

Will Africa's Agricultural Sector Survive Climate Change? Behavioral, Technological and Institutional Aspects

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Advisory Committee
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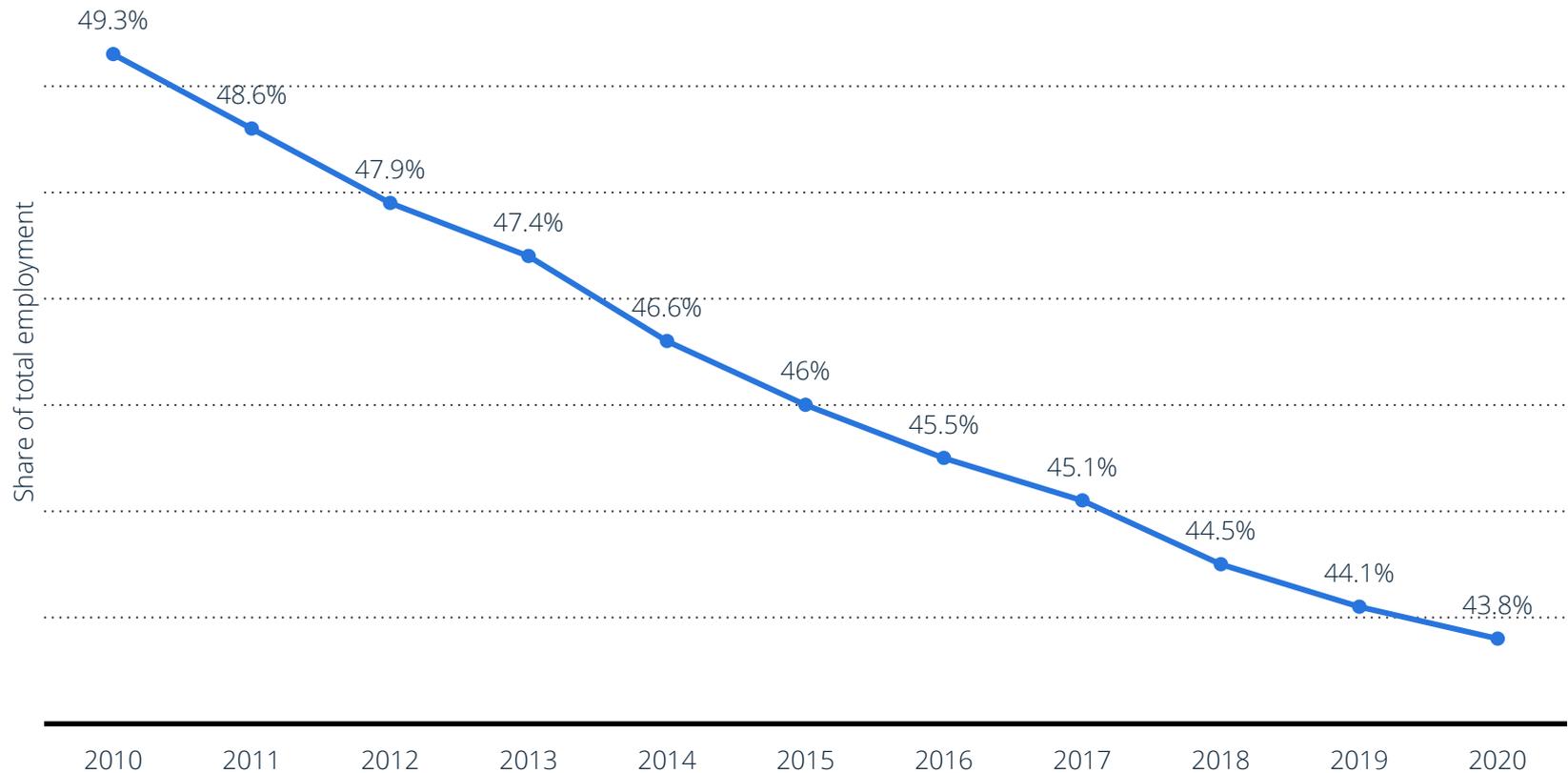


Why is that question important?

- Agriculture is one of the most vulnerable sectors to climate change
- Agriculture is one of the main sectors in Africa (employment— 45-50%, share in GDP— 15-20%).
- Therefore, the performance of agriculture shapes the performance of Africa's economies.
- So, it is important to ask whether Africa would survive climate change. X



Employment in agriculture as a share of total employment in Africa from 2010 to 2020 X



Source: **statista** 

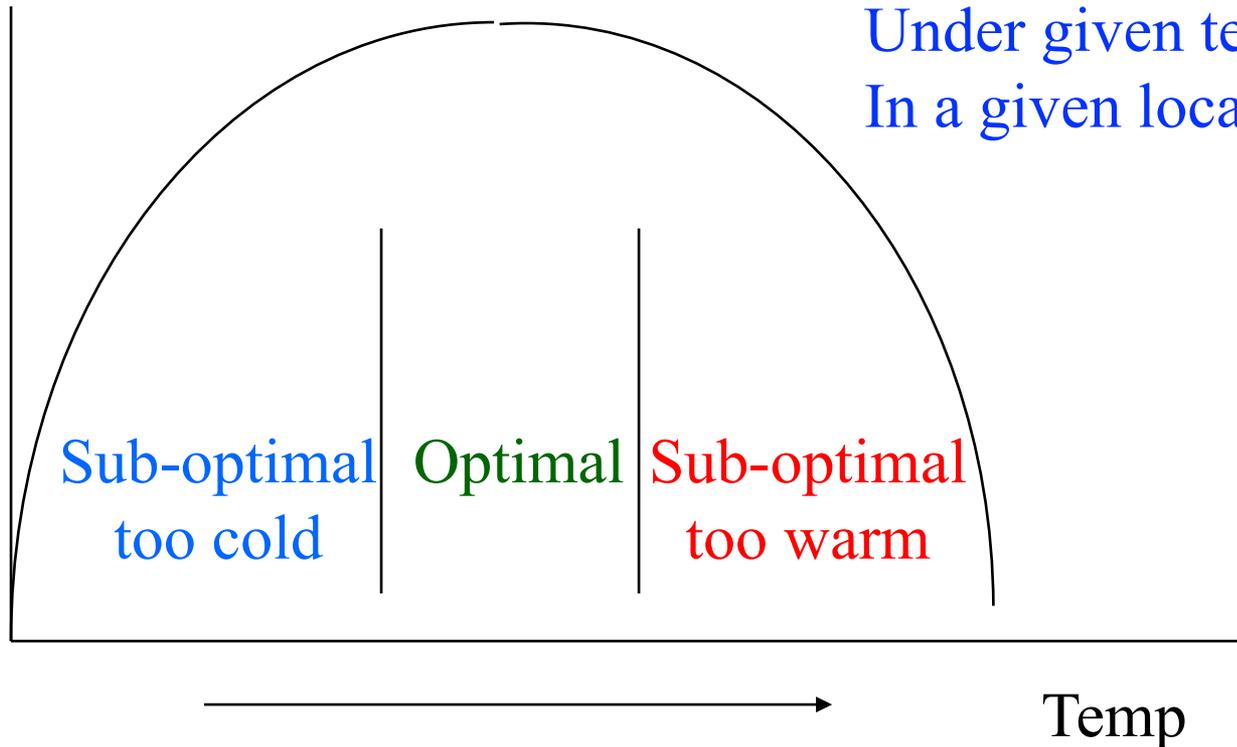
Share of Ag GDP:

<https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?end=2022&locations=ZG&start=1981&view=chart>

Impact of Climatic Variables on (Agricultural) Performance

Yield/Performance

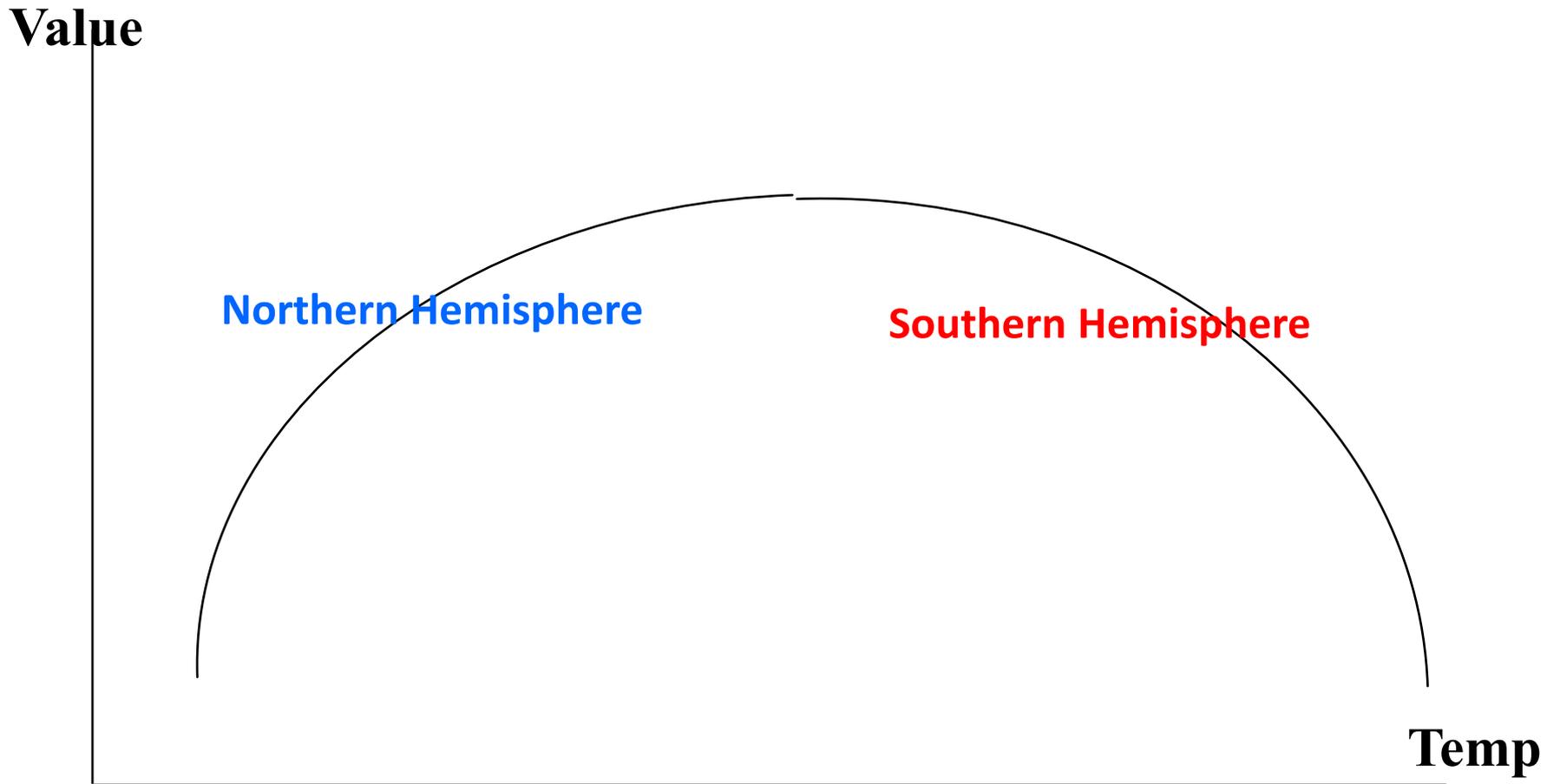
For a given crop/animal
Under given technology
In a given location



Current Observed Mean Temperature and Precipitation in Each Region of the World

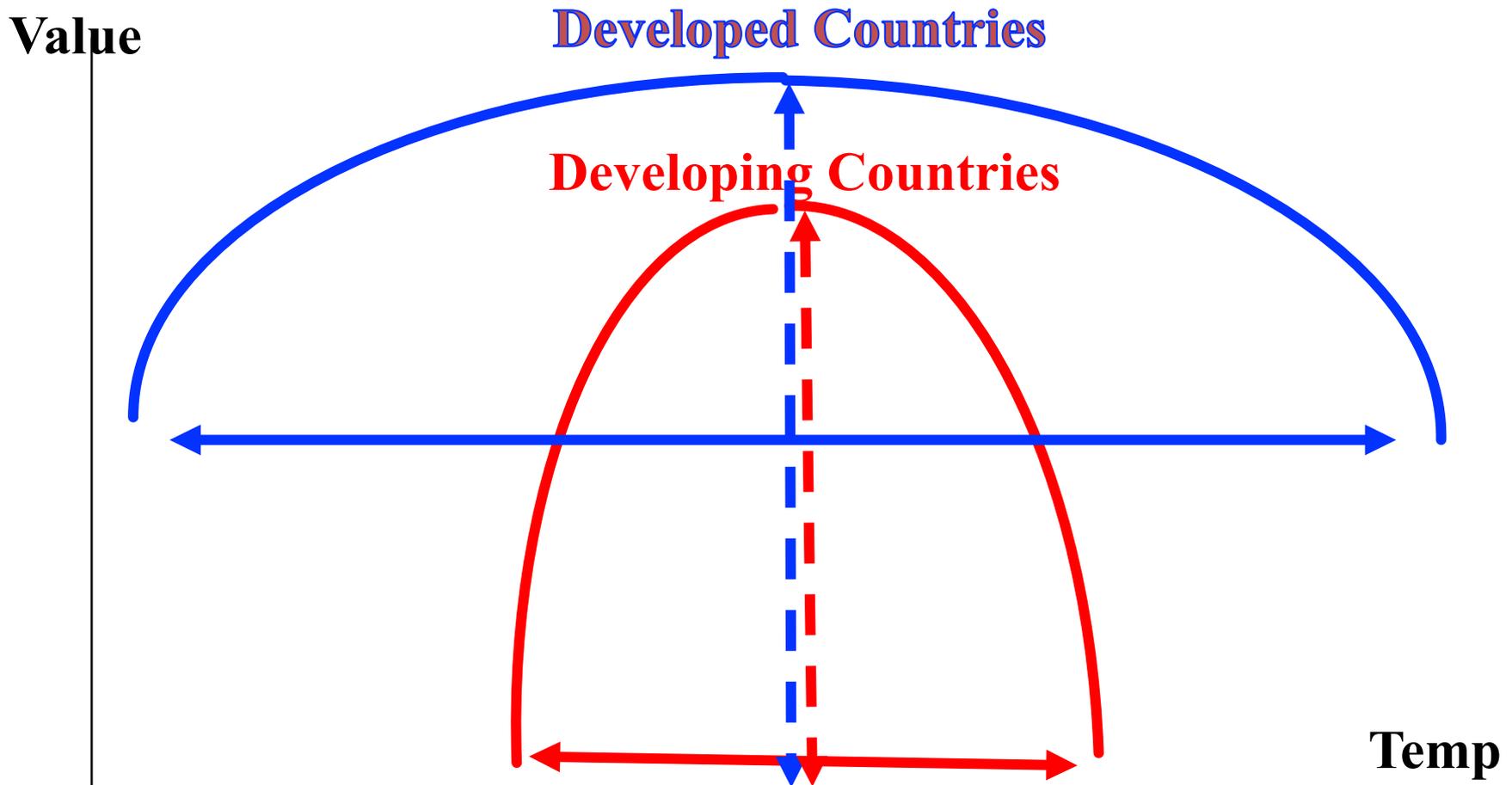
<u>Region</u>	<u>Temperature</u> (C)	<u>Precipitation</u> (mm/month)
Africa	29.1	7.2
South Asia	28.5	10.0
Latin America	25.9	11.9
Pacific	29.6	18.3
North Asia	19.7	7.4
North America	19.5	8.0
Europe	13.7	6.1
Former Soviet Union	12.0	4.8

Climate sensitivity situation

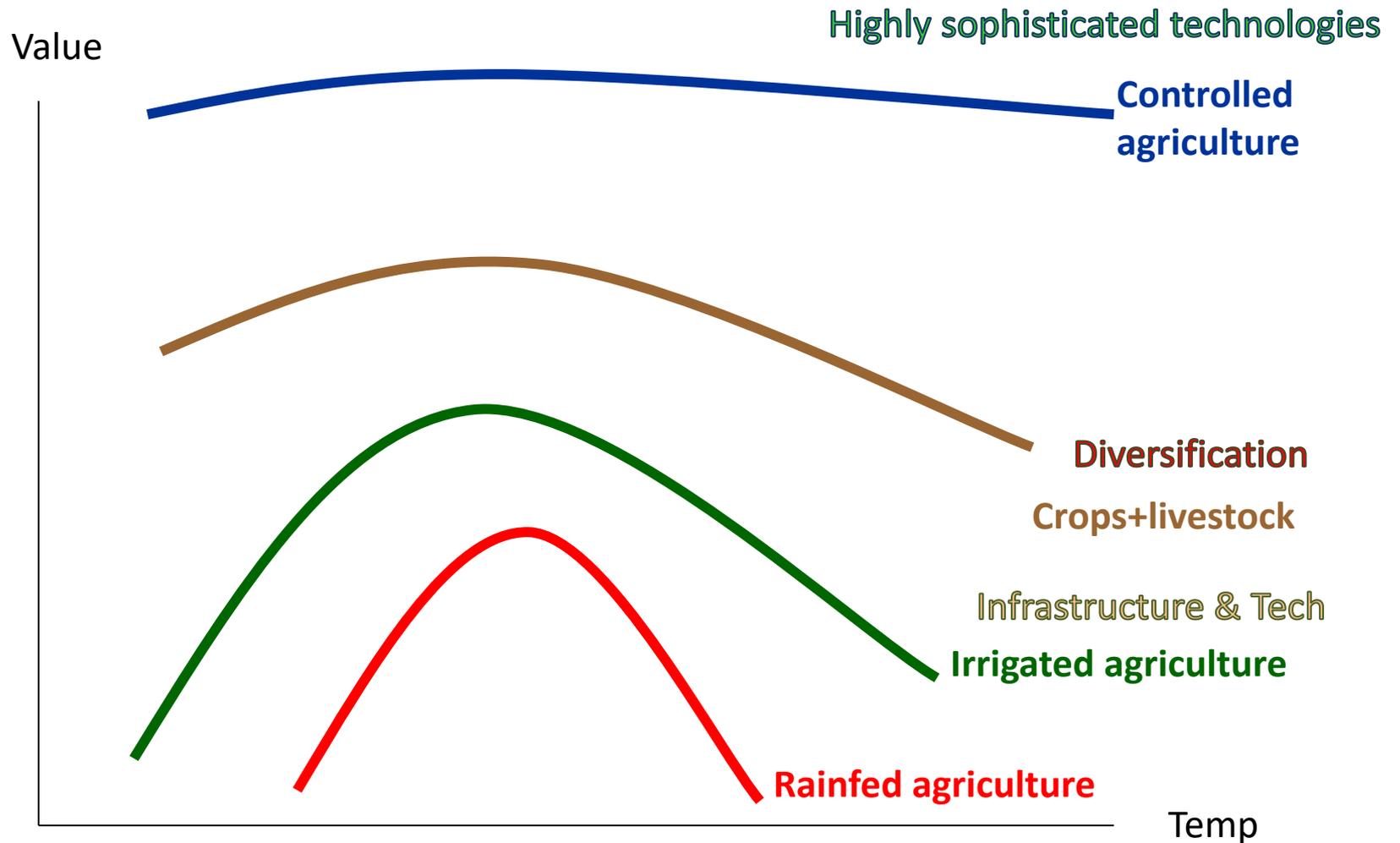


Climate Sensitivity

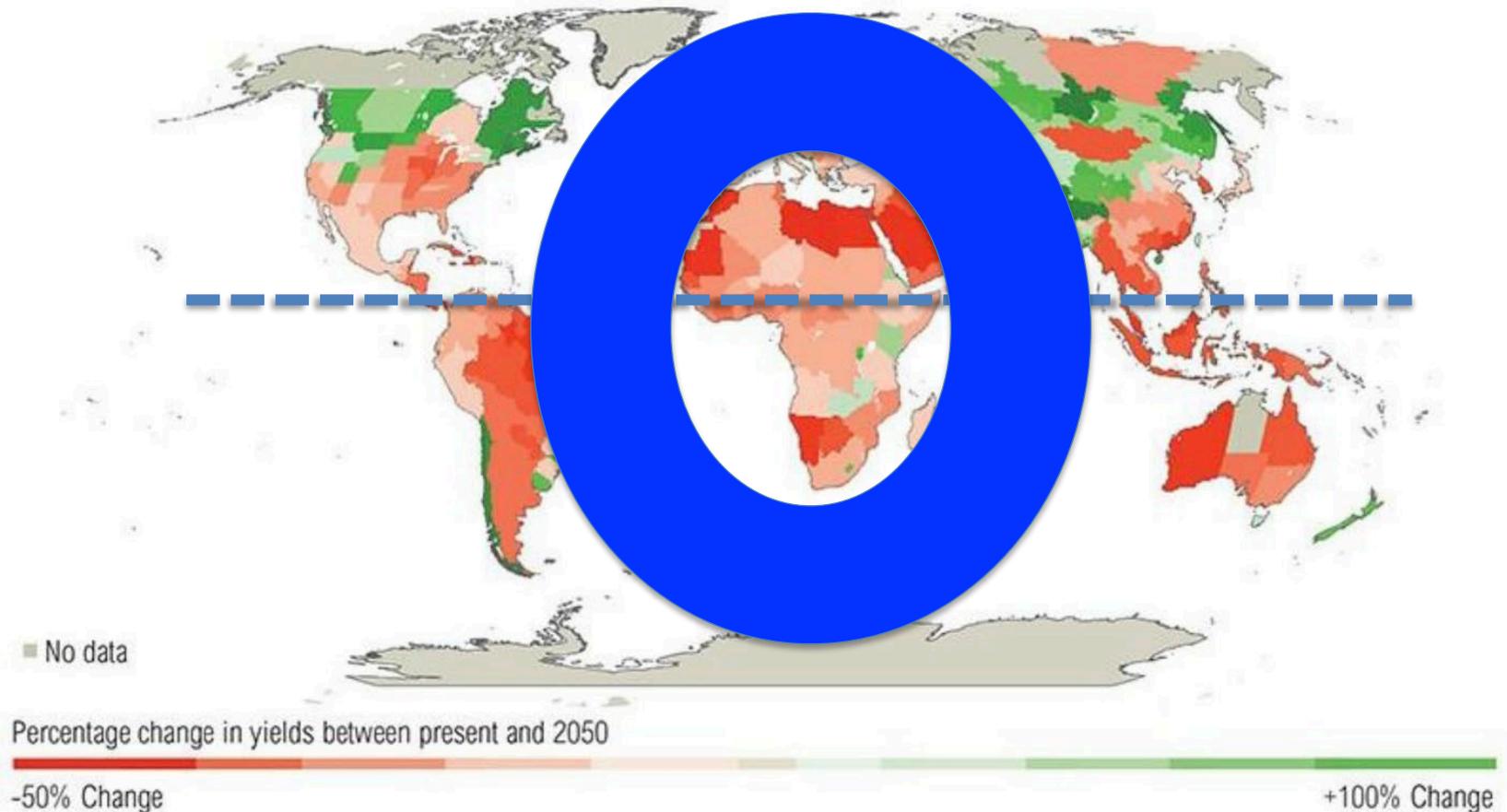
Developed and Developing Countries



Overall Relationships



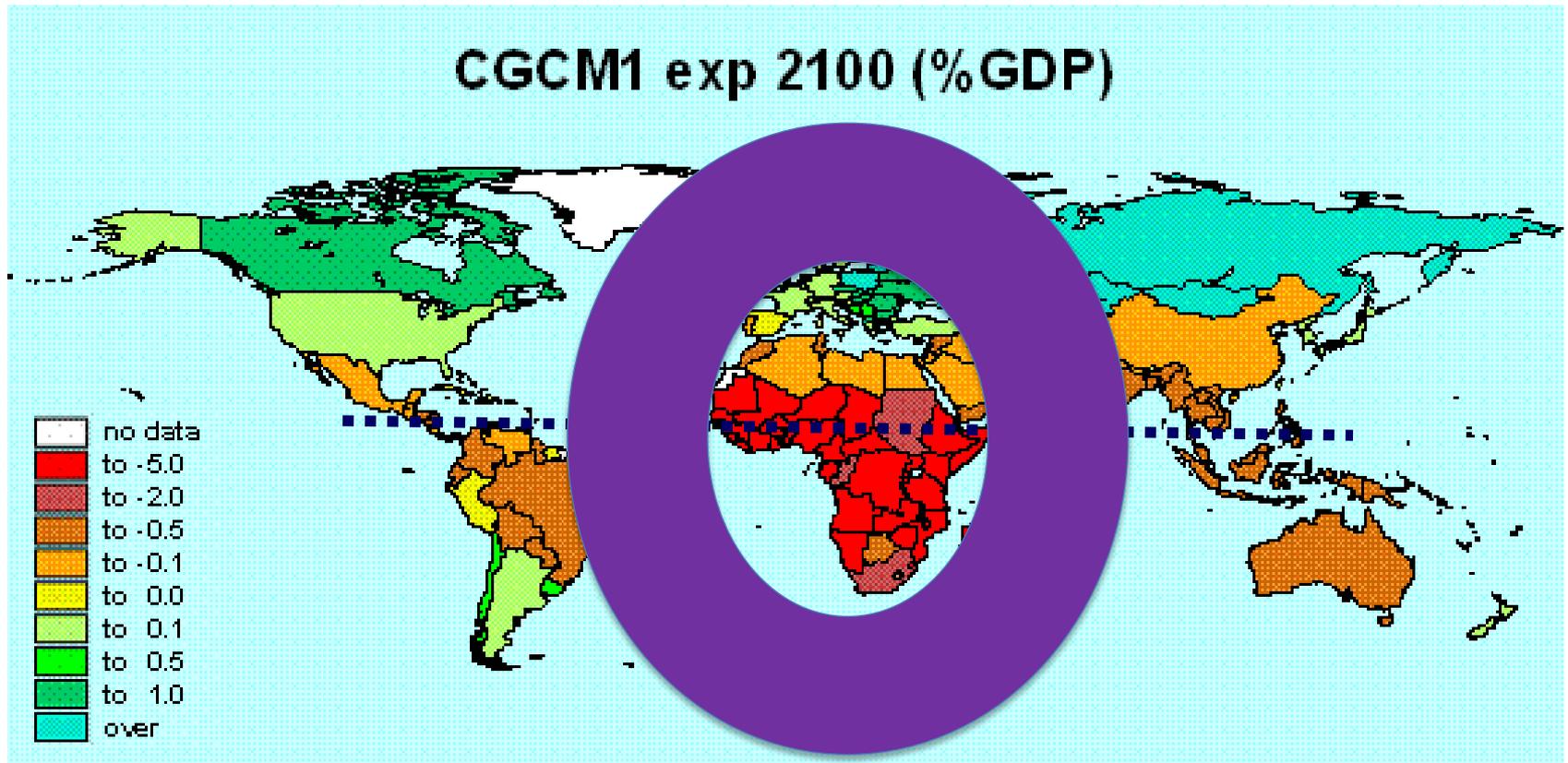
Projection of percentage changes in crop yields due to climate change impacts by 2050.



Source: World Resources Institute (n.d.).

<https://www.wri.org/insights/global-food-challenge-explained-18-graphics>

Uneven Impact of Climate Change on GDP Loss



Uneven impacts, Southern Hemisphere mostly affected, SSAfrica the worst

Africa's Problems in a nutshell

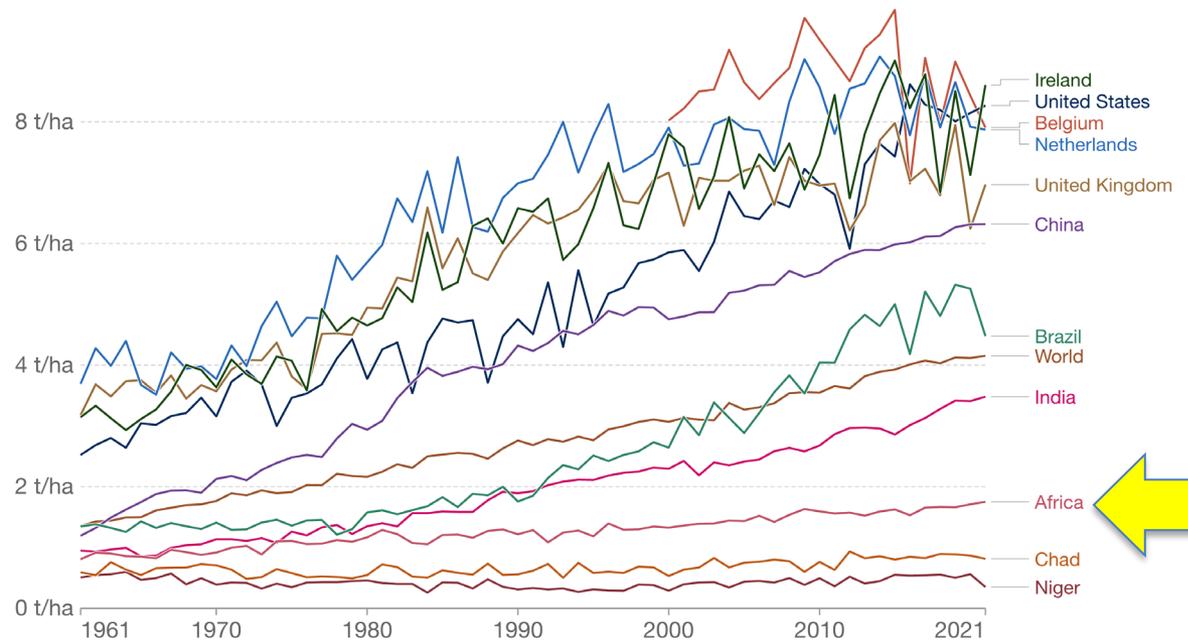
Increasing agricultural productivity across Sub-Saharan Africa is one of the most important problems this century

- Location
- Development
 - Technology
 - Education
 - Governance
 - Information

Cereal yield, 1961 to 2021

Yield is measured as the quantity produced per unit area of land used to grow it.

Our World
in Data



Source: UN Food and Agriculture Organization (FAO)

Note: Cereals include wheat, rice, maize, barley, oats, rye, millet, sorghum, buckwheat, and mixed grains.

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Countries in the 2006 Climate Change Study



A GEF-funded study.
Data from 11,000;
11 countries representing
Africa's
agricultural sector.

Results (1)

Kurukulasurya et al. 2006

Results in WPs books and technical papers of CEEPA, Pretoria

- Sub-Saharan Africa is predicted to be particularly **hard hit by global warming** because
 - it already experiences **high temperatures** and **low (and highly variable) precipitation**.
 - the economies are highly **dependent on agriculture**, and
 - **adoption of modern technology is low (Lack of institutional support)**.
- The analysis explores three principal findings:
 1. African net farm revenues are sensitive to climate.
 2. Irrigated and dryland crops have different responses to climate.
 3. Crops and livestock have different responses to climate.

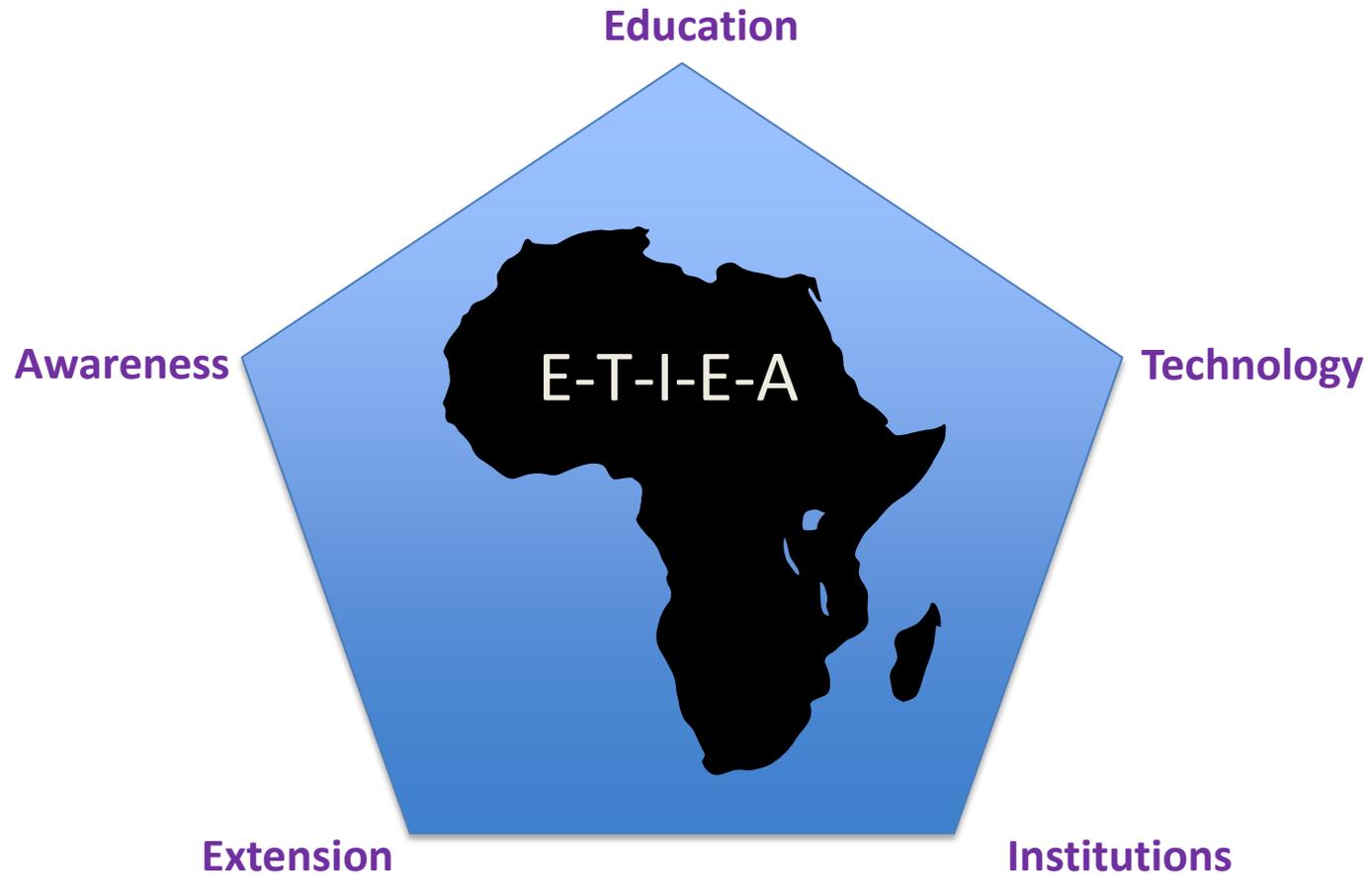
Results (2)

Maddison 2007 (Using the same data as Kurukulasurya et al.)

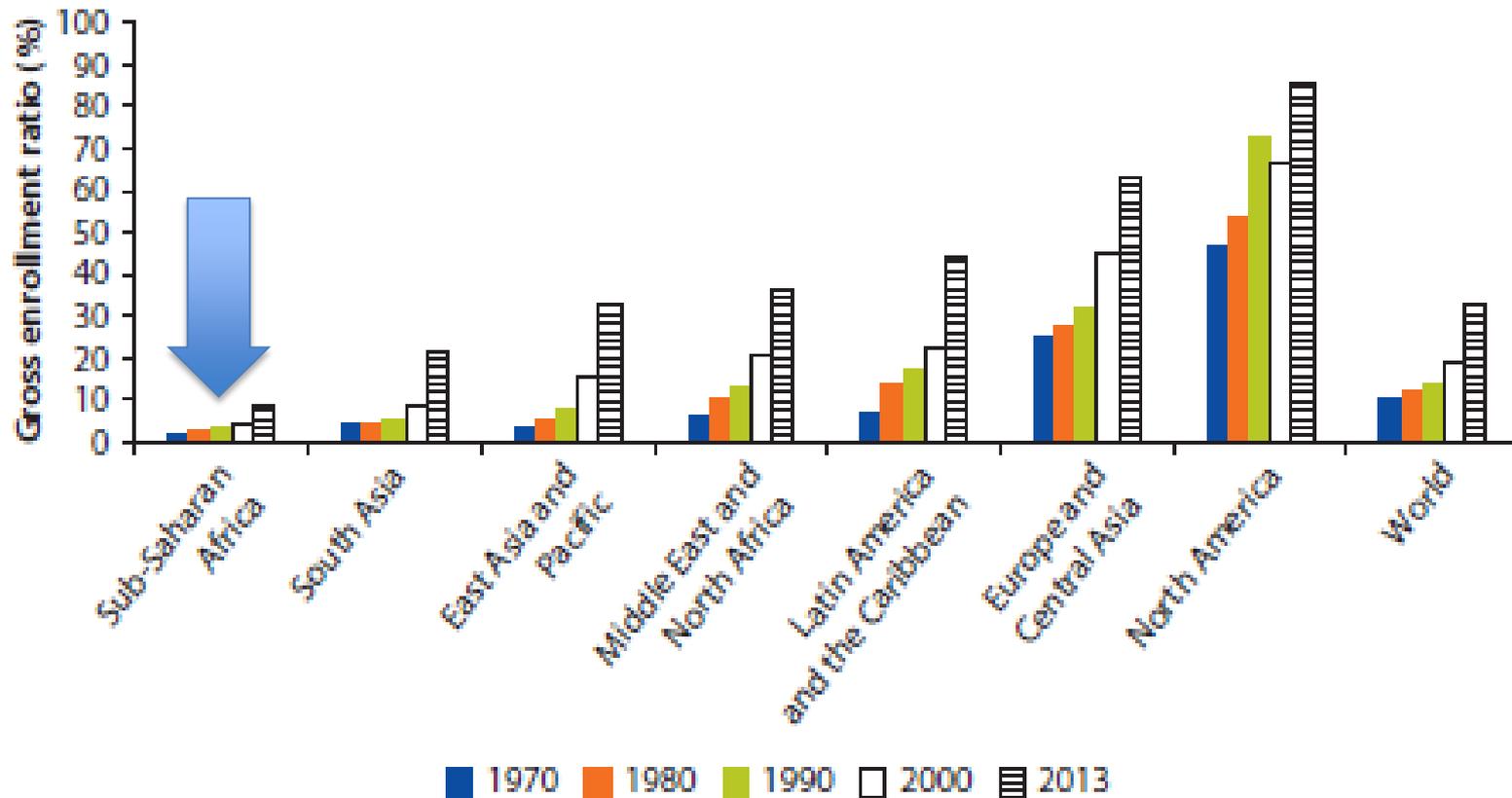
- Farmers perception of barriers to adaptation
- Determining the characteristics of those farmers who identify CC, respond to CC, and ignore CC.
 - Farmers believe that temperatures have already increased and that precipitation has declined.
 - Farmers with the greatest experience of farming are more likely to notice CC.
 - Educated farmers are more likely to respond to CC by making at least one adaptation.
 - There are important differences in the propensity of farmers living in different locations to adapt
 - There may be institutional impediments to adaptation in some countries.
 - Farmers that do perceive barriers to adaptation tend to cite their poverty and inability to borrow.



What could be a course of action? Also the focus of this Forum

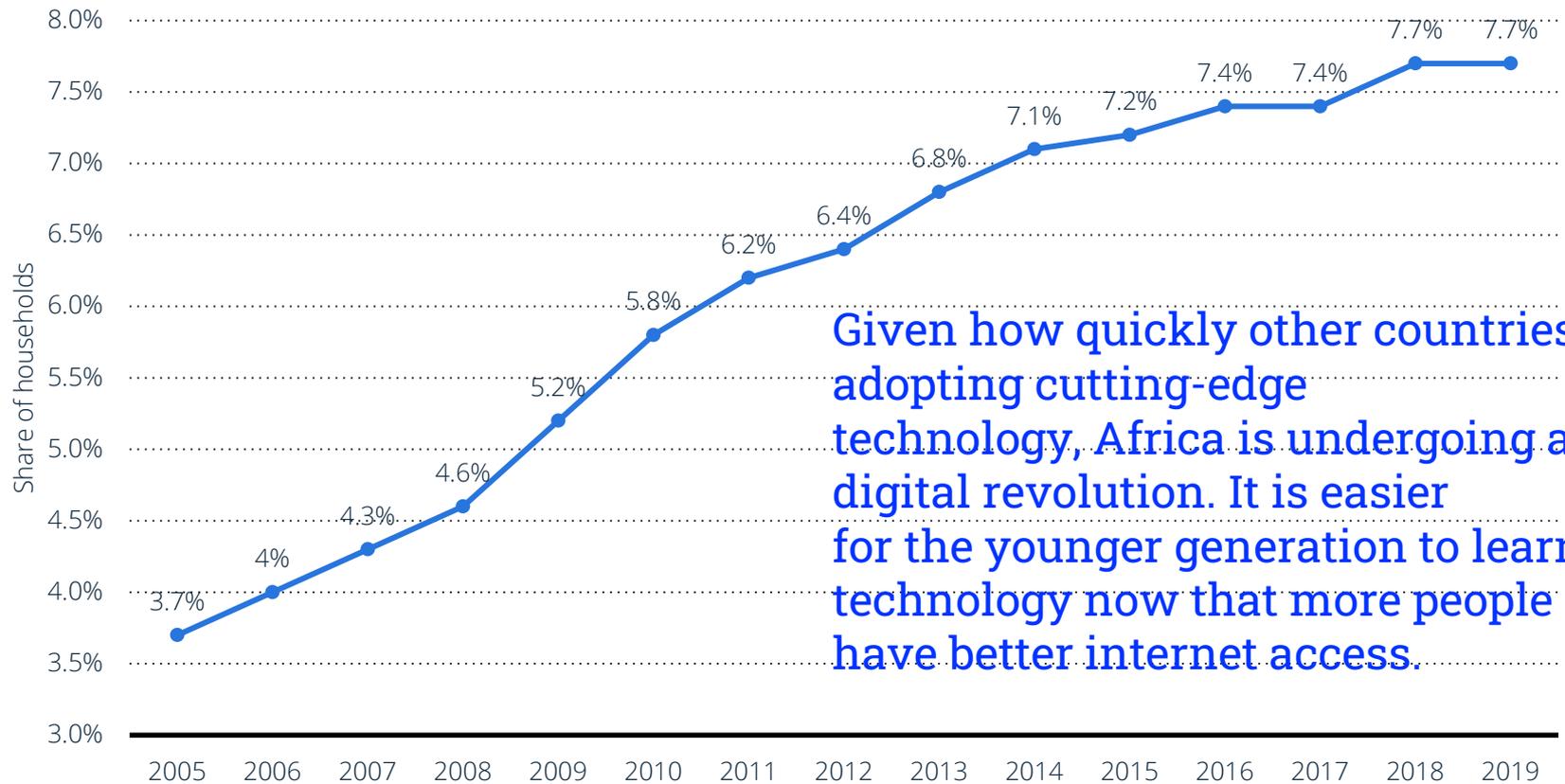


Higher Education Gross Enrollment by Region



Source: Calculations are based on UIS data.

Technology: Share of households in Africa with a computer at home, 2005 to 2019



Given how quickly other countries are adopting cutting-edge technology, Africa is undergoing a digital revolution. It is easier for the younger generation to learn technology now that more people have better internet access.

Note(s): Africa; 2005 to 2019

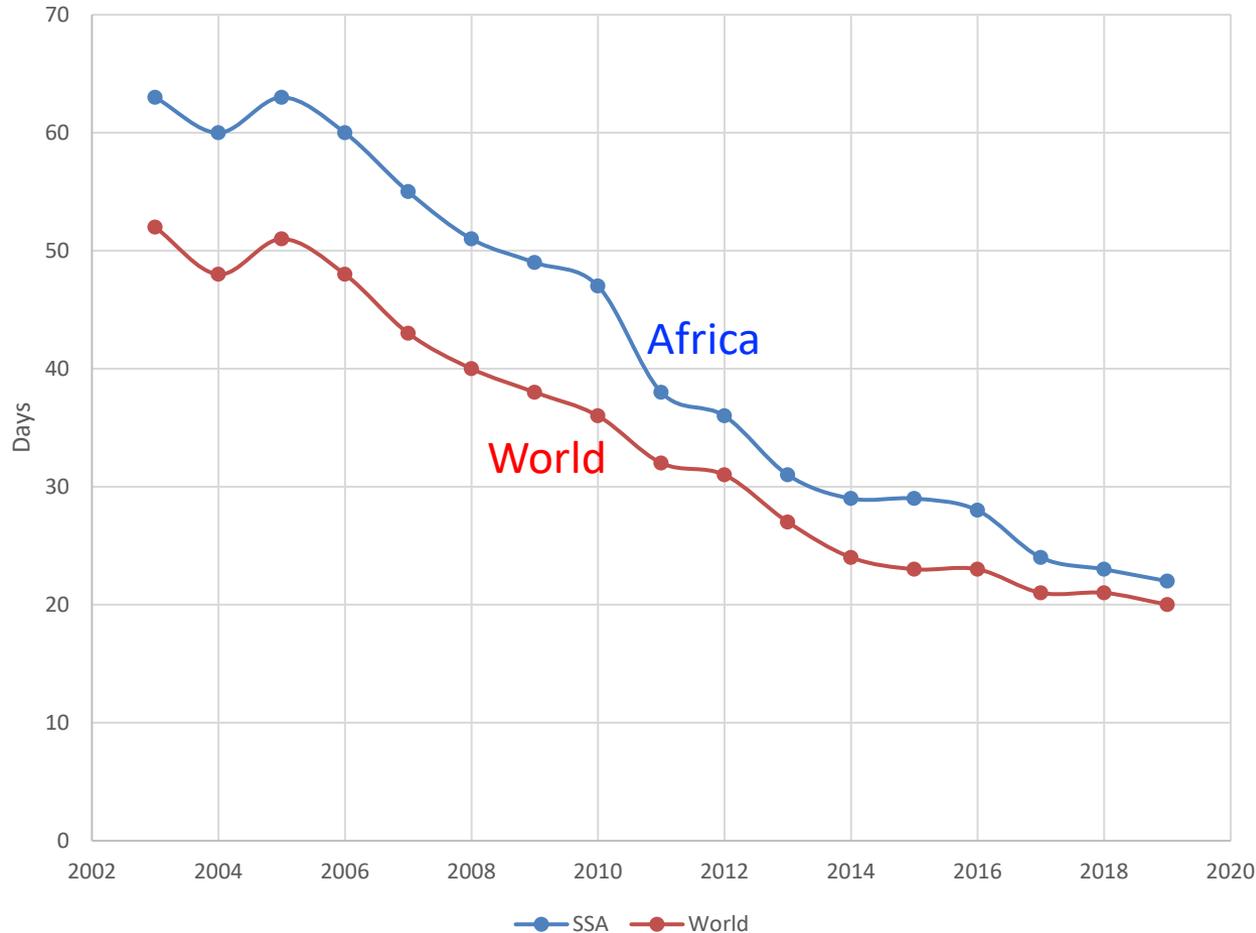
Further information regarding this statistic can be found on [page 8](#).

Source(s): ITU; [ID_748549](#)

Source: **statista** 

Institutions

Time required to start a business (days)



Sub-Saharan Africa <https://data.worldbank.org/indicator/IC.REG.DURS?locations=ZG>

World <https://data.worldbank.org/indicator/IC.REG.DURS>

Agricultural Extension (information and knowhow)



Generation Awareness



FLID –A new Concept in Africa



The FLID (FARMER-LED IRRIGATION DEVELOPMENT) initiative at the World Bank

- challenges of feeding a growing population,
- improving nutrition,
- adapting to the impacts of climate change, and
- reducing global poverty.

MAURITANIA
NIGERIA
ETHIOPIA
SOMALIA
UGANDA RWANDA
DRC
KENYA
ANGOLA
ZAMBIA
TANZANIA
MALAWI
COMOROS
SOUTH AFRICA
ZIMBABWE
MADAGASCAR

In 15/40 countries:
From
Diagnostic
To
Operational

FLID is the process where farmers, alone or as a collective, take the lead in the establishment, improvement, or expansion of irrigated agriculture.