Transforming Agriculture and Food Systems in Africa

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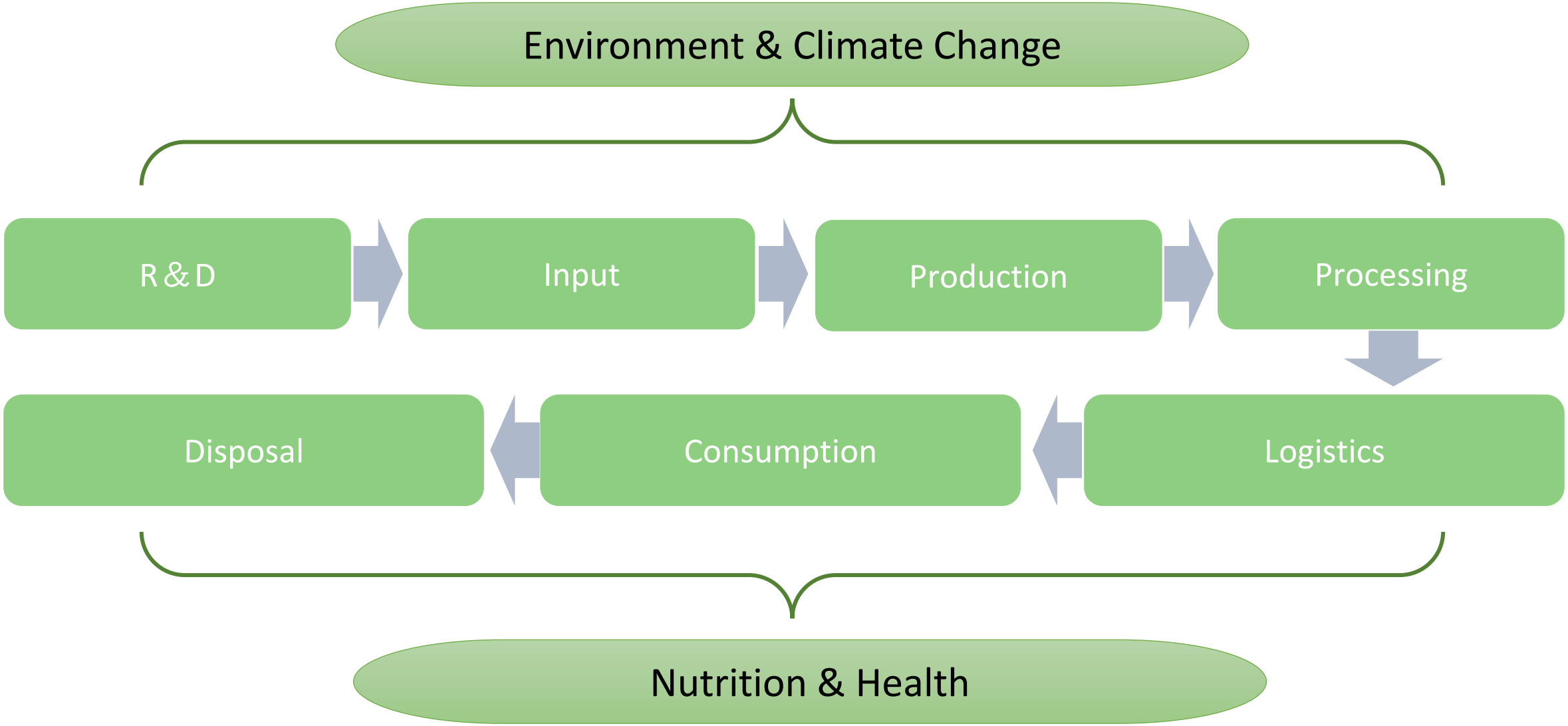
Outline

1. **Challenges Facing Africa's Agrifood Systems**
2. Pathways for Transforming Agrifood System in Africa
3. China-Africa Cooperation for Agrifood System Transformation

Food Systems in Afirca



Poverty and Hunger in Africa

Poverty remains prevalent in Africa

- In 2022, around **460 million people** on the continent were living **below the extreme poverty line of $1.90 a day**
  - **Nigeria:** accounted **12%** of global extreme poverty
  - **The Democratic Republic of the Congo:** accounted **11%** of global extreme poverty
- Throughout Africa, **rural households face higher poverty levels**. In 2022, the extreme poverty rate among Africa's rural and population
  - **Rural: 50%; Urban: 10%**
- The number of inhabitants living below the extreme poverty line is expected to decrease to **411 million** by 2027. However, Africa to remain the **poorest** region globally.

(Data source: Global Sustainable Development Report 2023)

Hunger is still on the rise in Africa

- **The proportion of the population facing hunger(2022)**
  World: 9.2%; ***Africa***: 19.7%
- **Children under 5 y/o stunted(2022)**
  World: 148 million(22.3%); ***Africa***: 63.1 million(30%)
- Sub-Saharan Africa, particularly West, East, and Middle regions, is experiencing a significant rise in hunger

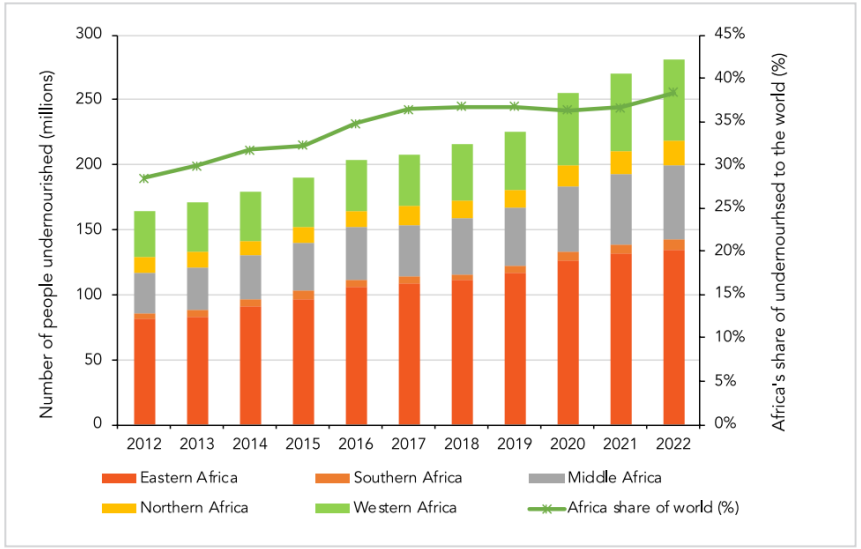
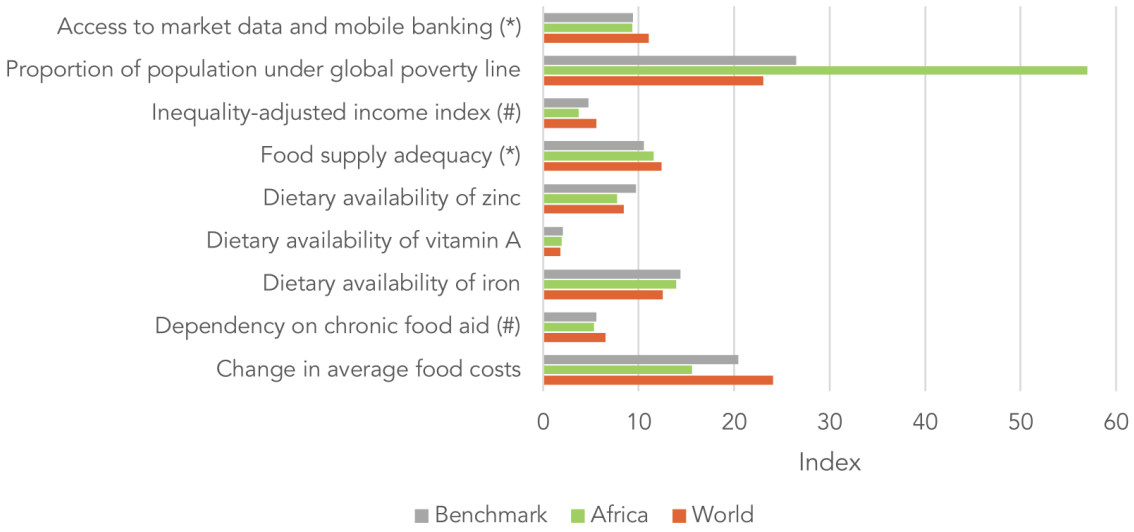


Figure 3.2: Prevalence of undernourishment in Africa (2012-2022)
Source: FAO (2023)

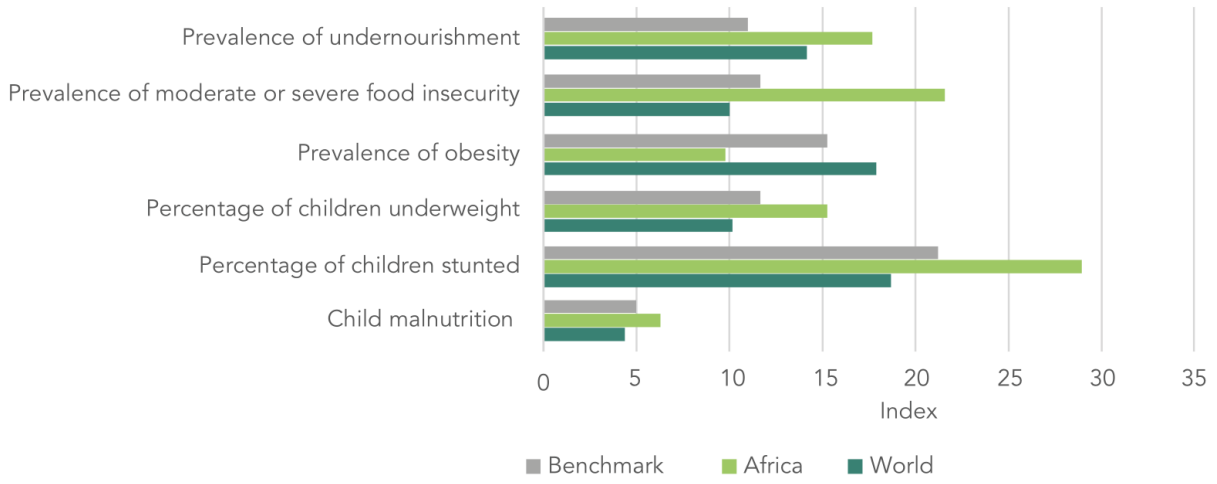
Challenges in Food Accessibility

- Africa is **failing on economic availability to sufficient food**
  - ✓ Too many people under the poverty
  - ✓ Income inequality is high
  - ✓ Access to market data and mobile banking is still a challenge

- Except for prevalence of obesity, all other indicators are above the world average
  - ✓ ***Undernourishment***
  - ✓ ***Moderate or severe food insecurity***
  - ✓ ***Children underweight***
  - ✓ ***Children stunted***
  - ✓ ***Children malnutrition***
- **Micronutrients Deficiency** such as zinc, vitamin A, and iron is higher than the world average



Food availability



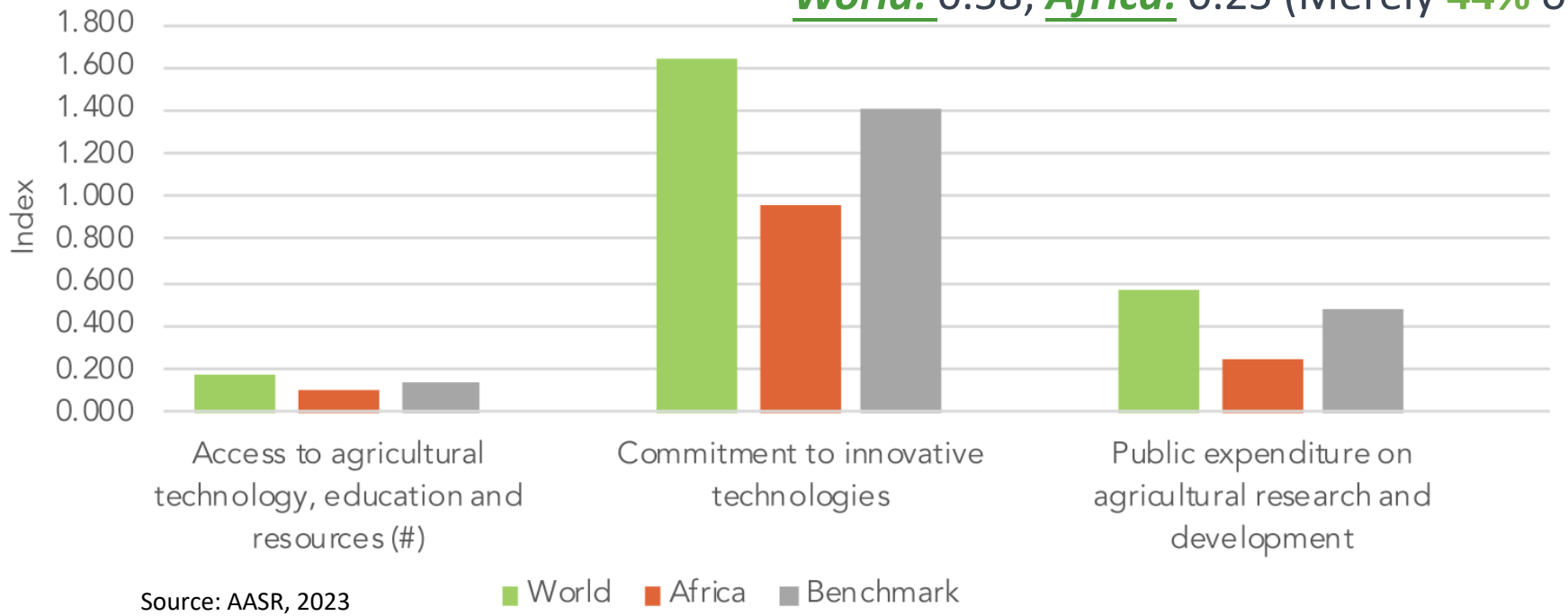
Source: AASR, 2023

Food utilization

Low Investment in Agricultural R&D

- R&D plays a crucial role in
  - ✓ Improving productivity
  - ✓ Enhancing food security
  - ✓ Promoting sustainable agricultural practices

- Yet, Africa's agricultural R&D lags behind
  - ✓ **Access** to agricultural technology, education, and resources:
    - ***World***: 0.18; ***Africa***: 0.12 (Only at **64%** of the global average)
  - ✓ Commitment to innovative **technologies**:
    - ***World***: 1.65; ***Africa***: 0.97 (Only at **58.9%** of the global average)
  - ✓ **Public expenditure** on agricultural research and development:
    - ***World:*** 0.58; ***Africa:*** 0.25 (Merely **44%** of the world average)



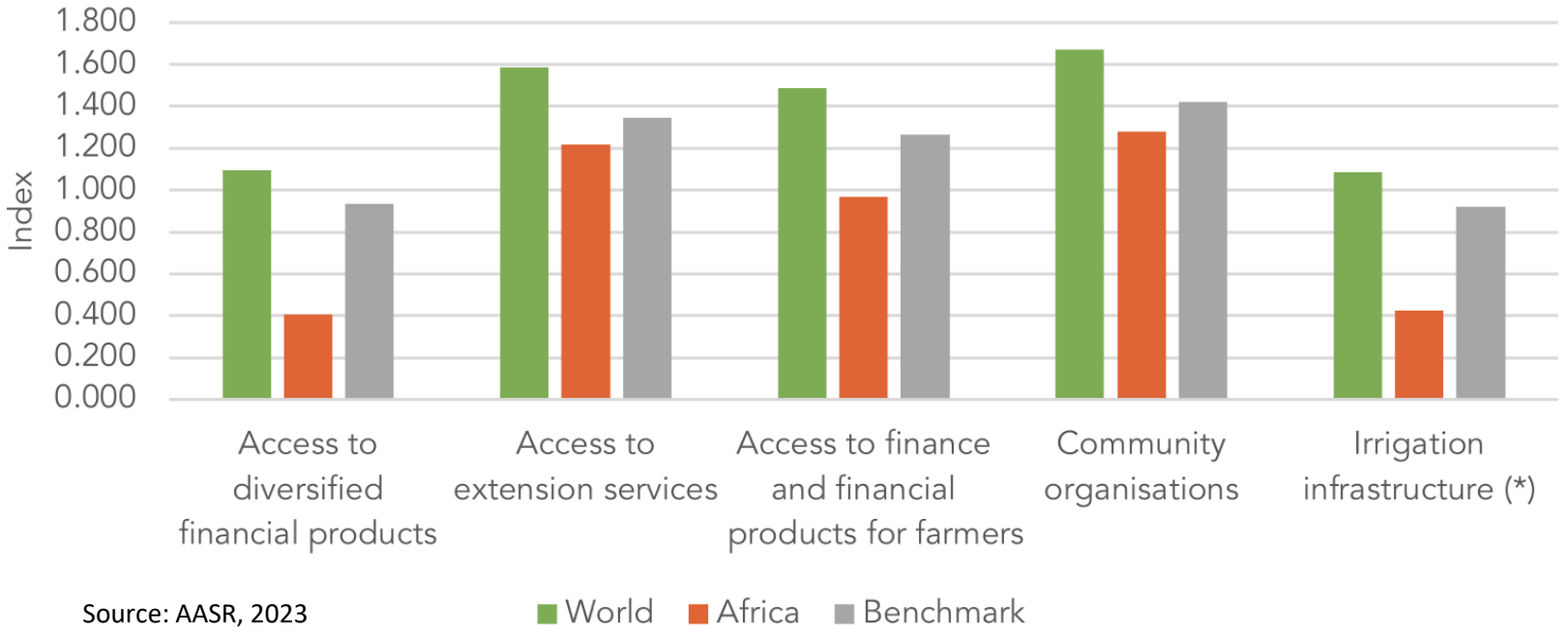
Source: AASR, 2023

Agricultural research and development in Africa

Lack of Access to Inputs & Services

- Lack of access to agricultural inputs and services
  - Reducing productivity
  - Increasing vulnerability to risks
  - Promoting unsustainable practices
  - Limiting market access
  - Inhibiting innovation and adaptation

- Africa's access to key elements
  - **Diversified financial products**: ***World***:1.09; ***Africa***:0.40 **(37%)**
  - **Irrigation infrastructure**: ***World***:1.07; ***Africa***:0.42 **(39%)**
  - Finance and financial products for farmers: ***World***:1.48; ***Africa***:0.962 **(65%)**
  - Extension services: ***World***:1.58; ***Africa***:1.21 **(76.81%)**
  - Community organizations: ***World***:1.67; ***Africa***:1.27 **(76%)**



Source: AASR, 2023

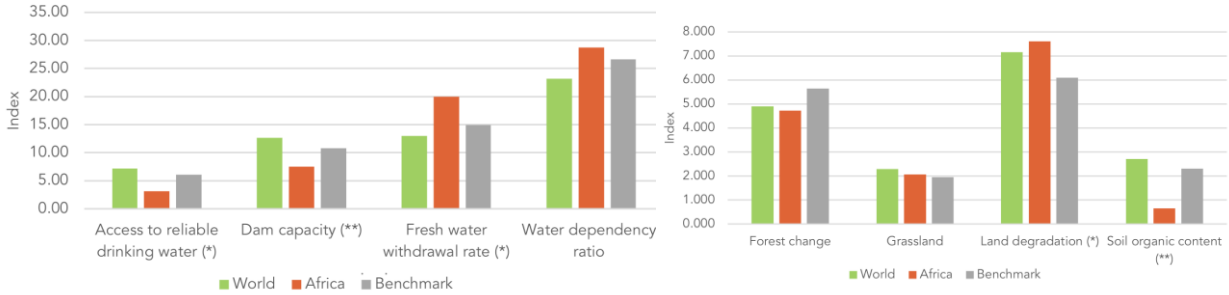
Agricultural inputs and services in Africa

Limited Natural Resources and Low Productivity

☐ Limited Natural Resources

- ➢ ***Water Challenges***
  - Limited access to reliable drinking water
  - Low dam capacity
- ➢ ***Land and soil degradation***
  - High land degradation
  - Soil organic content:

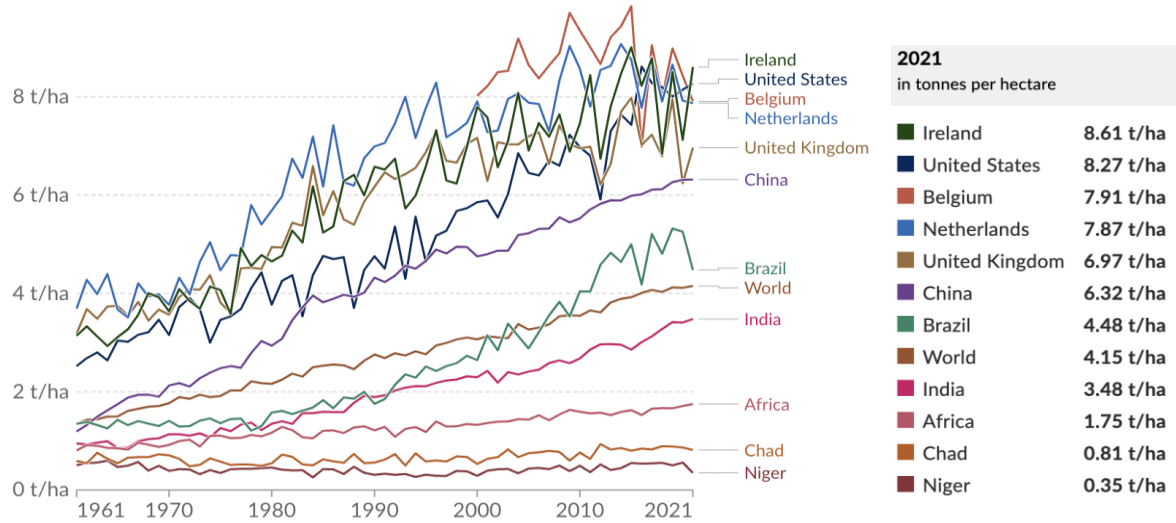
    World:2.87; ***Africa***:0.66 **(23%)**



Source: AASR, 2023

☐ Africa's agricultural yields have consistently lagged behind global averages, with the gap widening over time

- ➢ ***In 2021, Africa's average yield is***
  - Only half of India’s
  - Just 27% of China’s
  - Mere 1/5 of yields seen in the US



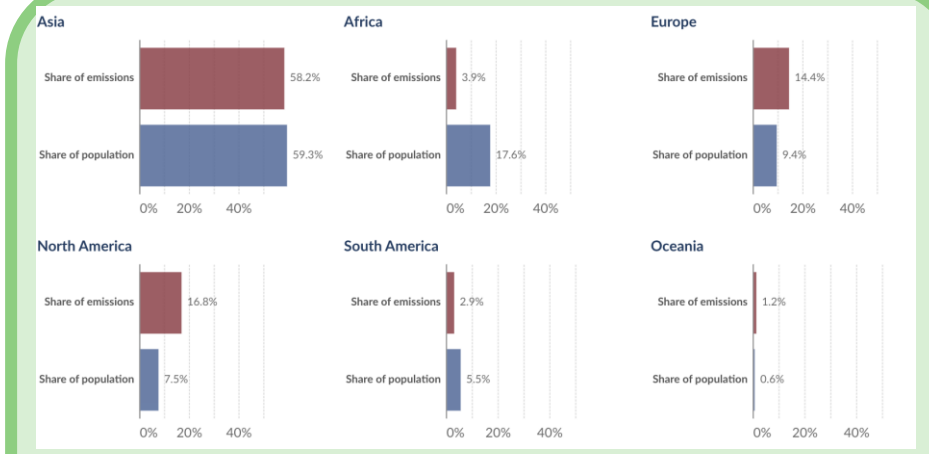
Note: Cereals include wheat, rice, maize, barley, oats, rye, millet, sorghum, buckwheat, and mixed grains

Data source: FAO

Cereal yield, 1961 to 2021

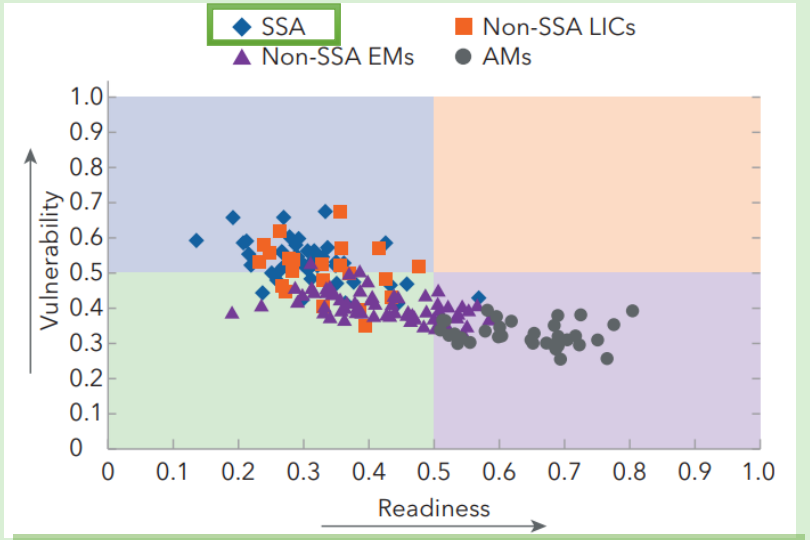
Vulnerability to Climate Change

- Africa only contributed roughly **4%** to greenhouse gas emissions worldwide
- Yet, African nations rank among the **most vulnerable** to the impacts of climate change
  - ✓ **Climate events** are **disproportionately** common in the region
    - **1/3** of the world's **droughts** occur in **sub-Saharan Africa**
  - ✓ Africa relies heavily **on rain-fed agriculture**
  - ✓ Africa has **limited resilience and coping mechanisms**
  - ✓ With each **flood** or **drought**, **food security** declines by 5-20% in Africa



Data source: Global Carbon Budget (2023) and Our World in Data

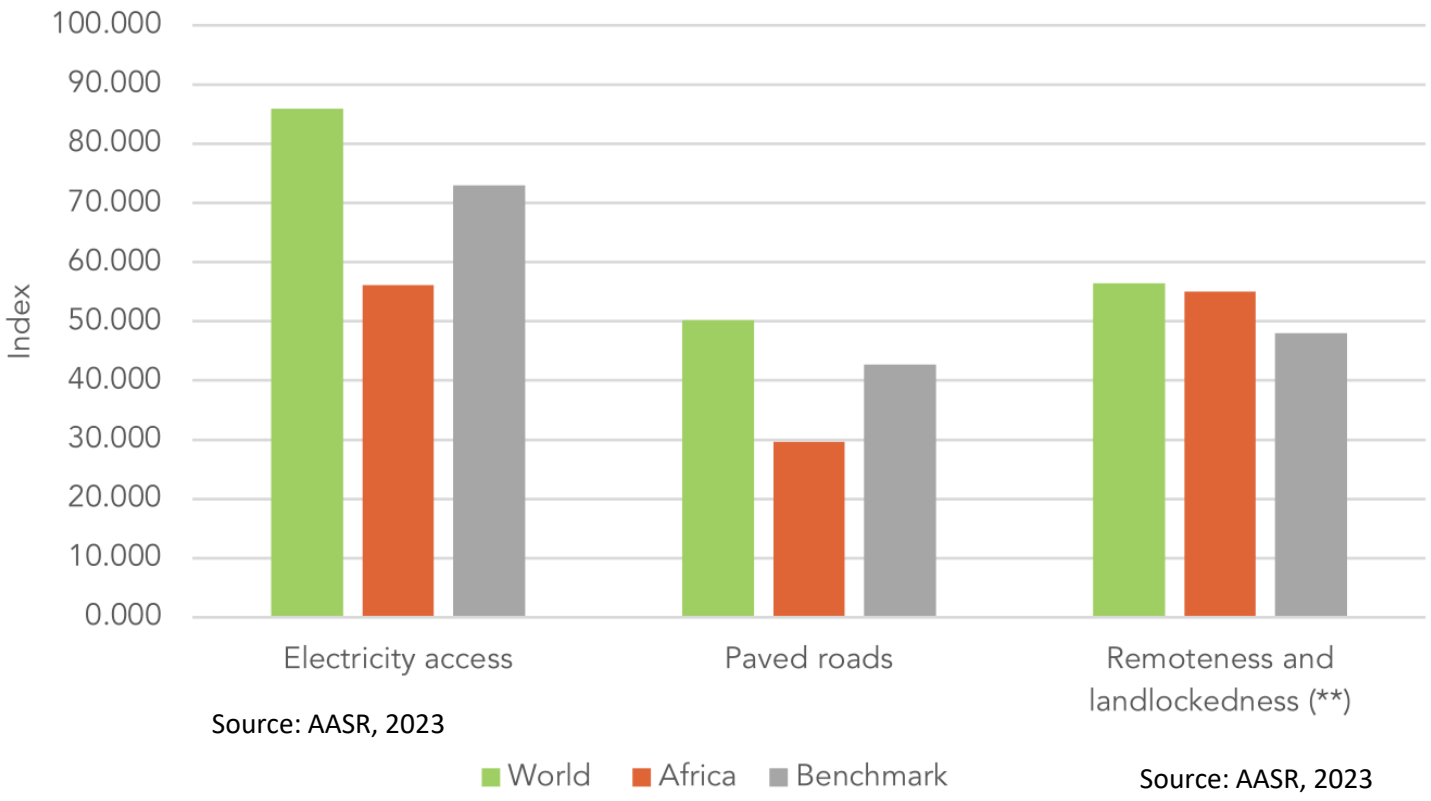
Share of global CO_2 emissions and population, 2021



Resilience to climate change: world indicies, 2020

Source: IMF Departmental Papers, 2022

Obstacles in Processing and Logistics



Source: AASR, 2023

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Energy and roads in Africa

- **Energy** is needed for food storage, including maintaining a cold chain for perishable goods, without which high post- harvest losses can occur (Kitinoja et al., 2011)
- **Poor road infrastructure** can limit **farmers**' ability to get their produce to markets
- Poor roads often make it more difficult for **consumers**
  - ✓ Increase the cost of transportation, which can lead to higher food prices

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Intensification Must be Sustainable

- **Rapid population growth is driving an unprecedented demand for food**
  - Historical Growth:
    1990: 140million →2010: more than 1billion
  - Future Projections:
    2050: 2.5billion; 2100: more than 4 billion
- **African agricultural growth has historically been driven by the expansion of cultivated land rather than productivity gains, leading to widespread land degradation and soil nutrient depletion**

Table 1 Land, labor and total factor productivity

Region	Land productivity/USD				Labor productivity/USD				Total factor productivity growth/%		
	1990	2000	2010	2015	1990	2000	2010	2015	1991–2000	2001–2010	2011–2015
Sub-Saharan Africa	190	239	319	335	1084	1438	1887	2078	1.5	1.0	0.4
Latin America and the Caribbean	255	336	468	526	5710	7903	12404	15447	1.3	2.3	1.9
Asia and the Pacific	646	909	1219	1355	803	1104	1738	2298	1.7	1.7	1.5
Middle East and North Africa	1073	1344	1596	1738	2565	3491	4484	5240	1.3	1.5	1.2

Note: Source from IFPRI 2020 Global Food Policy Report[5].

- **Africa must use limited resources to produce more and better food for increasingly richer and urbanized population through a sustainable intensification strategy of agriculture**

Emphasis: Balance between sustainability and intensification

Definition: Producing nutrient-rich foods with minimal natural resources and carbon emissions(Fan, 2020)

To achieve this vision, innovations in technologies, policies and institutions are essential.

Promoting Innovations in Technology

- Technologies should focus not only on increasing yield and productivity, but also on achieving multiple benefits, including climate adaptation, greenhouse gas mitigation, and nutrition.

Yield-enhancing technologies

-High-Yielding Crops
-Remote sensing
-Precision agriculture
-No-tillage
-Solar-powered irrigation

Climate adaptation technologies

-Climate smart crops
-Climate Smart Livestock Production
-Climate Information Services

Nutrition technologies

–Biofortification through transgenic techniques and agronomic practices

New and potentially transformative technologies

-Gene editing
-Big data and analytics
-Blockchain
-Digitalization

Promoting Innovations in Policy

- **Tailored policies and programs are needed for populations uniquely impacted by current trends in food security and nutrition, namely smallholders and the urban poor.**
  - **Policies** can promote land rights and efficient land markets (including new arrangements in land rental markets), and improve risk-management, mitigation and adaptation strategies through insurance and information services.
  - **Social protection systems** can build on successes, to provide both safety nets and agricultural support to help secure basic livelihoods while building resilience to shocks.
  - **Measures** to increase the access of the urban poor to healthy and nutritious foods and to promote healthy choices will be important.

Lessons can be learned from China

China's agricultural and economic success was driven by **agriculture-led reforms and rural development**

Smallholder-led agriculture growth in land scarce countries often have the largest impact on poverty reduction.

Nonfarm employment and rural-urban migration must follow once agricultural productivity has reached a certain level.

Social safety nets must be established to cover those who have not benefited from growth and development.

Promoting Innovations in Institutions

The Role of Institutions

Encourage inclusive value chains

- Support the quiet revolution taking place in traditional value chains
- Expansion and modernization of farms, mills and markets in the Asian rice value chain

Enhance vertical and horizontal coordination

- Promote efficiency-building competition among different farming models such as cooperatives and family farms
- Improve farm-to-market synchronization

Urban-Rural policy cooperation

- Support the flow of products into cities and also to fully harness the opportunities available from growing urbanization
- Integrate smallholders, traders, and others into the urban markets along the full food value chain

Encourage climate-smart agriculture adoption

- Facilitate access to many resources and to information for stakeholders
- Provide insurance and adapt products for smallholders
- Provide support through social safety nets
- Encourage partnerships for climate-smart adaptation
- Support climate-friendly financial arrangements

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Enhancing China-Africa Cooperation

- **China and Africa face similar challenges on food security and climate change**
  - ✓ *Climate Change*
  - ✓ *Natural Resources Degradation*
  - ✓ *Biodiversity Loss*
  - ✓ *Human Conflict*

China is the largest developing country in the world, and Africa is the continent with the largest number of developing countries. Shared past experiences and similar aims and goals have brought China and Africa close together.

- **Pathways for mutual agrifood system transformation through China-Africa Cooperation**

Strengthen science and technology cooperation

Enhance investments in agrifood system

Strengthen China-Africa bilateral trade

Establish China-Africa agrifood policy network

Strengthening Science and Technology Cooperation

Photo: ICARDA

Cooperation in Providing Climate Information Services

- Climate Information Services (CIS) has been used to anticipate and manage risks and build climate resilience of smallholder farmers
- ***ETRSS - 1***, the first satellite of Ethiopia, was launched under the cooperation between Ethiopia and China
- In Ethiopia, an international CIS program helped 87 ag-extension, 58 health-development agents, and **46,120 smallholder farmers** and livestock keepers access seasonal climate/weather forecasts and agro-climate advisories for the short and long rainy seasons

Cooperation in Promoting Climate Smart Agriculture

- Under China-FAO projects on South-South cooperation, a Chinese team increased grazing production in Madagascar by **10 times**; another team helped farmers in Uganda build ammoniation pools to process forage for thousands of animals
- With global cooperation, 16 universities contributing 706,108 USD to develop and scale up a climate smart livestock solution: *CSA small ruminant SmaRT-packs*, benefiting over **48,000 farmers** in Africa

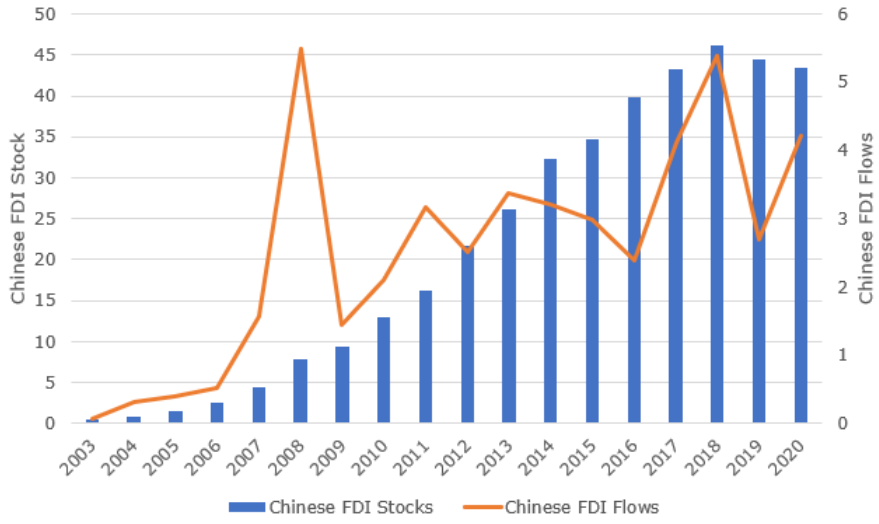
Cooperation in Managing Natural Resources

- With the cooperation between Burkina Faso and China, a new solar power station will meet the electricity needs of over **20,000 local households**
- With global cooperation, more than **37,712 farmers** have participated in a rehabilitation scaling project and are rehabilitating over 5,900 ha of degraded agricultural landscapes in Africa

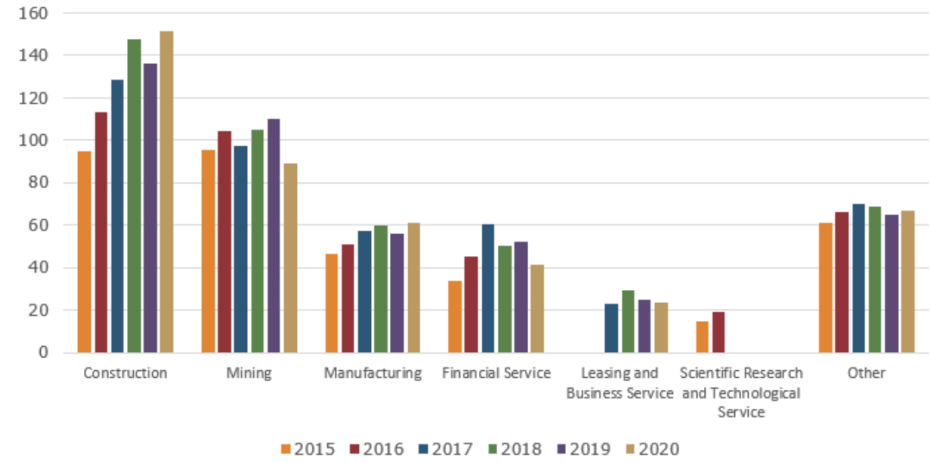
Enhancing Chinese Investments in Agrifood System

- Since 2003, annual **flows of Chinese foreign direct investment to Africa** has risen significantly
  - ✓ From a mere $74.8 million in 2003 to $4.2 billion in 2020
- Over the same period, **Chinese FDI stocks in Africa** grew nearly 100-fold over a 17-year period
  - ✓ From $490 million in 2003 to $43.4 billion in 2020, peaking in 2018 at $46.1 billion
- Since 2014, **China became Africa's fourth largest investor**, ahead of the United States
- The investment has been concentrated in construction, mining. Thus, investments for food systems transformation are supposed to be enhanced.

Chinese FDI Stock in and Flows to Africa (in billion USD)



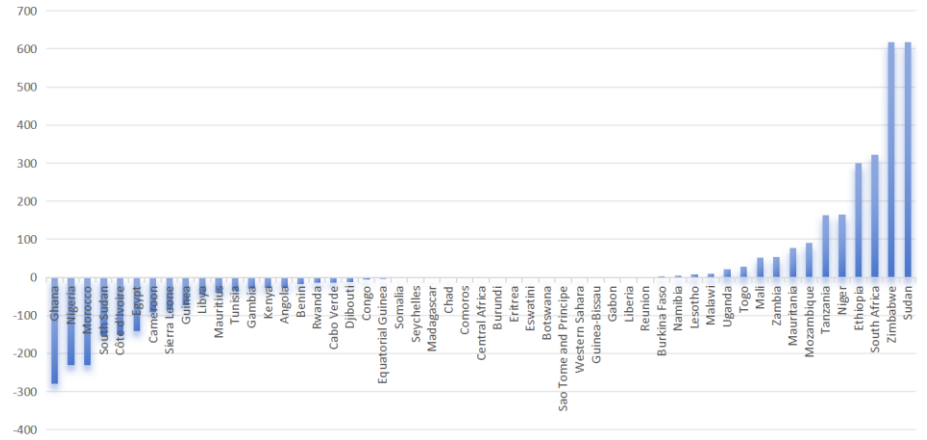
Top 5 Industries for Chinese FDI Stock in Africa, 2015-2020 (in 100 million USD)



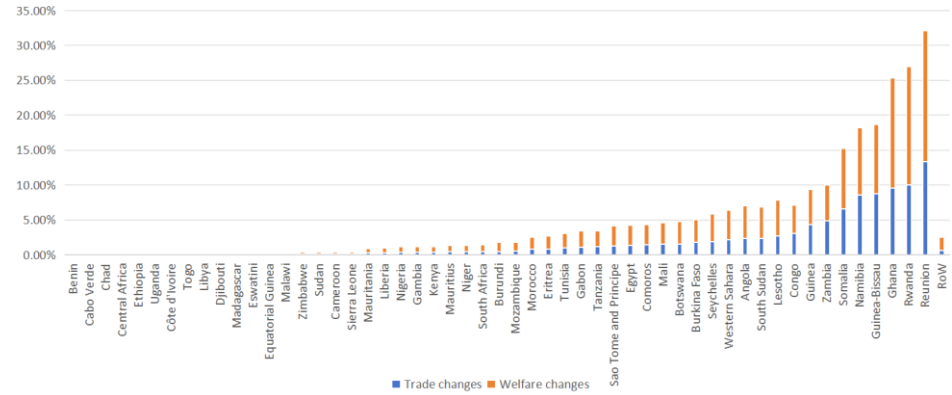
Data Source: the Statistical Bulletin of China's Outward Foreign Direct Investment

Strengthening China-Africa Bilateral Trade

- **Strengthening China-Africa food trade cooperation can help African countries balance their trade deficits and enable China to import diverse food from Africa**
  - Current food trade between China and Africa
    - 16 African countries have a trade surplus in agricultural products with China
    - 33 African countries have a trade deficit
  - Based on the structural quantification model forecast, after simulating the signing of a China-Africa Free Trade Agreement
    - Expected overall food trade growth of Africa: ↑ from 0.01% to 13.4%



China - Africa Agricultural Products Bilateral Trade Volume (in Million USD)



Simulated Effects on Trade and Welfare in African Countries After Signing a China-Africa Free Trade Agreement

Establishing China-Africa Food Policy Network

Establish high-level **dialogue mechanism** between China and Africa for promoting concerted action to build resilient food systems

Establish **academic collaborations** between China and Africa

- Case studies
- Surveys and Investigations
- Publications
- Policy

Establish **working groups** to exchange and cooperate on key policy issues on food and nutrition security, climate adaptation and mitigation, and poverty reduction

Academy of Global Food Economics and Policy