



# Saharan Africa

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# In memorium

The father of Chinese Hybrid rice Dr. Yuan Longping – 22 May 2021



**5<sup>TH</sup> INTERNATIONAL  
RICE CONGRESS**  
SINGAPORE 2018

# Africa Rice Center (AfricaRice)

**A CGIAR Research Center and a pan-African intergovernmental association (dual nature)**

Mandate to support its member states in developing the rice sector through research, development and partnership activities

AfricaRice contributes to boosting the rice sector of Sub-Saharan Africa through:



**Policy advice**



**Rice information and knowledge**



**Improved seed, crop management, processing technologies**



**Capacity development**



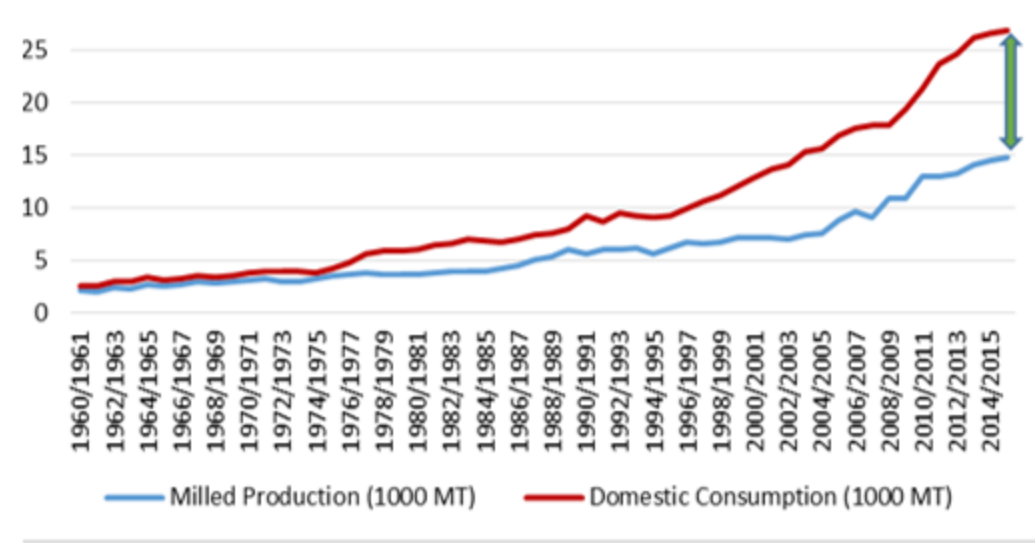
**Support to the development of rice value chains**

# Background

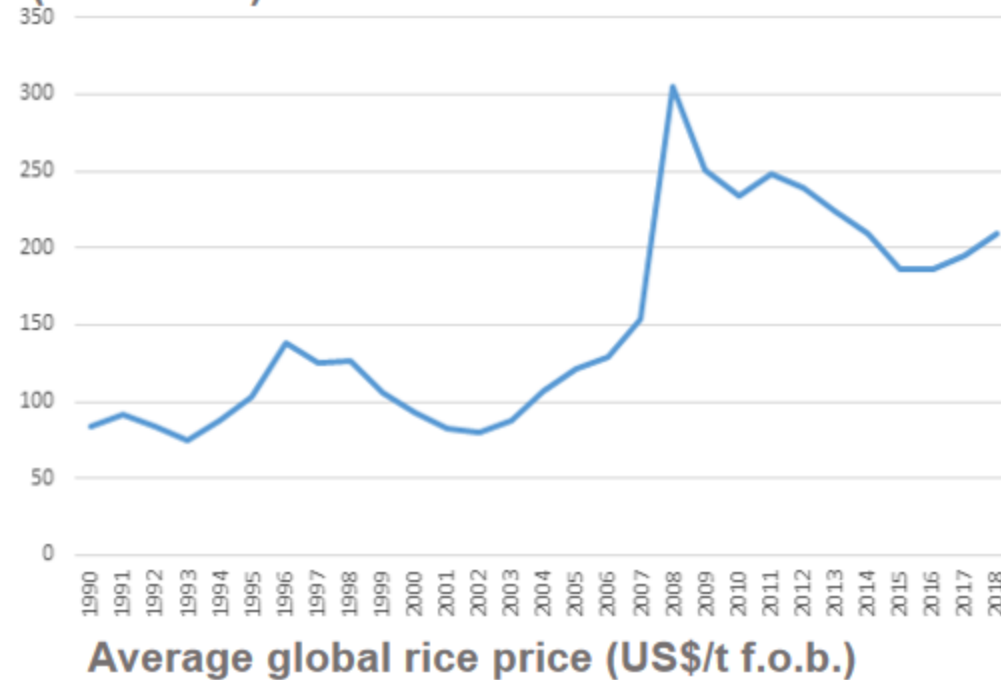
- Rice is an important staple crop in the world and feeds about **3.5 billion** persons in the world
- Global rice consumption in 2018 was estimated at more than **488 million tons** (MT) with Asia accounting for 90% of the production and consumption
- In Sub-Saharan Africa (SSA), rice is fundamental for food security and social stability and therefore **it is a political crop**
- Rice consumption in SSA is **increasing faster** than any part of the world:
  - Demand is growing at > 6% per year
  - Fast urbanization: 31.4% in 2000; 38.8% in 2015; 44.2% in 2025 and 52.5% in 2040
  - Income growth (GDP per capita constant 2011): \$3640 in 2017 and \$3925 in 2024
  - Women's increasing participation in employment (ILO stat)

# Background

- Production has been increasing, but a gap persists, fulfilled imports
- In 2018, imports were approximately 15.5 MT. The estimated **import bill of the rice was US\$ 6.4 billion**
- Import dependency makes African countries increasingly vulnerable to:
  - price volatility
  - Unpredictable global rice supply conditions –e.g. COVID19



Milled production Vs. Domestic consumption (1960-2015)



# Background

## Challenges facing the African rice sector

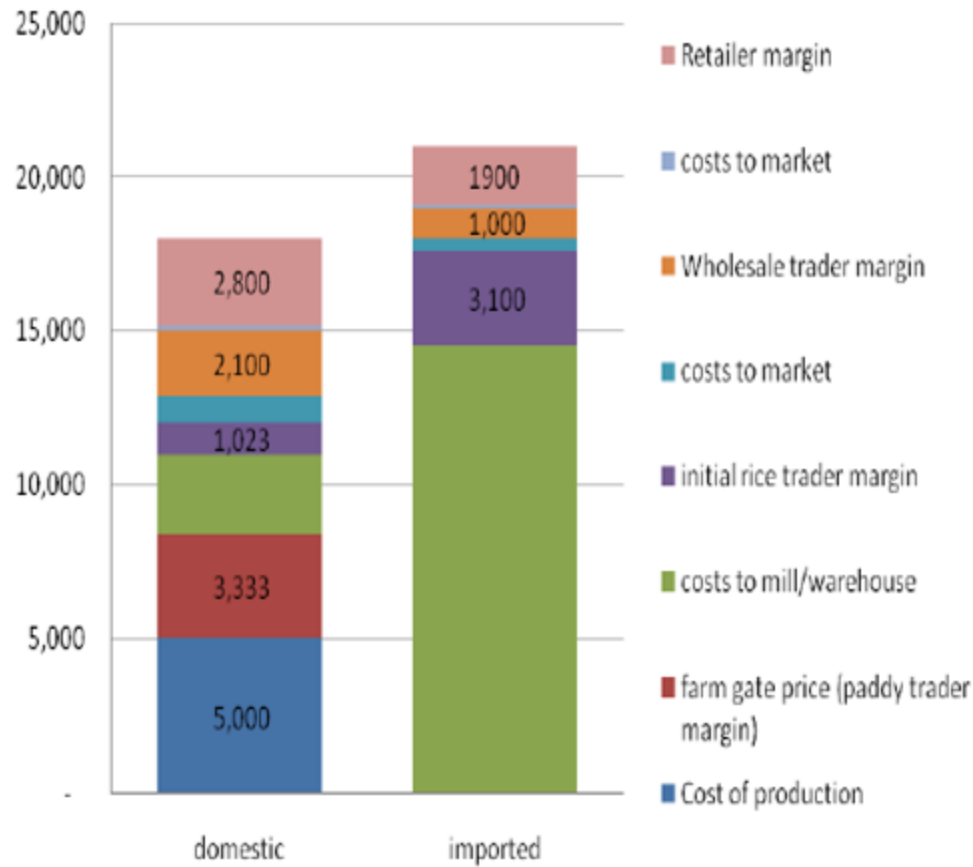
- Rainfed production systems: relatively lower productivity
- High cost of production
- Climate change: predicted to cause yield losses in rice
- Biotic and abiotic stresses: drought, salinity, flooding, iron toxicity, extreme temperatures, pest and diseases
- Traditional manual labour in production & post-harvest operations: post-harvest losses >16%

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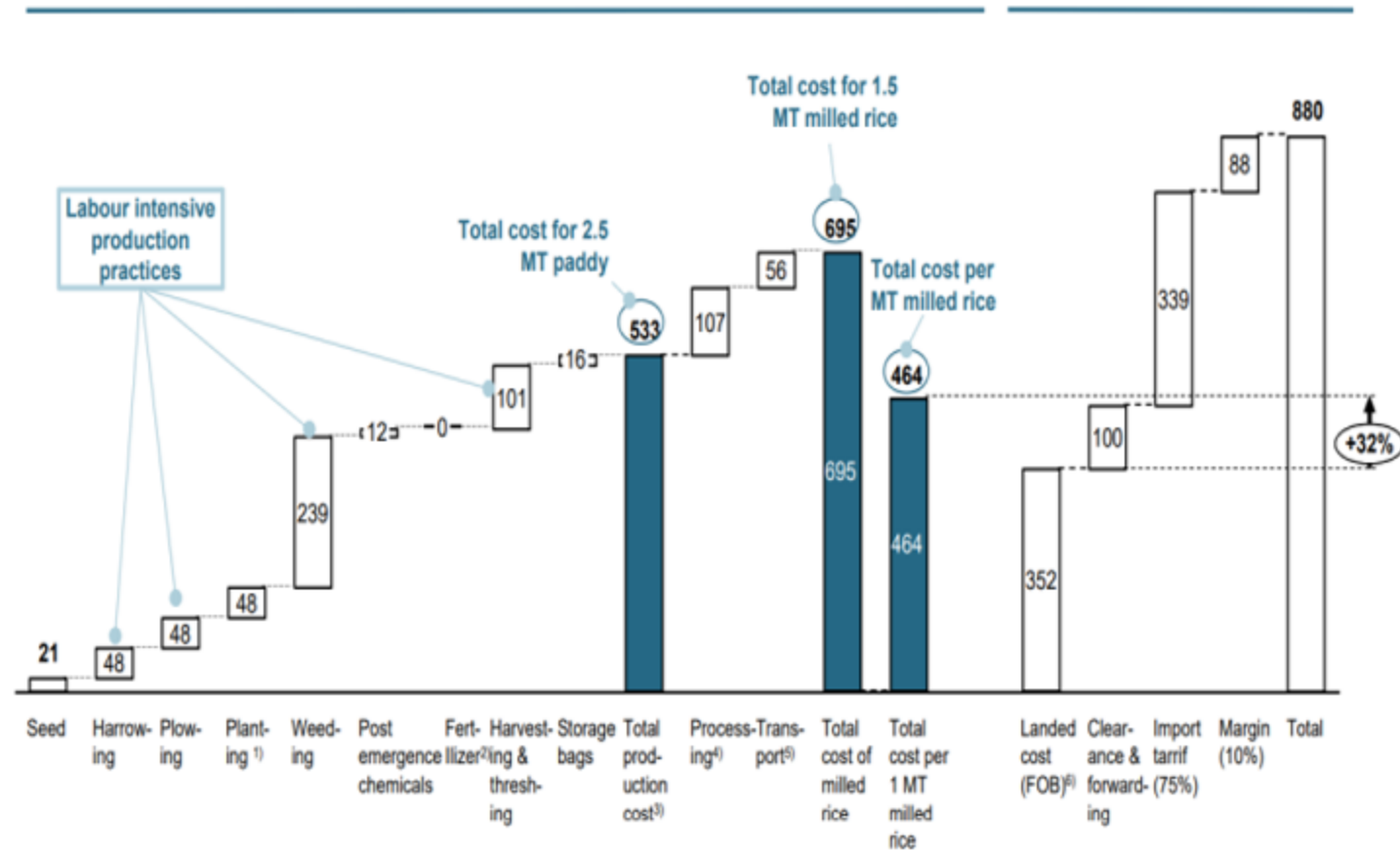


# Background

## Challenges facing the African rice sector



Cost of 1 MT milled local rice on smallholder rainfed farm



Nigeria: Import vs. Domestic margins

Tanzania: Cost comparison of import & local milled rice, USD (2012)

# Development of the RVC in SSA

- Sustainable increase rice production and rice productivity
- Quality & value-chain upgrading investment
- Conducive policies for smallholder and agribusiness development



# RVC Development 1: Production & Productivity

- Rice yield from 1996 to 2018
  - 1996-2007: **10%** increase ( to 1.80t/ha)
  - 2008-2018: **27%** increase (to 2.28 t/ha)
  - Yield increase has not been sustained
  
- Rice production from 1996 to 2018
  - 1996-2007: **31%** increase (to 13.7 MT)
  - 2008-2018: **103%** increase (27.9 MT)

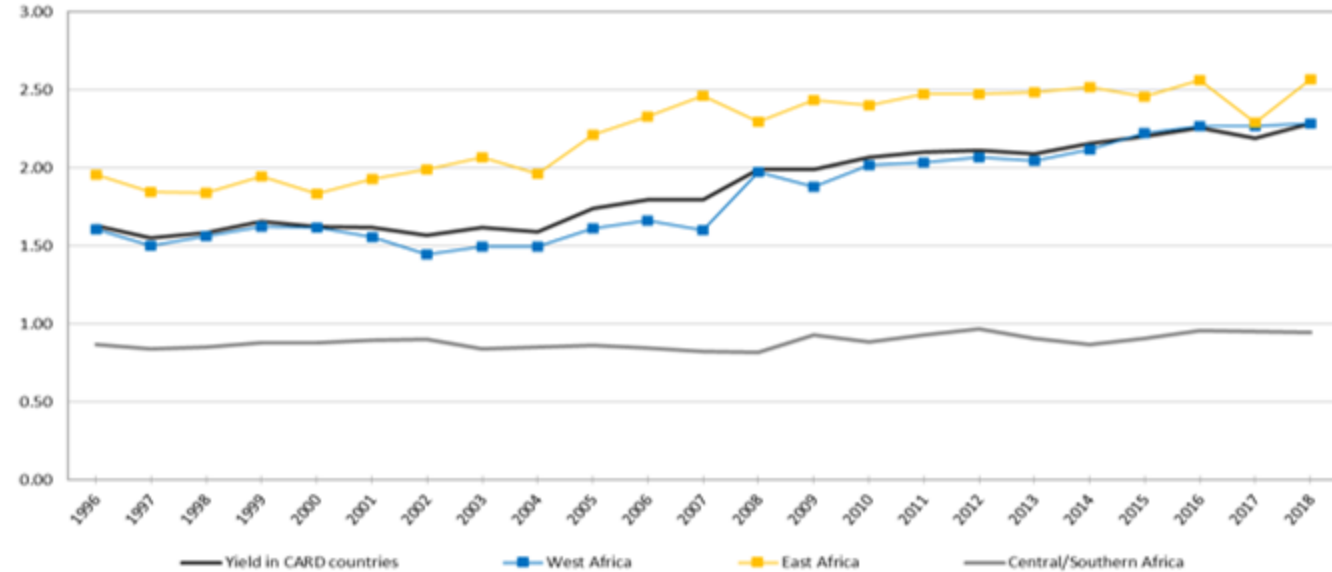


Fig. 4. Trend in rice yield in the CARD countries (t/ha)

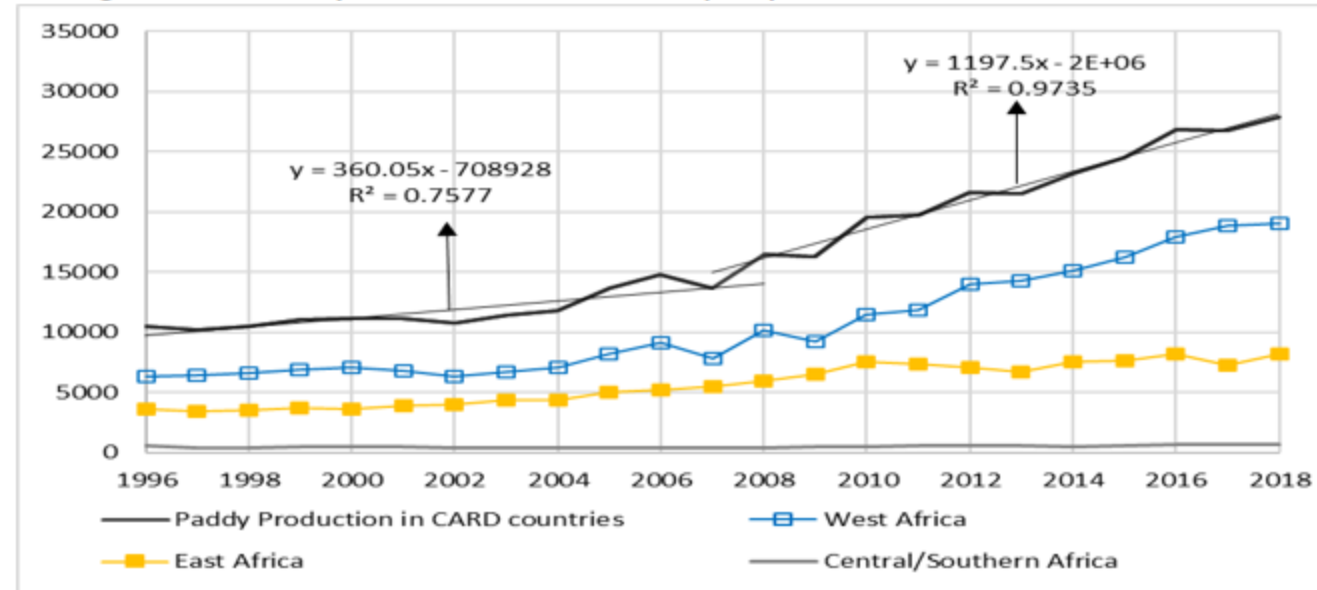


Fig. 5. Trend in paddy production in the CARD countries (1000 tons)

# RVC Development 1: Production & Productivity

- Yield factors:

- **Yield-limiting factors:** drought, flood, nutrient deficiencies, extreme temperatures
- **Yield-reducing factors:** insects, diseases, weeds, birds
- **Socio economic issues:** production orientation, household wealth, access to input and output markets, **access to rice knowledge and technologies (extension)**

- Yield variation depends on:

- Irrigation
- application of good agricultural practices: mechanisation, fertilizer application, etc.
- varietal replacement : 447 varieties between 1960 and 2010; 138 since 2014; hybrid varieties

Variety	Potential Yield (T/Ha)	Yield on farmer field (T/Ha)**
AR032H	10.00 - 11.00	6.94
AR051H*	10.00 - 11.00	7.01
AR606H*	12.00 - 13.00	8.28
AR647H	13.00 - 14.00	10
AR708H	13.00 - 14.00	9.12
AR032H	11.00	8.9

Hybrid variety yields: potential yields and on farm yields (T/Ha) in 2020



## RVC Development 2: Quality & value-chain upgrading investment

- Gap in the quality of rice produced and delivered to domestic consumers vis-à-vis the quality of imported rice available
- Local tastes have aligned to Asian rice over the years
- But more than 30 studies in WA & EA demonstrated:
  - Differences across countries and cultures
  - Common attributes: good taste, clean rice
  - Consumers are willing to pay for quality

# RVC Development 2: Quality & value-chain upgrading investment

## Technologies & practices to upgrade quality

- Mechanisation: e.g. Threshers/ASI thresher
- On farm practices:
  - Influential factors: GAPs, drying, storage
  - Biophysical factors have a dominant effect
    - tropic cool-warm conditions: ↑ chalkiness
    - humid-arid conditions: ↑ fissures.
- Parboiling technology: ↓ % chalky grains, fewer broken fractions
  - More nutritious
  - Increases milling rate
  - Increases market value
  - Creates employment opportunity for women and youth
  - Proved in WA, being piloted in EA

Traditional threshing on barrel	Thresher	
32	445	Capacity (kg/man/h)
4.13	0.14	% losses
79.4	89.5	% germination rate

→ Labour saving technology



# RVC Development 2: Quality & value-chain upgrading investment

## Technologies & practices to upgrade quality:

- Milling quality
  - Varieties
  - Low moisture content leads to ↑ breakage
    - preferred for long term storage
    - due to farmers & millers' practices of overdrying
  - The type of mills:
    - Engelberg type mill
    - Satake commercial rubber roll mill

→ → The number of modern rice mills is increasing



State of rice value chain upgrading in 15 countries in West Africa, 2009

Country	Number of investments that were operational in 2019	Aggregate upgraded milling capacity (tons per hour)	Origin of investments
<i>Group 1: Dynamic rice value chain upgrading</i>			
Nigeria	24 industrial mills	177	FDI, DPI
Senegal	15 industrial and semi-industrial mills	60	FDI, DPI
<i>Group 2: Moderate rice value chain upgrading</i>			
Ghana	1 industrial mill, 3 semi-industrial mills	26	FDI, DPI
Mali	4 industrial mills	20	FDI, DPI
Côte d'Ivoire	2 industrial mills, 1 semi-industrial mill	15	PI, DPI
Burkina Faso	1 industrial mill, 1 semi-industrial mill	7	DPI
Liberia	2 semi-industrial mills	4	DPI, PI
Niger	2 semi-industrial mills	4	PI
Sierra Leone	1 semi-industrial mill	2	DPI
Benin	17 ESOP	-	DPI
Togo	15 ESOP	-	DPI
<i>Group 3: No rice value chain upgrading</i>			
Guinea	-	-	-
Mauritania	-	-	-
The Gambia	-	-	-
Guinea-Bissau	-	-	-
West Africa	57 upgraded units	315	

## RVC Development 3: Policies

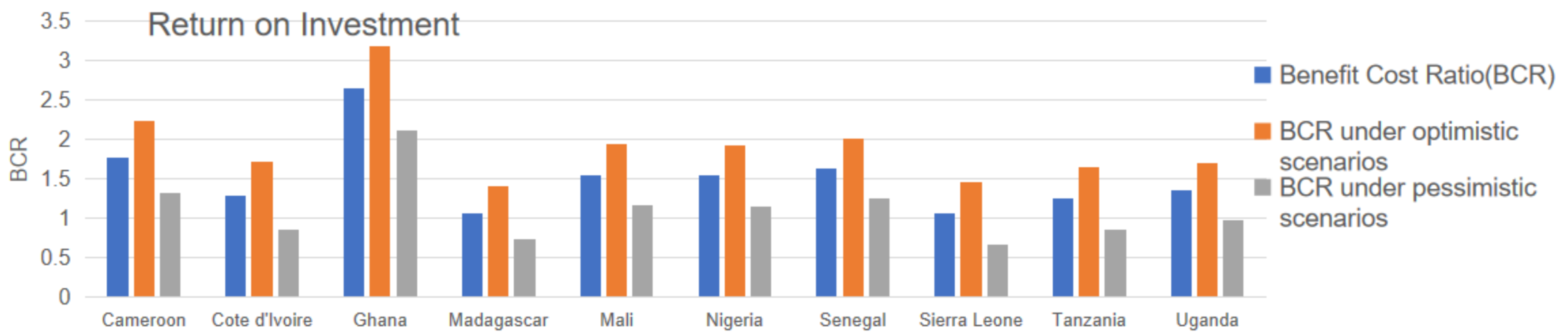
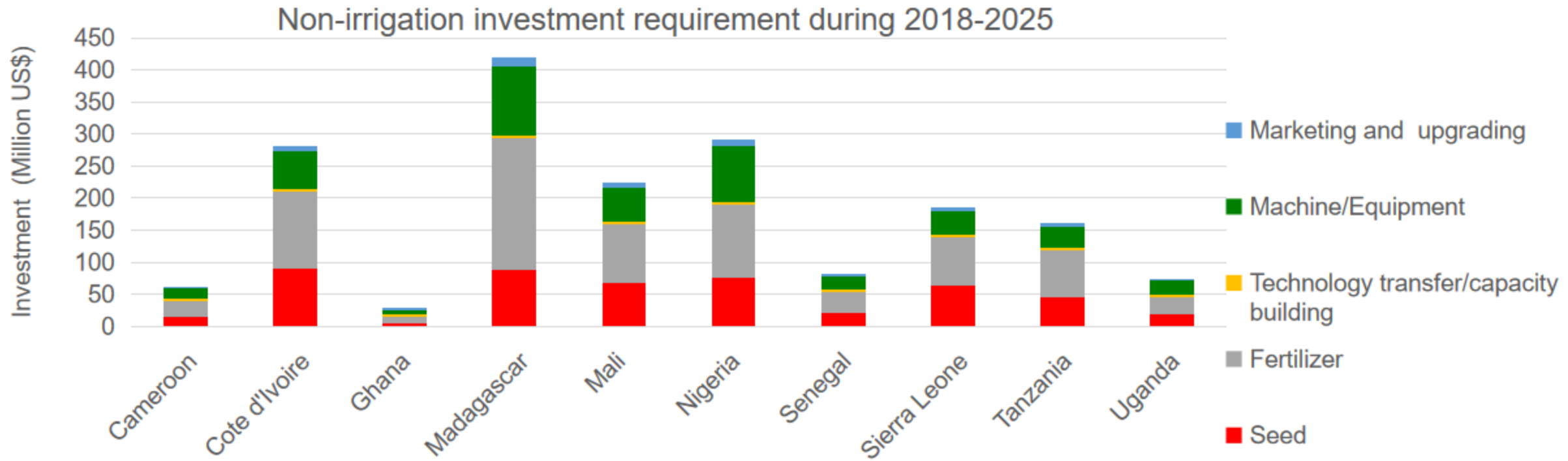
- Protective external tariffs

- ECOWAS : 35%; EAC: 75% or USD 345/MT
- Depressive impact on demand for imported rice
- Consumers will incur a high cost under the potential change in trade policy
- The CET will increase urban poverty

- Reversing urban bias

- Supply-shifting investments may be insufficient to render domestically produced rice competitive against imported rice
  - Emphasis on availability, affordability and quality
- Accelerate & sustain self-sufficiency
- Increase production: Seed; Fertilizer; Machine/equipment; Technology transfer/capacity building; Marketing & upgrading the RVC; Irrigation

# RVC Development 3: Policies



## RVC Development 3: Policies

- Policy sequencing and investment priorities

- (1) Import dominance is high

- Product quality, improve milling, VC function-market development
    - Increase productivity- reliable supply
    - Branding & promotion (demand-lifting)

- (2) Consumption of local rice is high

- Increase productivity & production
    - Quality upgrading, milling & marketing
    - Export markets

- (3) Landlocked countries

- Increase productivity & production
    - Quality upgrading, milling and VC function
    - Upgrading internal marketing infrastructure
    - Regional value chain approach



## RVC Development evidences

- Senegal : rice harvested area has increased by expansion of dry-season rice cropping in the Senegal River valley:
  - yield under irrigation reaches 5.4 t/ha in the wet season and 6.8 t/ha in the dry season
- Mali: yield increase between 56 and 86% due to SRI (<https://www.scidev.net/afrique-sub-saharienne/agriculture/article-de-fond/sri-autosuffisance-en-riz.html>)
- Modern processing units : Nigeria, Senegal, Rwanda, Ghana, Uganda, etc.
  - Improving quality of milled rice is possible
  - But problem of packaging material persists
- Nigeria increased importation by 71% but **decreased from 30% to 22%** of total import by CARD countries  
<https://theeagleonline.com.ng/nigeria-responsible-for-collapse-of-our-rice-mills-thailand/>
- Nigeria has also **banned illegal importation** through Benin  
<http://www.beninto.info/2018/07/27/cotonou-et-abuja-contre-le-riz-de-contrebande/>
- [How GEM Technology is pushing Africa towards Self-sufficiency in Rice - World | ReliefWeb](#)

## RVC development Areas: investment & policy

- Irrigation: expansion and rehabilitation
  - ensure appropriate management of the irrigation schemes and efficient water management
- Weather information
  - climate resilient agriculture
  - climate-smart varieties
- Extension and advisory service; regulate and strengthen the input delivery system
- Seed policy: production, certification and distribution systems
- Mechanization
- Storage infrastructure including drying

## RVC development Areas: investment & policy

- Promote use of rice quality upgrading technologies (e.g. parboiling)
- Transportation infrastructure (roads) and other investment in rural infrastructure (e.g., market facilities, electricity)
- Provision of credit facilities;
- Strengthen and upgrade the capacity of agro-dealers, farmers' organizations
- Establishment of state-of-the-art rice milling facilities
- Sensitization of traders, consumers on pertinence of quality;
- Market development: aggregation and contractual arrangements; minimum guaranteed prices for paddy

# RVC development Areas in South-South Cooperation

- Increase production and productivity
  - New technologies:
    - Hybrids and other varieties
    - Precision farming : the crop and soil receive exactly what they need for optimum health and productivity
    - Climate change: climate smart technologies
  - Technology transfer:
    - Training and supportive factors (irrigation facilities, timely access to agricultural credit, farm inputs);
    - Close linkage of the agricultural training program to local extension services is essential including building capacity of professionals
- Rice Quality:
  - Modern milling equipment
- International organizations to purchase local rice
  - World Food Program and relief organizations are encouraged to source their supply locally from African countries rather than imports, especially when the locally produced rice meets the required quality standards.



**Thank You**

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