Challenge to tackle to Climate Change in Sub-Saharan Africa

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Japan International Cooperation Agency (JICA)

Africa Department

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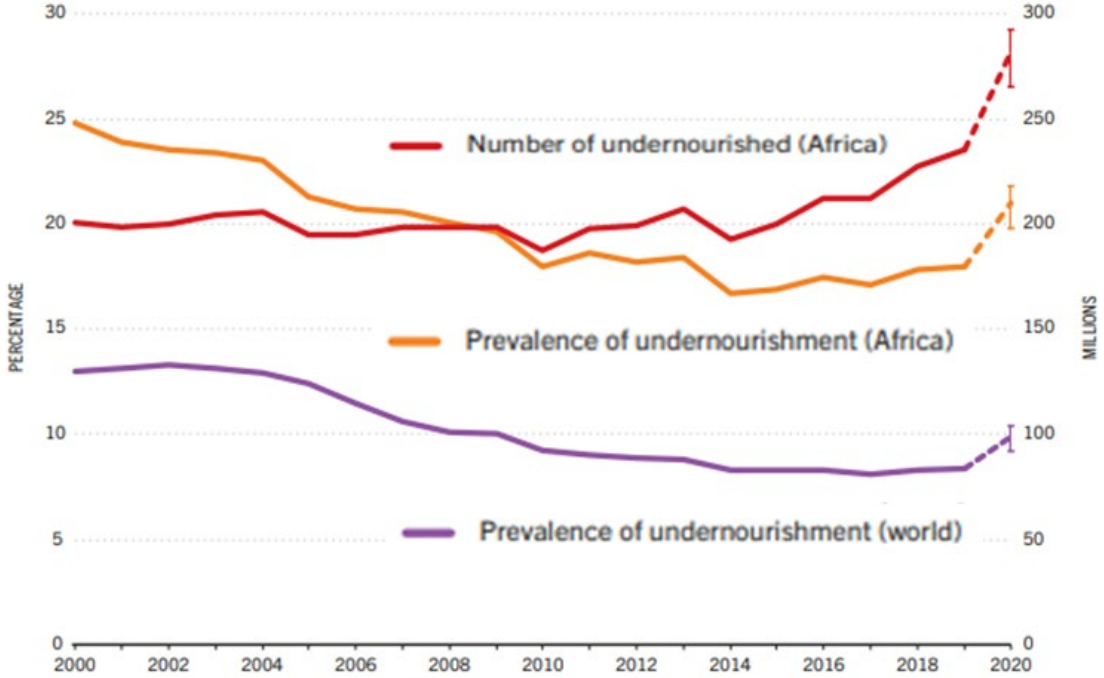
Note: The views expressed in this paper are those of the author and do not necessarily represent the official positions of JICA.

Expected Role of Agriculture in Sub-Saharan Africa

Achieve Food Security

- *Hunger in Africa has worsened since 2014. (FAO,2021).*



- *Countries in East and southern Africa continue to experience acute food insecurity that is predicted to increase further in the coming months (WB, September 2022)*

Drive Economic Development

- Agriculture is major value-adding and employing sector. (WB)

Region / Country	GDP share	Employment
Sub-Saharan Africa	17.7% (2021)	53% (2019)
Sierra Leone	59.5% (2020)	54% (2019)
Chad	54.0% (2020)	75% (2019)
Ethiopia	37.6% (2021)	67% (2019)
World	4.3% (2021)	27% (2019)

- Agriculture is expected to drive economic development in national policies.

✓ *Kenya Vision 2030 … The economic pillar recognizes agriculture as a critical sector in contributing … achieving an average GDP growth rate of 10 % per year (Kenya, Agricultural Policy, 2021)*

✓ *Agriculture is a central driver for transformation toward a knowledge based, middle-income economy (Rwanda, National Agricultural Policy, 2018)*

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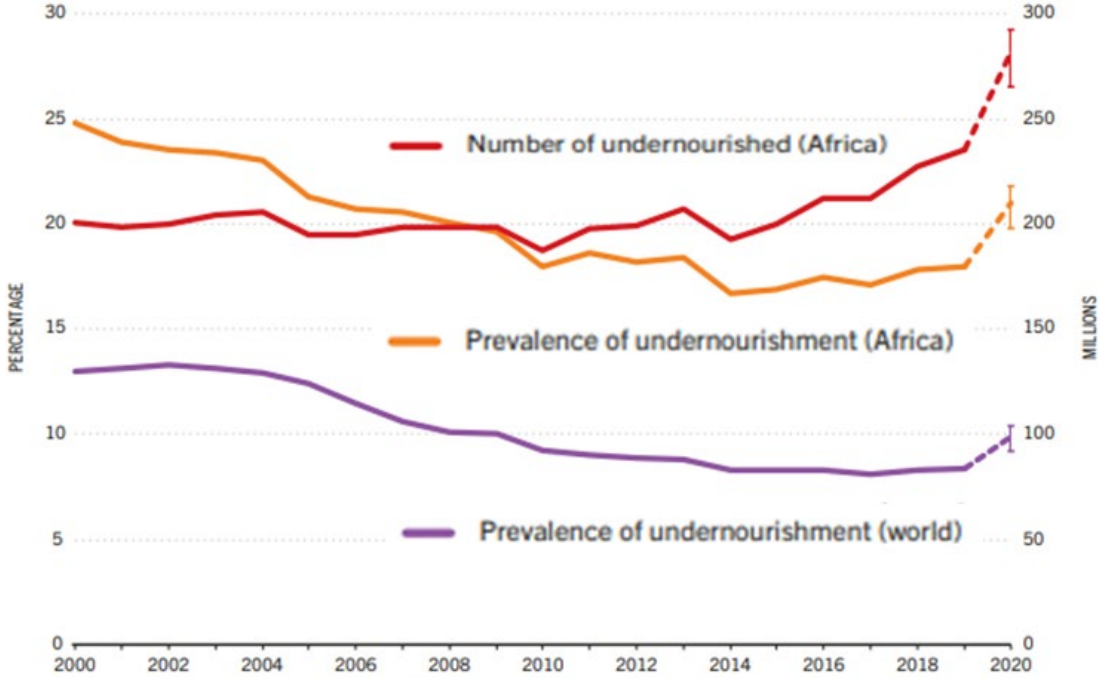

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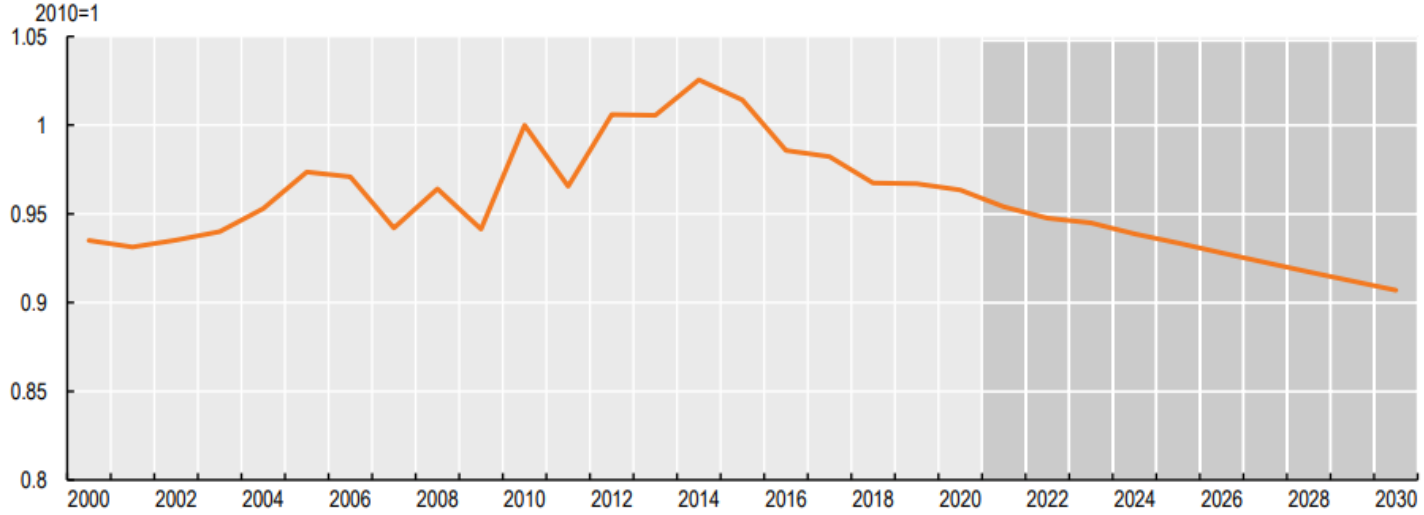
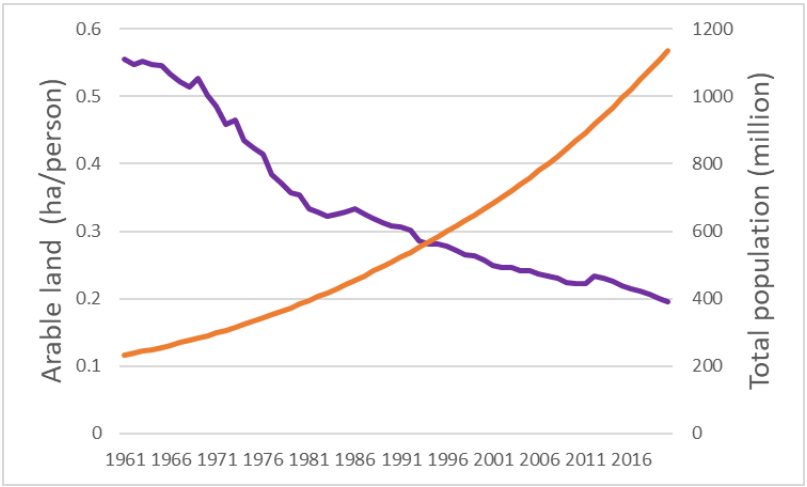
Tackling Climate Change Cannot Ignore Improvement of Agricultural Production.

From the Perspective of Farmers in Sub-Saharan Africa

Net Value of Agriculture per Person is Decreasing. (FAO)





In the background,

- ✓ Arable land per person is decreasing, while population growth rapidly. (WB)
- ✓ *…the ongoing expansion of agricultural land use is constrained by various sources of uncertainty, including land fragmentation trends, conflict in land abundant countries, and the presence of other competing uses such as mining and urban sprawl… (FAO, 2021)*

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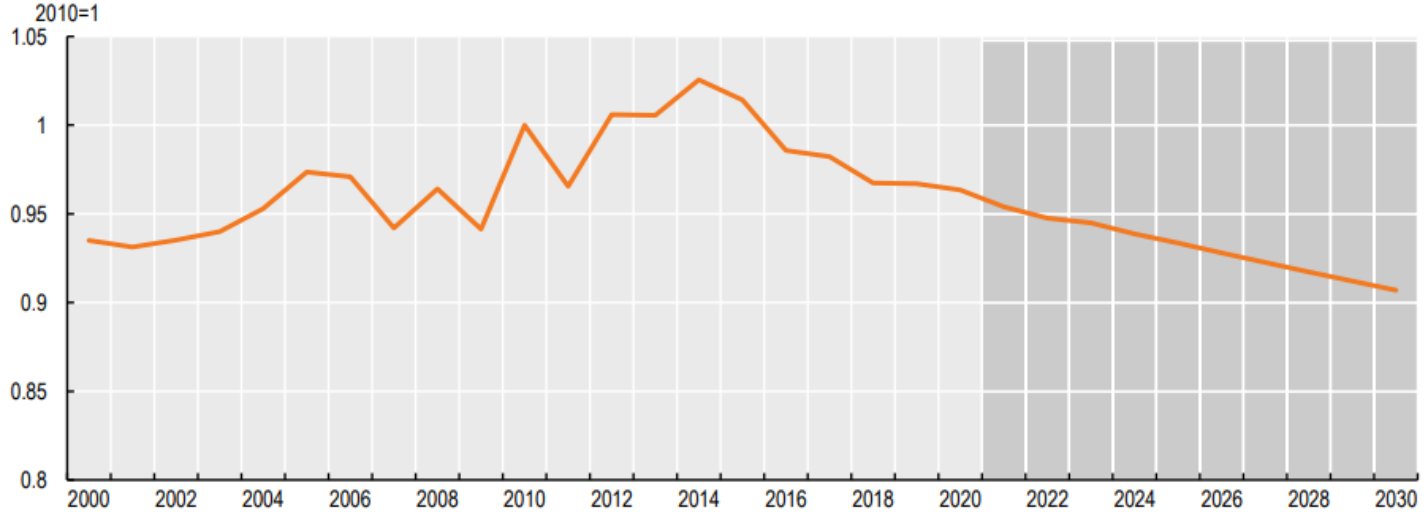

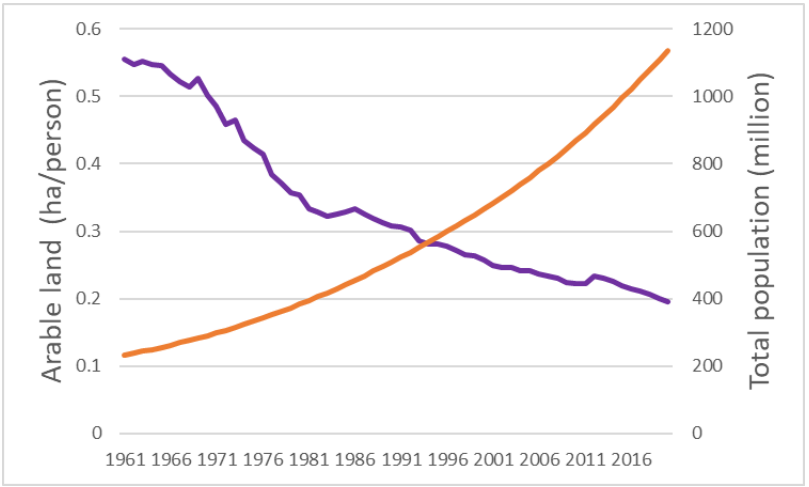

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Farmers Cannot Afford Only to Climate Change.
They Need Their Own Benefit, Ex. Profit, Productivity.

What JICA Do | Case of Zambia (Adaptation)

Development of Community-Based Smallholder Irrigation

- Utilize small rivers or wetlands as water sources
- Develop small-scale irrigation facilities by farmers themselves
- ✓ Utilize materials which is easy for farmers to get, like tree branches
- ✓ Assume to be broken in rainy reason
- ✓ But farmers themselves can make new ones
- After controlling water well, construct permanent weirs by farmers themselves.

Construction of small-scale irrigation facilities by farmers

Irrigation Areas Have been Expanded by Farmers Themselves

- In 2009-2011, 544ha were newly irrigated, with 6,874 beneficiary farmers
- They get additional 1,550ZMW (+33%) by irrigation development
- In 2013-2017, 961ha were newly irrigated, income increasing to 220%
- From 2019, disseminating this technology wider and wider

Construction of permanent weirs by farmers, by stonework

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With Their Own Benefit (Production, Water Supply), Farmers Adopt New Technology by Themselves.

What JICA Do | Case of Kenya (Adaptation and Mitigation)

Development of Water Saving Rice Cultivation (WSRC)

- The WSRC is a technical package that aims at yield improvement and water saving, which consists of intermittent irrigation, healthy seedling etc

Paddy field where WSRC was adopted

WSRC Can Save Water and Improve Production at the Same Time.

- WSRC was developed in Mwea irrigation scheme, which was constructed with JICA loan
- One of major issues here is lack of water in dry season
- Recent demonstration experiments in some areas shows yield can be increased by 2 tons/ha with WSRC, need further experiments
- Farmers start to adopt WSRC, but need more demonstration to understand the effect

Measure production in paddy riled where WSRC was adopted

WSRC Can Also Reduce CH4, But as a Side Effect for Farmers

- Intermittent irrigation prevents anaerobic status, which generates CH4, in paddy filed
- However, reduction of CH4 itself does not bring benefits to farmers
- It is difficult for famers to measure CH4 emission

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For Famers, Their Own Benefit Comes First, Reduction of CH4 Comes After.

Conclusion

- For both governments and farmers, adopting new technology cannot be successful without agricultural benefit, like productivity or water supply
- Adaptation to climate change itself can be own benefit for farmers
- However, mitigation cannot

✓Mitigation technology which contributes to agricultural benefit needs to be developed

✓When disseminating to farmers, showing their own agricultural benefit is important

- Climate Smart Agriculture (CSA)

✓*sustainably increase agricultural productivity and incomes;*

✓*adapt and build resilience of people and agri-food systems to climate change; and*

✓*reduce or, where possible, avoid GHG emissions. (FAO)*