaller than in other regions. Instead of being US$36 billion in 2043 (as expected in the Current Path forecast), it would be US$52 billion in the Agriculture scenario.

Chart 16 shows the expected change in the size of the agricultural sector in the Agriculture scenario relative to the Current Path forecast for each of the five African regions by 2043. The differences are:

- US$16 billion in Southern Africa

- US$24 billion in North Africa
• US$39 billion in Central Africa

• US$90 billion in East Africa

• US$108 billion in West Africa.

In 2019, the agricultural sector was the largest, as a percentage of GDP, in East Africa (28%) compared with only 4.4% in Southern Africa. Thus, over time West and East Africa emerge as the food baskets of Africa.

However, these improvements are not a given, as they would depend on factors such as the amount of water available for irrigation, the effect of carbon fertilisation due to climate change on crop growth, as well as the impact of new cultivars and genetically modified plants that are more temperature tolerant. [59]

More than half of Africa’s labour force is engaged in the agricultural sector. But like in China, the agricultural sector in Africa is steadily losing its productive, working-age population as young men and women migrate to cities in pursuit of improved livelihoods. The Agriculture scenario accelerates the rate at which employment in the sector declines even as productivity improves and total output increases. However, jobs will be created downstream in the much larger agriprocessing sector by lowering the costs of raw materials. Productivity improvements could come from upgrading value-chain activities such as logistics, input services, storage and other off-farm activities all of which will require improved connectivity and basic infrastructure. [60] Thus, as Africa moves up the agricultural value chain, growth in the sector will expand employment opportunities in downstream agriprocessing, with much of that in urban centres.
Endnotes


5. T Lewis, *Transatlantic slave trade*, 2018


14. World Bank, *Aggregated LPI*

15. World Bank, *Aggregated LPI*

16. Embassy of the DR Congo, *Invest in DRC, Agriculture*


19. In 2003, the New Partnership for Africa’s Development (now called the African Union Development Agency) published its Comprehensive Africa Agriculture Development Programme, with ambitious goals, namely to: allocate at least 10% of national budgets to agriculture; reach rural growth rates of 6% annually by 2015; integrate and invigorate regional and national agricultural markets; significantly increase agricultural exports; transform Africa into a ‘strategic player’ in global agricultural science and technology; practise sound environmental and land management techniques; and reduce rural poverty (see: M Fleshman, *Boosting African farm yields*, 2014).

20. The commitment to devote at least 10% of national budgets to agriculture and rural development was also included in the 2003 Maputo Declaration by African heads of state and reiterated in the 2014 Malabo Declaration on Accelerated Agricultural Growth and Transformation in Africa.

21. On aggregate, Africa spends only 5–7% of national budgets on agriculture, although a 2018 study found that 11 African countries did manage to allocate 10% or more of their budgets to agriculture in some years since 2005, with Ethiopia, Kenya, Mozambique and Sierra Leone achieving 6% agricultural

22. AllAfrica, *Communique: Africa food security leadership dialogue*, August 5, 2019

23. IPPMedia, *Value add in Africa: First steps in a long journey*, 2019; also see: African Cashew Alliance, *About us*

24. The world cocoa industry is worth more than US$100 billion annually; also see: Y Adegoke, *Why Europe dominates the global chocolate market while Africa produces all the cocoa*, 2018; D Philling, The African farmers taking on big chocolate, *Financial Mail*, 16 December 2019; H Fofack, *Overcoming the colonial development model of resource extraction for sustainable development in Africa*, 2019


31. World Bank, *Agriculture in Africa: Telling facts from myths*


33. World Bank, *Agriculture in Africa: Telling facts from myths*

34. In contrast to the tripling in growth cited earlier, this was an improvement across the entire country, so the growth is understandably much smaller; see: JY Lin, *The Household Responsibility System in China’s Agricultural Reform: A Theoretical and Empirical Study*, *Economic Development and Cultural Change*, 36:3, 1988, S199–S224

35. China-Africa Project, Chinese and African agriculture have a lot more in common that most people think: *Interview with Xinqing Lu, Associate Programme Officer for Alliance for a Green Revolution in Africa*, 3 December 2019

36. OEC, Brazil


38. L Abboud, *The robot revolution down on the farm*, 2018


40. R Kimani and P Bosire, *FarmDrive*, 2019

41. In most of rural Africa, precise location of a farm is objectively unknown so the location is determined via a series of SMS questions (e.g. time to walk to different primary schools). The more schools a farmer is familiar with in their area, the easier it is to hone in on their specific location.

42. J Bird, *'Smart' insurance helps poor farmers to cut risk*, *Financial Times*, 5 December 2018; also see, for example, https://agrocenta.com/ and https://www.zenvus.com/.

44. S Gebre, AGRA plans to invest $500 million in African seed companies, Bloomberg, 7 September 2016

45. The Alliance for Food Sovereignty in Africa and its allied organisations argue that ‘AGRA has unequivocally failed in its mission to increase productivity and incomes and reduce food insecurity, and has in fact harmed broader efforts to support African farmers.’ See: Various co-signatories, Open letter: The Green Revolution in Africa has unequivocally failed, 15 September 2021


47. Ammonia manufacturing contributes 1% of worldwide carbon dioxide emissions. See LK Boerner, Industrial ammonia production emits more CO2 than any other chemical-making reaction. Chemists want to change that, *Chemical & Engineering News*, 15 June 2019


49. Indorama Petrochemicals, About IEPL, Port Harcourt


54. Food and Agriculture Organization, Food wastage: Key facts and figures

55. InspiraFarms, Our team

56. The improvements in yields are similar in magnitude to the improvements seen in South Asia between 1980 and 2020, and in a similar timeframe. Indeed, South America achieved a much more rapid increase between 2000 and 2010, moving from roughly 7.8 tons per hectare to about 11.8 tons.

57. Chart 14 presents the reduction in extreme poverty in African countries across the low- and middle-income categories. The reduction in extreme poverty in Seychelles, Africa's only high-income country, is negligible.

58. The contribution of agriculture as a proportion of the Seychelles' economy, the continent's only high-income island state, was about 4% in 2019.

59. Some of these constraints can be overcome through technology, such as the use of precision irrigation and application of precise amounts of fertiliser exactly where they are required. Then there is also the potential of vertical farming, which could produce 180 m tons of food globally, according to some analysts.


61. Food and Agriculture Organization, Government expenditure on agriculture, 2019


63. Intergovernmental Panel on Climate Change, Working Group II: Impacts, adaptation and vulnerability, 2018


65. The International Institute of Tropical Agriculture does particularly impressive work in this regard. See: https://www.iita.org/
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