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# Agricultural investments and capital stock 2000–2020

Global and regional trends

## HIGHLIGHTS

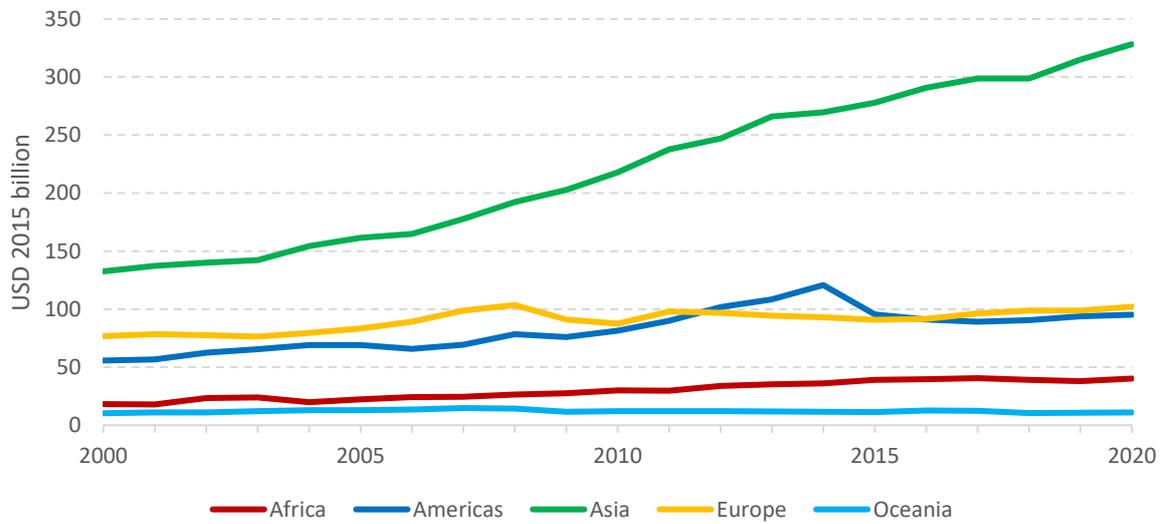
- **Between 2016 and 2020, global gross fixed capital formation (GFCF) in agriculture, forestry and fishing increased by 2.3 percent yearly, from USD 526 billion to USD 577 billion in constant 2015 prices.**
- **Over the last five years, GFCF increased the fastest in Asia (+3.1 percent on average each year), followed by Europe (+2.7 percent), the Americas (+1.2 percent) and Africa (+0.3 percent); it decreased in Oceania.**
- **The global net capital stock in agriculture, forestry and fishing reached USD 6.4 trillion in 2020, up from USD 3.7 trillion in 2000.**
- **The agricultural investment rate increased the most in high- and middle-income countries, while the agricultural sector is less capital-intensive in low-income countries.**

## CAPITAL STOCK

### GLOBAL AND REGIONAL

Annual flows of physical investment in the agriculture sector, measured by the gross fixed capital formation (GFCF) in agriculture, forestry and fishing, increased by 3.4 percent on average each year between 2000 and 2020 (from USD 293 billion to USD 576 billion), compared to 2.3 percent over the 2016–2020 period. Between 2000 and 2020, agriculture GFCF went from USD 133 billion to USD 328 billion in Asia, USD 77 billion to USD 102 billion in Europe, USD 56 billion to USD 95 billion in the Americas, USD 18 billion to USD 40 billion in Africa and USD 10 billion to USD 11 billion in Oceania (see Figure 1). Over the last five years, the fastest average annual increase of the GFCF was observed in Asia (3.1 percent), followed by Europe (2.7 percent), the Americas (1.2 percent) and Africa (0.3 percent); Oceania is the only region showing a decrease in investments, with an average annual rate of -3.4 percent.

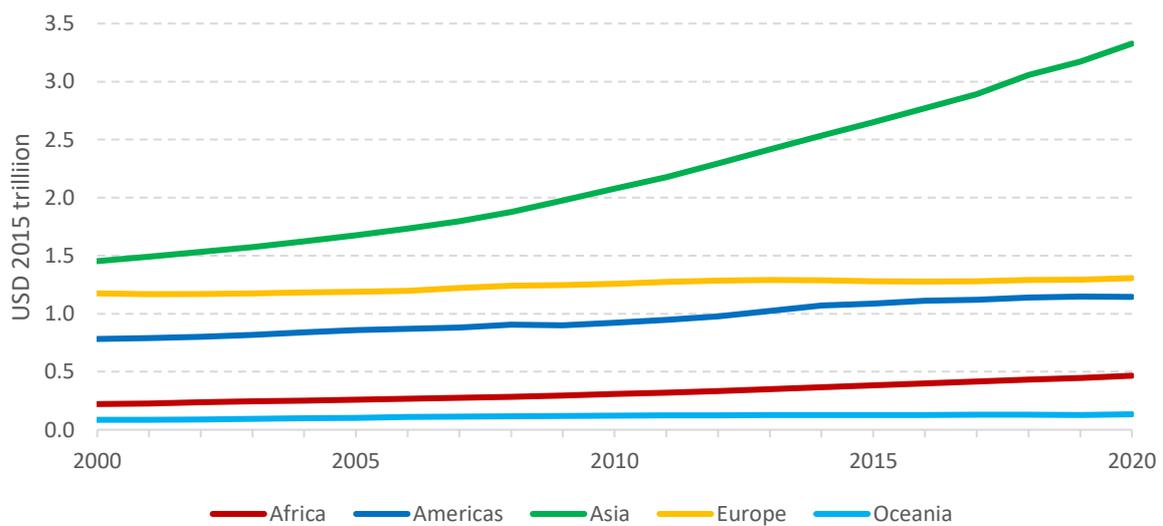
**Figure 1: GFCF in agriculture, forestry and fishing by region**



**Source:** FAO, 2021.

The global net capital stock in agriculture, forestry and fishing reached USD 6.4 trillion in 2020, up from USD 3.7 trillion in 2000 – an average annual increase of 2.7 percent compared to 2.9 percent during the 2016–2020 period. Between 2000 and 2020, net capital stock in agriculture, forestry and fishing increased from USD 1.5 trillion to USD 3.3 trillion in Asia, USD 1.2 trillion to USD 1.3 trillion in Europe, USD 0.8 trillion to USD 1.3 trillion in the Americas, USD 0.2 trillion to USD 0.5 trillion in Africa and USD 86 billion to USD 133 billion in Oceania. Over the last five years, the average annual growth rate of the net capital stock in agriculture, forestry and fishing has been the fastest in Asia (4.7 percent), followed by Africa (+3.9 percent), Oceania (+1.1 percent), the Americas (+0.7 percent) and Europe (+0.6 percent).

**Figure 2: Net capital stock in agriculture, forestry and fishing by region**



**Source:** FAO, 2021.

Globally, the agricultural investment ratio (AIR), defined as the share of agriculture GFCF in agriculture value added, improved in the last two decades, increasing from 13.7 percent in the 2000–2005 period to 15.8 percent in the 2016–2020 period (Table 1). At the regional level, the AIR presents a general upward trend, with the exception of Oceania in 2011–2015 and the Americas and Europe in 2016–2020. Over the last two decades, the AIR increased the most in Europe, from 28.3 percent to 34.7 percent, followed by Oceania (from 9.5 percent to 11.2 percent), Asia (from 11.9 percent to 13.6 percent), Africa (from 8.6 percent to 9.6 percent) and the Americas (from 9.7 percent to 10.1 percent).

**Table 1: Average annual agricultural investment ratio by region (percent)**

|                 | 2000–2005 | 2006–2010 | 2011–2015 | 2016–2020 | 2000–2020 |
|-----------------|-----------|-----------|-----------|-----------|-----------|
| <b>Africa</b>   | 8.6       | 8.6       | 9.5       | 9.6       | 9.1       |
| <b>Americas</b> | 9.7       | 10.2      | 10.5      | 10.1      | 10.1      |
| <b>Asia</b>     | 11.9      | 12.2      | 12.8      | 13.6      | 12.6      |
| <b>Europe</b>   | 28.3      | 33.9      | 35.1      | 34.7      | 33.0      |
| <b>Oceania</b>  | 9.5       | 11.1      | 10.5      | 11.2      | 10.6      |
| <b>World</b>    | 13.7      | 15.2      | 15.7      | 15.8      | 15.1      |

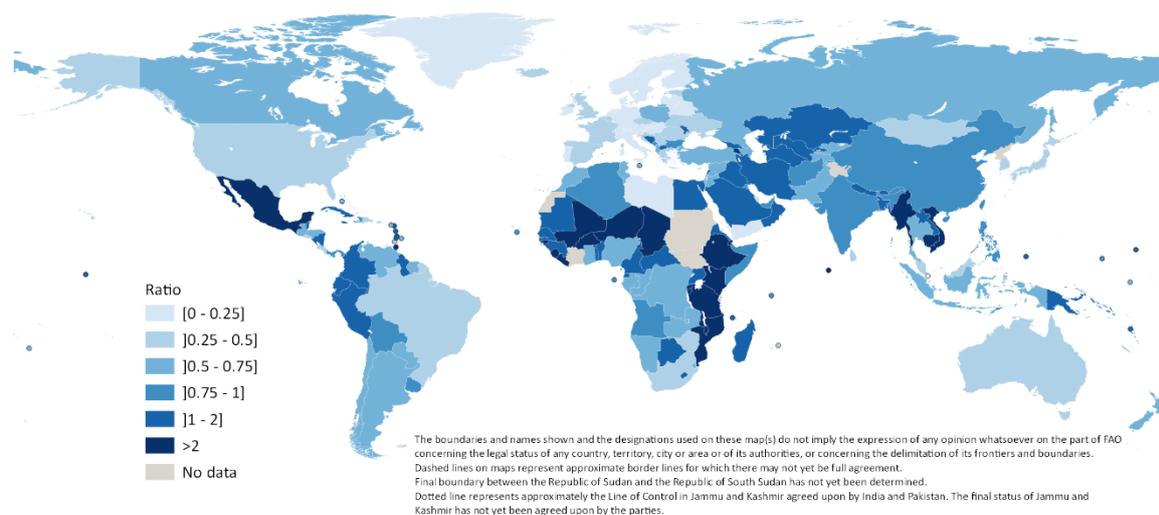
Source: FAO, 2021.

Despite lower average growth rates in physical investment flows compared to Asia, developed economies continue to present higher investment ratios, resulting in more capital-intensive agricultural sectors than in low-income countries.

## COUNTRY

The ratio of the agriculture value added to net capital stock, by capturing how many units of value added in agriculture are generated from each unit of agricultural capital stock, is below 0.5 in most of the high-income countries, meaning that the agricultural production is heavily mechanized. In many low- and lower middle-income countries, the ratio is above one, indicating a less capital-intensive agricultural sector (Figure 3).

**Figure 3: Ratio of agriculture value added to net capital stock ratio, 2000–2020 average**



Source: FAO, 2021 based on UN Geospatial, 2020.

## EXPLANATORY NOTES

The capital stock database of the Food and Agriculture Organization of the United Nations (FAO) reports on aggregate physical investment flows and capital stock in agriculture, forestry and fishing for 190 countries and territories from 1995 to 2020. Variables contained in the database are the gross fixed capital formation (GFCF), the net (or wealth) capital stock (NCS) and the consumption of fixed capital (CFC), measured according to the methodological and computational concepts of the System of National Accounts (SNA) 2008. Whenever available, the database integrates official national accounts data harvested from UNSD or the OECD.

Only a subset of the member countries reports official data on all required variables for the reference period of the dataset. When information is not available, or is only partially available from official sources, missing data are estimated. Agricultural investment flows are computed from time series of agricultural investment-to-value-added ratios, available from previous research programmes held at the World Bank and at FAO. The time series on agricultural capital stock result from the application of the perpetual inventory method (PIM) to agricultural investment flows. Time series showing missing data are integrated with exogenous information.

According to the System of National Accounts 2008, capital stock is defined as the *value of all fixed assets in use*, where fixed assets are described as produced assets (i.e., excluding land) that are used repeatedly in the agricultural production process for more than one year. Capital stock series can be assessed as *net* or *gross*. Gross capital stock measures the value of all the fixed assets in use based on at the price of new assets, regardless of the age. That is, gross stocks ignore the depreciation of fixed assets, and consider past investments as new, taking into account only the retirement. Net capital stocks, instead, correspond to the value of gross capital stock minus depreciation; that is, the cumulative value of consumption of fixed capital. The decline in the value of fixed assets occurs due to physical and economic deterioration, where the latter includes obsolescence. Based on these criteria, estimates of agricultural net capital stocks are obtained through the PIM.

The PIM allows estimating agricultural capital stock and consumption of agricultural fixed capital starting from a time series of agricultural gross fixed capital formation. In particular, agricultural net capital stock is modelled as a sum of the past investments in agricultural fixed assets that are still in use after correcting for depreciation. The agricultural net capital stock for country  $i$  at the end of period  $t$ ,  $NCS_{i,t}$ , can be written as a function of agricultural net capital stocks at the end of previous period,  $NCS_{i,t-1}$ , of agricultural gross investment in the current period,  $GFCF_{i,t}$ , and of consumption of agricultural fixed capital,  $CFC_{i,t}$ :

$$NCS_{i,t} = NCS_{i,t-1} + GFCF_{i,t} - CFC_{i,t}$$

When  $GFCF$  is missing, estimation procedures are applied to gauge it from the Agricultural Investment Ratio (AIR), which is defined as

$$AIR_{i,t} = \frac{GFCF_{i,t}}{VA_{i,t}}$$

where  $VA_{i,t}$  is the agricultural value added for country  $i$  in year  $t$ . Therefore, the  $AIR$  represents  $GFCF$  as a share of  $VA$  in agriculture, which indicates how much of the total factor income is reinvested in new fixed assets.

A thorough description of the methodology employed to obtain the capital stock data published in FAOSTAT is available from Vander Donckt and Chan (2019).

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