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Agricultural investments and capital stock 2011–2021

Global and regional trends

>> FAO Statistics Division

HIGHLIGHTS

- → **Between 2011 and 2021, global gross fixed capital formation (GFCF) in agriculture, forestry and fishing increased by 2.2 percent yearly, from USD 458 billion to USD 571 billion in constant 2015 prices.**
- → **Over the last three years, GFCF increased the fastest in Oceania (4.8 percent on average each year), followed by Asia (3.9 percent) and Europe (1 percent); it decreased in the Americas and Africa.**
- → **The global net capital stock in agriculture, forestry and fishing reached USD 6.2 trillion in 2021, up from USD 4.7 trillion in 2011.**
- → **The agricultural investment rate increased the most in Asia and Africa, followed by a rise in the capitalization of the agricultural sector recorded by the ratio of the value added to net capital stock.**

CAPITAL STOCK

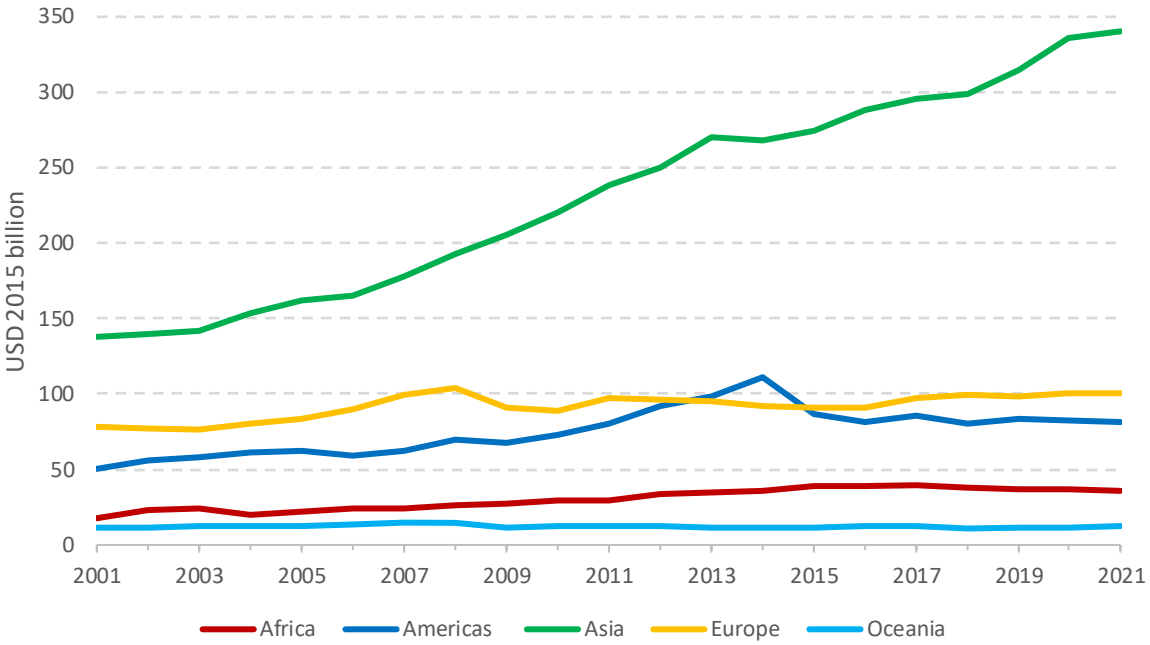
GLOBAL AND REGIONAL

From 2011 to 2021, the GFCF in agriculture, forestry and fishing, which measures the annual flows of physical investment in the agricultural sector, increased globally from USD 458 billion to USD 571 billion, recording a yearly average increase of 2.2 percent, which is lower compared to the growth recorded in the previous decade (2001–2010) of 4.9 percent (Figure 1).

In the last decade, GFCF in agriculture increased the most in Asia from USD 238 billion to USD 340 billion (+3.6 percent average annual growth), followed by Africa with a rise from USD 29 billion to USD 36 billion (+1.9 percent average annual growth). In Europe, GFCF in agriculture went from USD 97 billion to USD 101 billion in the same period (+0.3 percent average annual growth), while in the Americas and Oceania it remained fairly stable around USD 82 billion (+0.1 percent average annual growth) and USD 12 billion (+0.1 percent average annual growth), respectively.

The most recent trend from 2019 to 2021 records an average yearly growth of 2.3 percent at the global level, in line with the longer trend. Oceania exhibited the fastest yearly growth of GFCF in agriculture 4.8 percent), followed by Asia (3.9 percent) and Europe (1 percent). GFCF decreased by 0.9 percent on average each year in the Americas and by 2.2 percent in Africa.

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



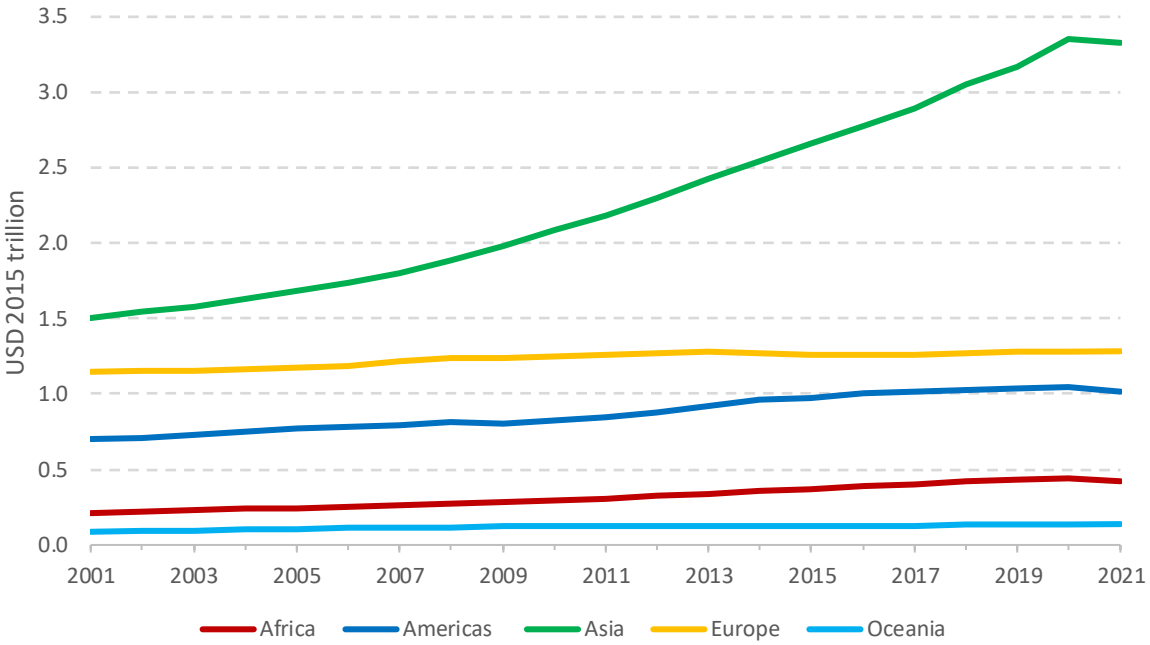
Source: FAO. 2022. FAOSTAT: Capital stock. In: *FAO*. Rome. Cited December 2022. https://www.fao.org/faostat/en/#data/CS

At the global level, the net capital stock (NCS) in agriculture, forestry and fishing increased from USD 4.7 trillion to USD 6.2 trillion over the 2011–2021 period, recording an annual average growth rate of 2.7 percent, presenting a slight increase compared with the average growth of 2.5 percent recorded in the 2001–2010 decade (Figure 2).

The NCS in agriculture went from USD 2.2 billion to USD 3.3 billion in Asia (4.3 percent average annual growth), from USD 308 million to USD421 million in Africa (3.2 percent average annual growth), from USD 846 million to USD 1 015 million in the Americas (1.9 percent average annual growth), from USD 123 billion to USD 138 billion in Oceania (1.1 percent average annual growth) and from USD 1.26 billion to USD 1.28 billion in Europe (0.2 percent average annual growth).

From 2019 to 2021, the global NCS in agriculture shows an average annual growth of 1.2 percent, led by Asia (2.5 percent), Oceania (2.4 percent) and Europe (0.2 percent). In the same period, the NCS in agriculture decreased by 1.1 percent on average each year in the Americas and Africa. The slowdown in the growth of the global NCS is due to the stability of the estimated values of GFCF in 2021 (+0.6 percent) compared to 2020, indicating an interruption in agricultural investments during the COVID-19 pandemic period that was characterized by high economic uncertainty.

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



Source: FAO. 2022. FAOSTAT: Capital stock. In: *FAO*. Rome. Cited December 2022. https://www.fao.org/faostat/en/#data/CS

In the last decade, the agricultural investment ratio (AIR), defined as the share of agriculture GFCF in agriculture value added, increased at the global level to 15.5 percent from 14.5 percent recorded in the 2001–2010 period (Table 1). In the 2019–2021 period, the global AIR went up to 15.6 percent, led by Asia.

At the regional level, between 2011 and 2021, the AIR presents a general upward trend compared with the previous decade, with remarkable increases in Asia (which increased from 12.1 percent to 13.2 percent). In the same period, the AIR in Africa went up from 8.1 percent to 8.7 percent, in the Americas from 9.8 percent to 9.9 percent and in Oceania from 10.4 percent to 10.6 percent. In Europe, the AIR decreased from 37 percent to 35.1 percent.

From 2019 to 2021 however, Africa, the Americas and Oceania recorded a slowdown compared with the 2016–2018 period, while the pace in Asia continued to increase. In contrast, the trend in Europe dropped from 2011 to 2015, reaching the minimum of 30.9 percent, and then increased to 35.1 percent in 2021.

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

	2016–2018	2019–2021	2001–2021	2001–2010	2011–2021
Africa	9.55	9.06	8.85	8.52	9.14
Americas	9.70	9.60	9.75	9.62	9.87
Asia	13.35	13.98	12.49	11.77	13.14
Europe	32.85	34.29	33.35	32.29	34.32
Oceania	11.49	10.73	10.52	10.18	10.84
World	15.39	15.63	15.04	14.50	15.52

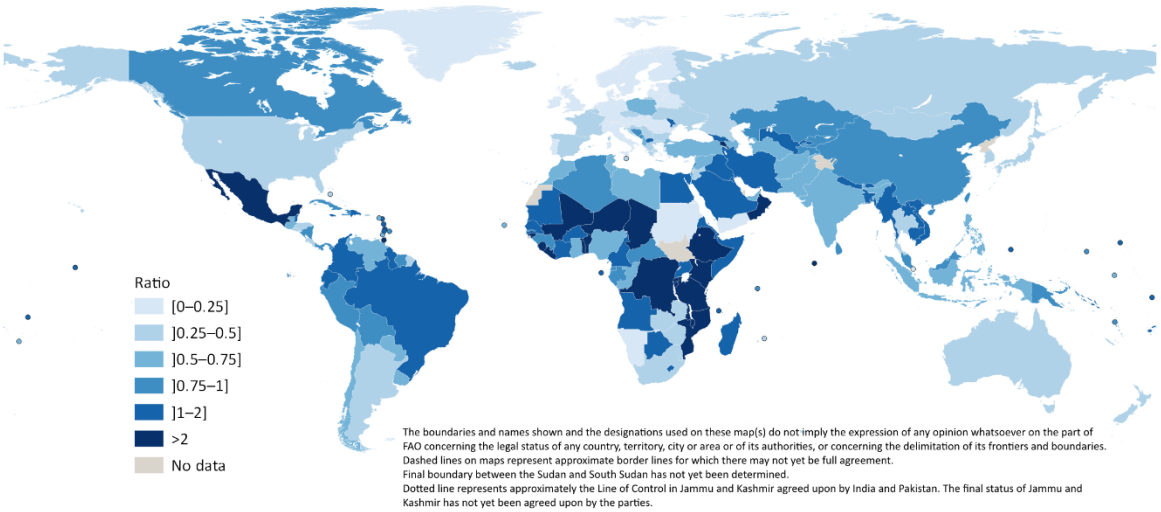
Source: FAO. 2022. FAOSTAT: Capital stock. In: *FAO*. Rome. Cited December 2022. https://www.fao.org/faostat/en/#data/CS

Europe is the region with the highest homogeneity of capitalization across countries, with an average AIR above 34 percent in the last decade. The level of GFCF is more heterogeneous in the other regions, especially the Americas and Asia where the agricultural sector, on average, is less capital-intensive despite the high level of investments.

COUNTRY

The ratio of the agriculture value added to NCS measures how one unit of capital stock contributes to the generation of value added in the agriculture, forestry and fishing sectors. Figure 3 shows that, on average, in the 2011–2021 period the ratio is above one mainly in low- and lower middle-income countries. This indicates that the agricultural value added is determined by labour and other factors more than by capital and that the agricultural sector is less capital-intensive than in high-income countries.

Figure 3: Ratio of agriculture value added to net capital stock, 2011–2021 average



Source: FAO. 2022. FAOSTAT: Capital stock. In: *FAO*. Rome. Cited December 2022. https://www.fao.org/faostat/en/#data/CS based on UN Geospatial. 2020. Map geodata [shapefiles]. New York, USA, UN.

Further, data at the national level show that the variability over time of the value added to net capital stock ratio, since 1995, is low in almost all countries of the Organisation for Economic Co-operation and

Development (OECD), indicating a high level of positive correlation in the growth rate of both value added and capital stock in agriculture, implying a high stability in the level of capitalization of the agricultural sector. Among these countries, Austria, Switzerland and the Netherlands show the lowest levels of variability, with the value added to net capital stock ratio presenting a flat trend. However, the variability over time is larger in many non-OECD countries, and it is even larger for lower-income countries. In such cases, the data indicate that the agricultural capital stock grows faster than value added in agriculture, improving over time the level of agricultural capitalization of the country. Clear examples are Djibouti and Myanmar, for which the value added to net capital stock ratio decreased from an average of 6.3 in 1995–1998 to 1.9 and 1.3, respectively, in 2019–2021.

EXPLANATORY NOTES

The Food and Agriculture Organization of the United Nations (FAO) Capital Stock domain reports on aggregate physical investment flows and capital stock in agriculture, forestry and fishing for 190 countries and territories from 1995 to 2021. 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 the United Nations Statistics Division (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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