

Economic Transformation
The Role of Agricultural Research and Productivity

Hartmann
IITA

Seminar
National Institute for Economic and Social Research
Ibadan, Nigeria

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MEGA TRENDS

STAGE – Africa

STAGE – Nigeria

RESEARCH – Productivity

YOUR - Indulgence

The stage – Africa

Africa growing

Billionth African 2009 the
400 million in West/Central Africa
584 million in less than 15 years

Africa richer

Richer than Indians

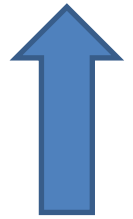
Africa attracts

2008 DFI increased 16% in Africa but fell elsewhere

Africa's good news

Growth from domestic market not natural resources

Since 2008
African food production per person



CONCERNS

Agricultural productivity - fertilizer per hectare

Kilograms of fertiliser per hectare

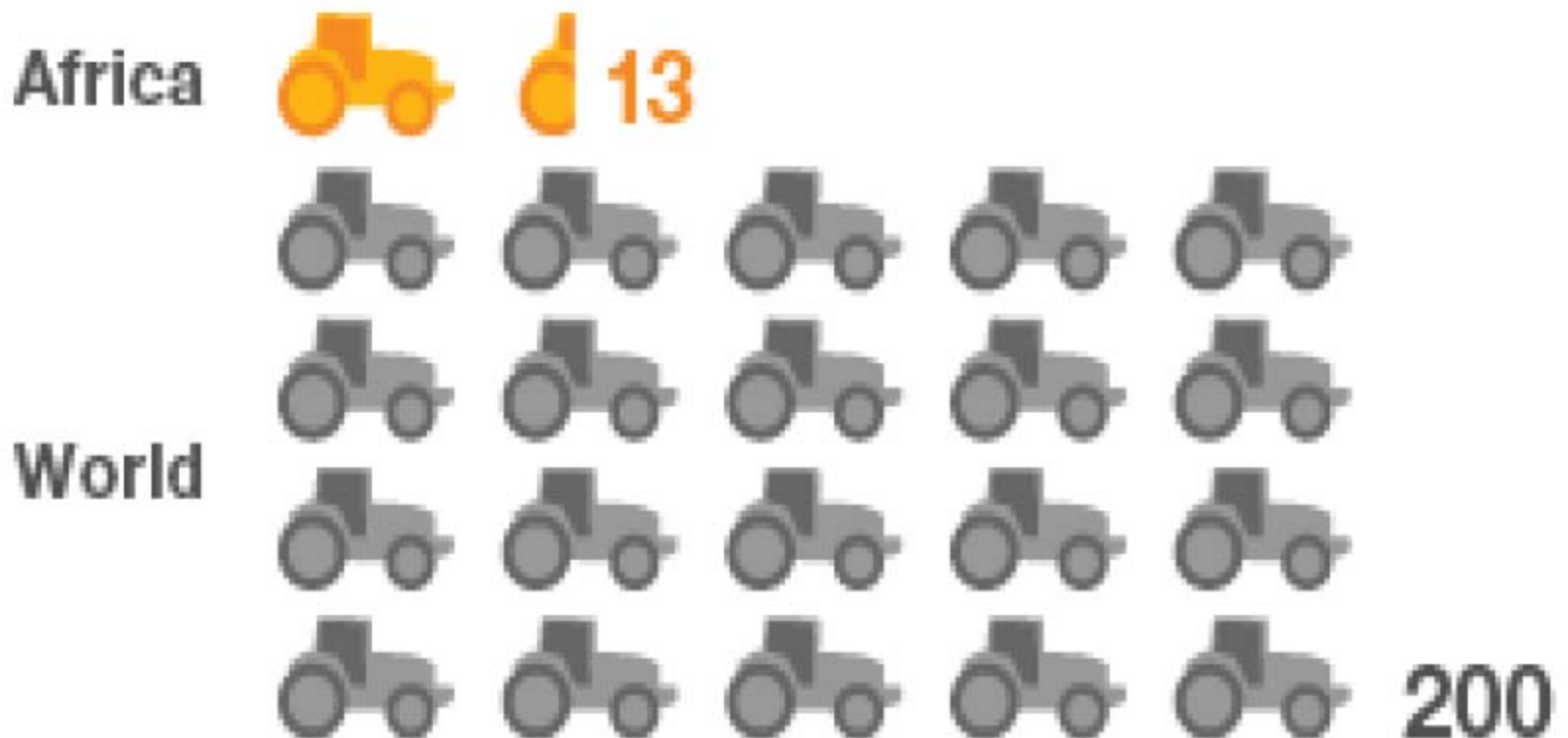


Note: World averages

Source: The New Harvest

Agricultural productivity – tractors per 100 square km

Tractors per 100 km²



R4D Expenditures - 2009

We invest
4% of what
Asia does!

National R&D expenditures and share of world total, by region: 2007

(Billions of U.S. PPP dollars)



PPP = purchasing power parity

NOTES: Foreign currencies converted to dollars through purchasing power parities. Sources track R&D for 126 countries. Some country figures are estimated.

SOURCES: United Nations Educational, Scientific and Cultural Organization (UNESCO), Institute for Statistics, <http://www.uis.unesco.org>, accessed October 2009; and Organisation for Economic Co-operation and Development, Main Science and Technology Indicators (2009/1).

The stage – **Nigeria**

Nigeria - 150 million-market

Middle class - 30% of the population - growing fast

Other signs of a flourishing Nigeria.

A Lagos mall generated \$90 million in sales - 2007

Nigeria 10 fastest-growing beverage markets in the world

Real estate - Victoria Island = Manhattan, USA

Annual return on capital - 65% higher than China, India, Vietnam, or Indonesia

Advertising \$600 million - 2007, six-fold increase - 2000
Communication and Banking doing well

At LONG last

RAILWAYS

are getting some overdue attention

The best for last

National Pride: music, tastes, and culture.

Sources of national identity.

Important to the pursuit of productivity.

Companies must adapt to local tastes

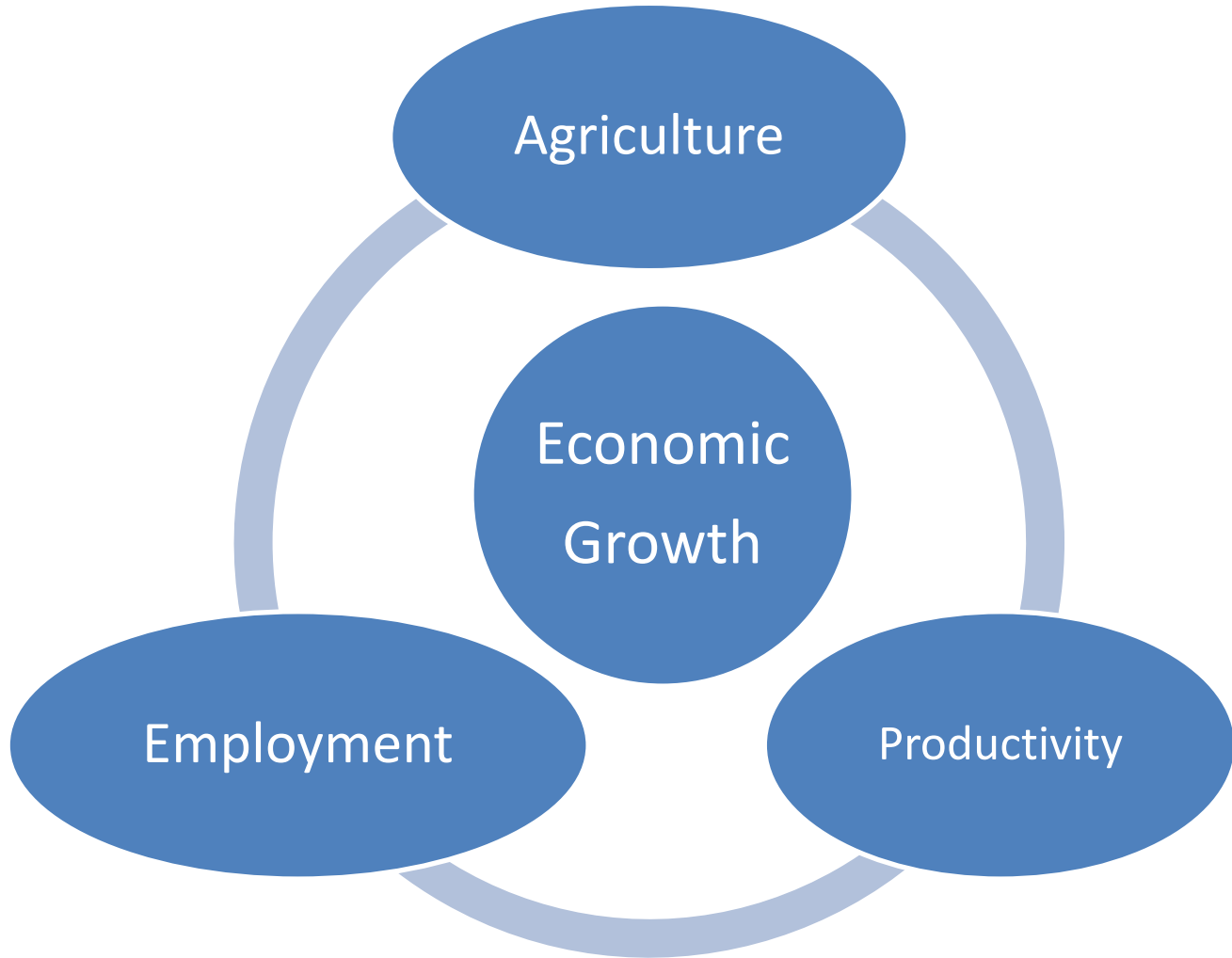
In spite of

Nigerians achieving in spite of poor infrastructure and a difficult business environment.

Nigeria is ranked 137 out of 150+ countries on ease of doing business (World Bank).

For a country so well endowed, this is a sad statement.

Interlinked



Agriculture - most powerful tool
employment, public health, economic growth

stimulate small - medium industries
growth and employment.

Sector far from its potential

Nigeria – its agriculture

arable land

variety of ecologies

North to South

East to West

Kano to Calabar

Oyo to Adamawa

Nigeria can grow, produce, process, and enjoy and trade a broad spectrum of food and cash crops.

Agriculture a neglected sector

Constraints - inadequate infrastructure
 - doing business



Less known

- limited application of technologies
- low skill base in the sector
- aging population

Suboptimal production = problem

Inadequate knowledge of management practices

Economic efficiency (management) ranges widely
3-67%

 economic efficiency =  productivity

no new technology or greater resource base

Problems X discourage

Problems = profits and progress

It is possible!

Success stories - India, China – yield increases possible

One generation

Brazil → global farm giant

Vietnam → importer to second largest exporter

Nigeria provides examples.

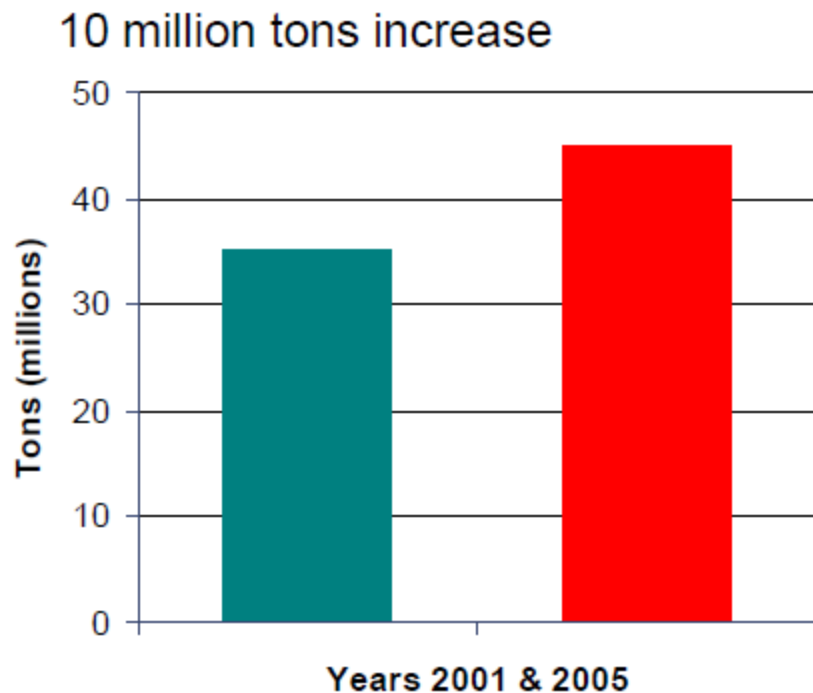
Cassava king

Soybean king

Plantain king

Cassava Production

Presidential Cassava Initiative - Nigeria



No price decline

Source: FAOSTAT

What must Nigeria do?

Preconditions

peaceful environment

PEACE = PROGRESS

Infrastructure

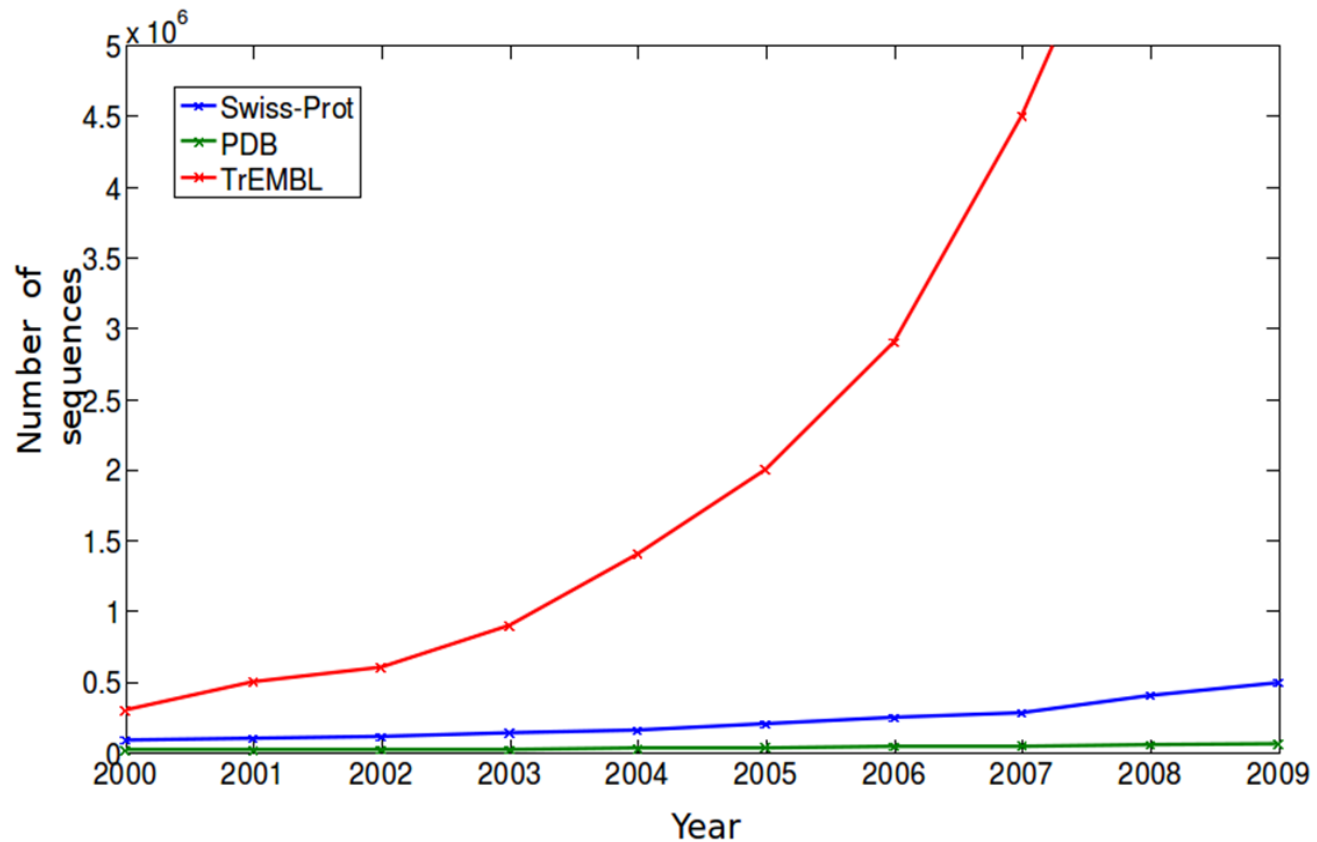
reliable energy

better transport (air, rail, road, water)

communication - bandwidths

Growth of biological databases

1100 published genomes
4543 on-going genome projects



Some winds are blowing in Nigeria's favor

Scientific advances
biological sciences
ICT technologies

Nigeria
arable land
varied diets
yield gaps
Rural-to-urban migration
labor shortages
urban markets

Opportunities - e.g., migration

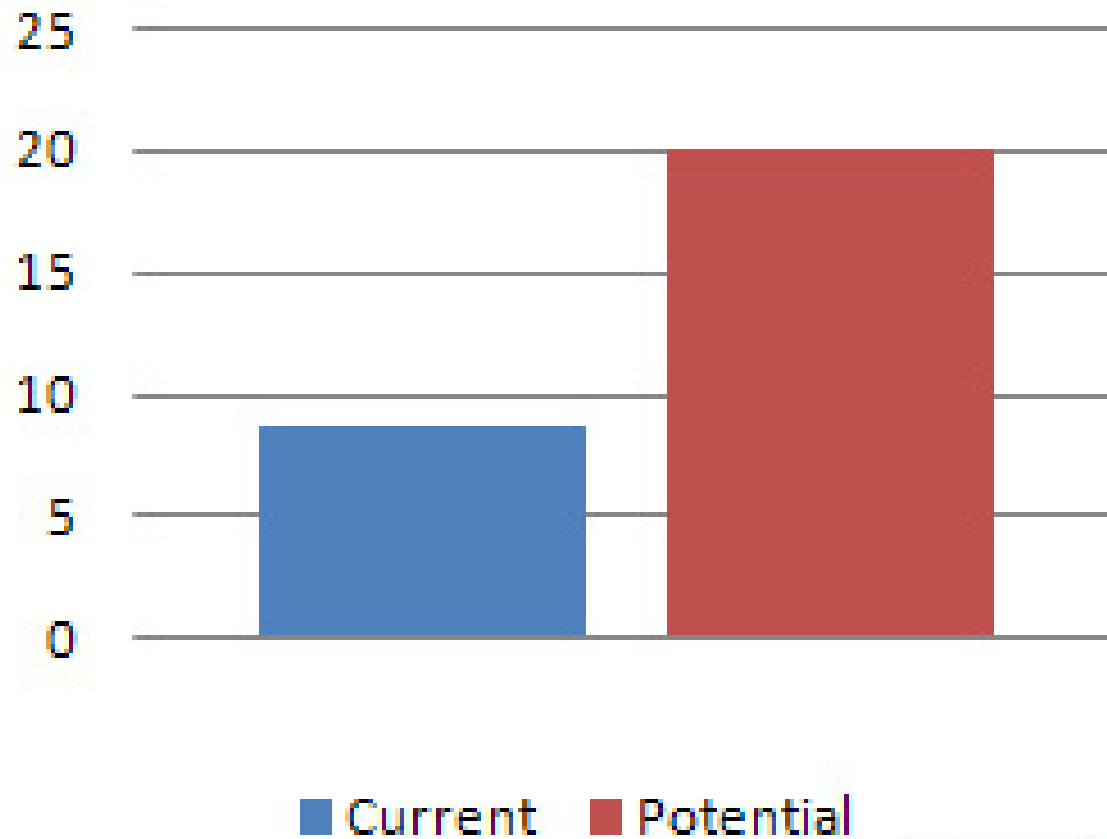
more technical agriculture

more concentrated markets

more product diversification

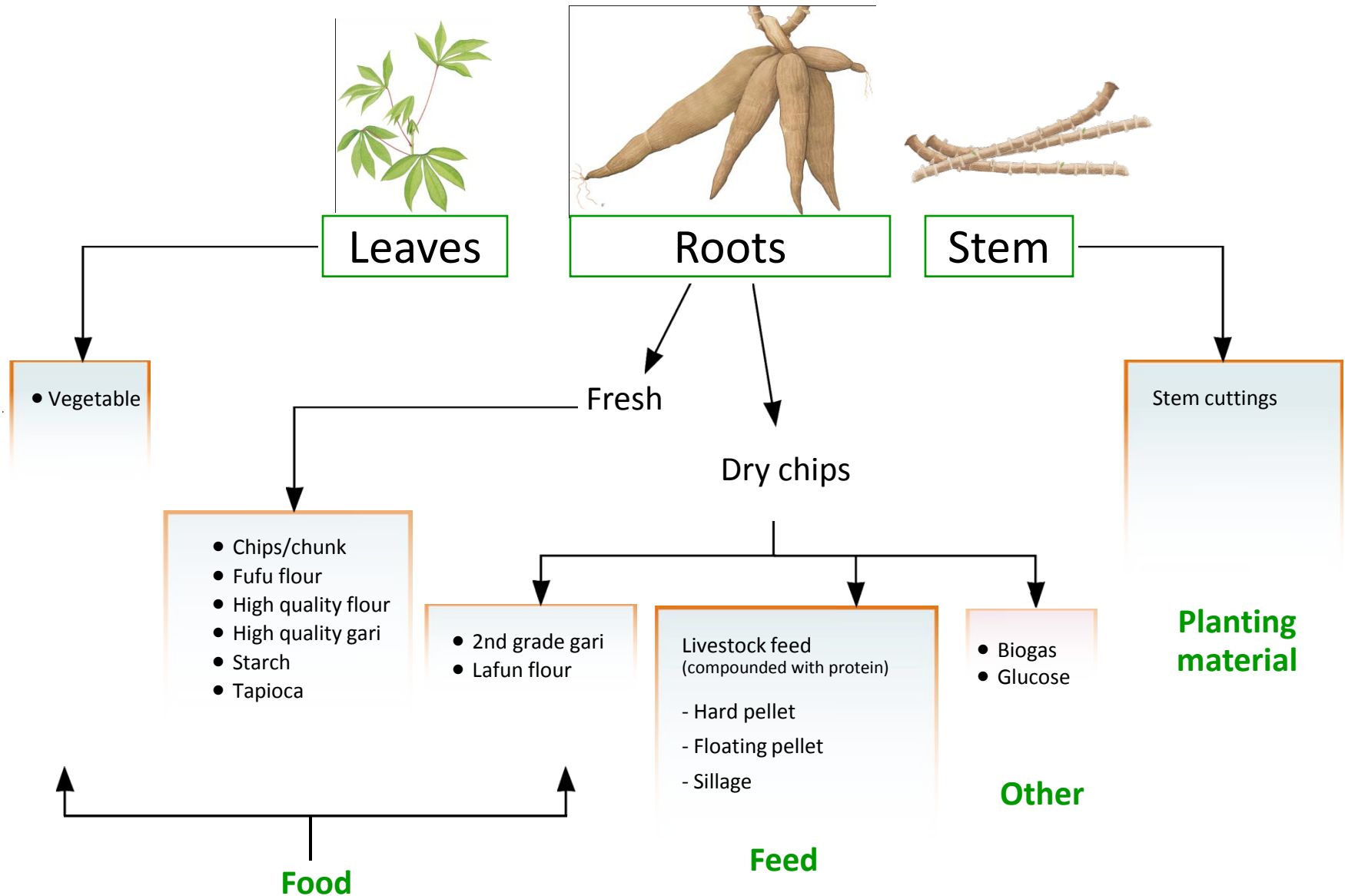
increase productivity

Cassava Yield Potential



source: IITA

Cassava utilization pathways



YIELD GAPS

YAM

MAIZE

BANANAS

PLANTAIN

Headwinds

Biological threats (pests & diseases)

cowpea, cassava, banana, coconut
Under attack and new attacks will come

Population growth – fast – youth = big challenge

40 million and growing

Unemployment high - need productive outlets

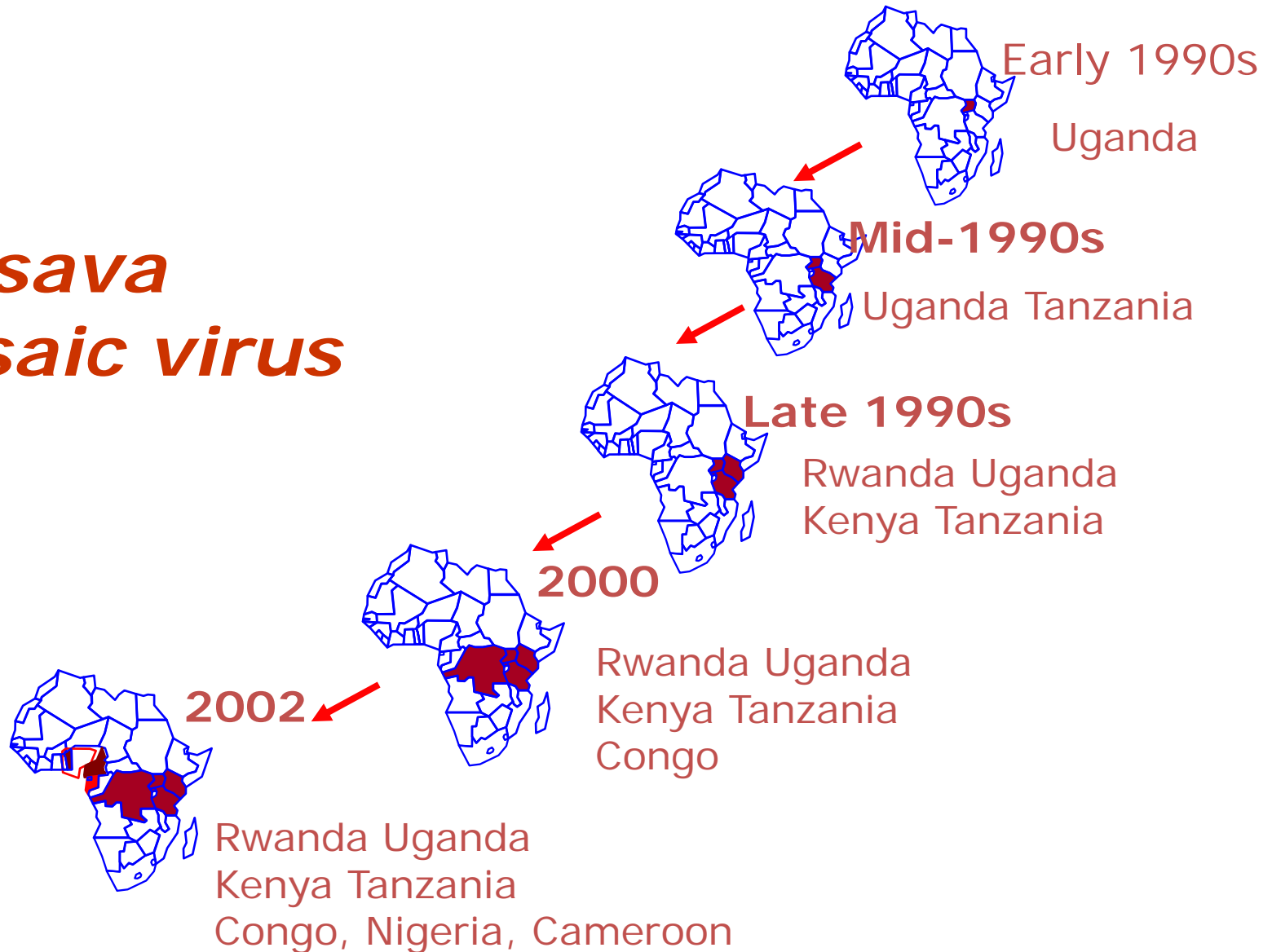
Economic and population  = pressure on food systems

Postharvest **losses** huge. 30 to 60% are common

*Postharvest **losses** can become postharvest **profits***

A biological threat – The spread of a Virus

Cassava mosaic virus



We are not alone

Agriculture has friends

Examples

the power of friends

Absolute levels of agricultural R&D spending and staffing, 2008

SPENDING \$ (2005)

STAFFING (FTE)

SPENDING \$ (2005)			STAFFING (FTE)		
> \$50 million	\$10 to 50 million	< \$10 million	> 500	100 to 500	< 100
Nigeria (404)	Côte d'Ivoire (43)	Burundi (9)	Nigeria (2,062)	Mali (313)	Botswana (97)
South Africa (272)	Senegal (25)	Togo (9)	Ethiopia (1,318)	Uganda (299)	Niger (93)
Kenya (171)	Mali (25)	Zambia (8)	Sudan (1,020)	Mozambique (263)	Mauritania (74)
Ghana (95)	Botswana (23)	Mauritania (6)	Kenya (1,011)	Burkina Faso (240)	Rep. of Congo (71)
Uganda (88)	Mauritius (22)	Niger (6)	South Africa (784)	Guinea (229)	Namibia (70)
Tanzania (77)	Namibia (22)	Sierra Leone (6)	Tanzania (674)	Madagascar (212)	Sierra Leone (67)
Ethiopia (69)	Benin (22)	Rep. of Congo (5)	Ghana (537)	Zambia (209)	Togo (63)
Sudan (51)	Malawi (21)	Guinea (4)		Mauritius (158)	Gabon (61)
	Burkina Faso (19)	Eritrea (3)		Senegal (141)	The Gambia (38)
	Rwanda (18)	The Gambia (3)		Zimbabwe (139)	
	Mozambique (18)	Gabon (2)		Malawi (127)	
	Madagascar (12)			Côte d'Ivoire (123)	
				Eritrea (122)	
				Benin (115)	
				Burundi (107)	
				Rwanda (104)	

Source: Compiled by authors based on country-level ASTI survey data and several secondary resources. (For more information, see individual ASTI Country Notes available at www.asti.cgiar.org.)

Notes: Total 2008 spending and capacity levels are shown in parentheses. Spending data for Zimbabwe were unavailable. Total expenditures for a number of countries differ from those published in ASTI's Country Notes because of recent World Bank revisions to their GDP deflator; for Kenya, Guinea, Madagascar, Mauritius, Mozambique, Nigeria, and Zambia this change was in the order of 2 to 20 percent. Further information on ASTI's data methodology and calculation procedures is provided on ASTI's website (www.asti.cgiar.org/methodology); see also Beintema and Stads (forthcoming).

NATURE TOO PROVIDES FRIENDS

A friend (left) working for African food security



Damage: destroyed 30 to 40% of the cassava

Benefit: ECOWAS region an estimated \$1.7 billion in 18 years





These workers were true to their word

- Problem largely controlled
- No pesticides
- No organized services
- Expanding on its own
- Our worker and his folks have reached 27 countries in tropical Africa

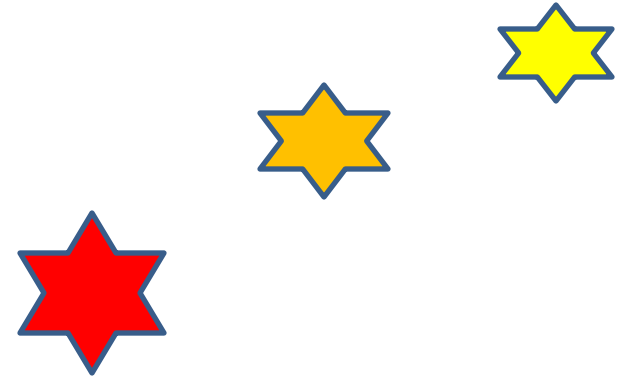
A sustainable program

Benefit: \$20 billion in 2004^[1]

Increase productivity







STARS aligning

Elections - no giving up rights

YOUR INDULGENCE

MEGA TRENDS

BIOLOGICAL TREATS - insurance

YIELD GAPS – close

MECANISE

FARMERS and Agribusinesses - the rest

YIELD GAPS – close

MECANISE

TRANSFORM/PROCESS

**Farmers and Agribusinesses
will do the rest**

“To fully protect its citizens, Africa needs a force against biological threats to its food crops that is as important as its military”.

Source: Hartmann, 2011, African Development Bank Annual Meeting, Lisbon, Portugal.

YOUTH

Not a one-act thing

Raising productivity is a continuous process.

Research institutions have to keep learning and improving to make worthwhile returns to the public investments in them.



Photo: IITA



VIRUS 1 - CMD

VIRUS 2 - CBSD

FRIENDS



VIRUS 1 - CMD

VIRUS 2 - CBSD

To sum up

Support young scientists

Invest in bandwidth

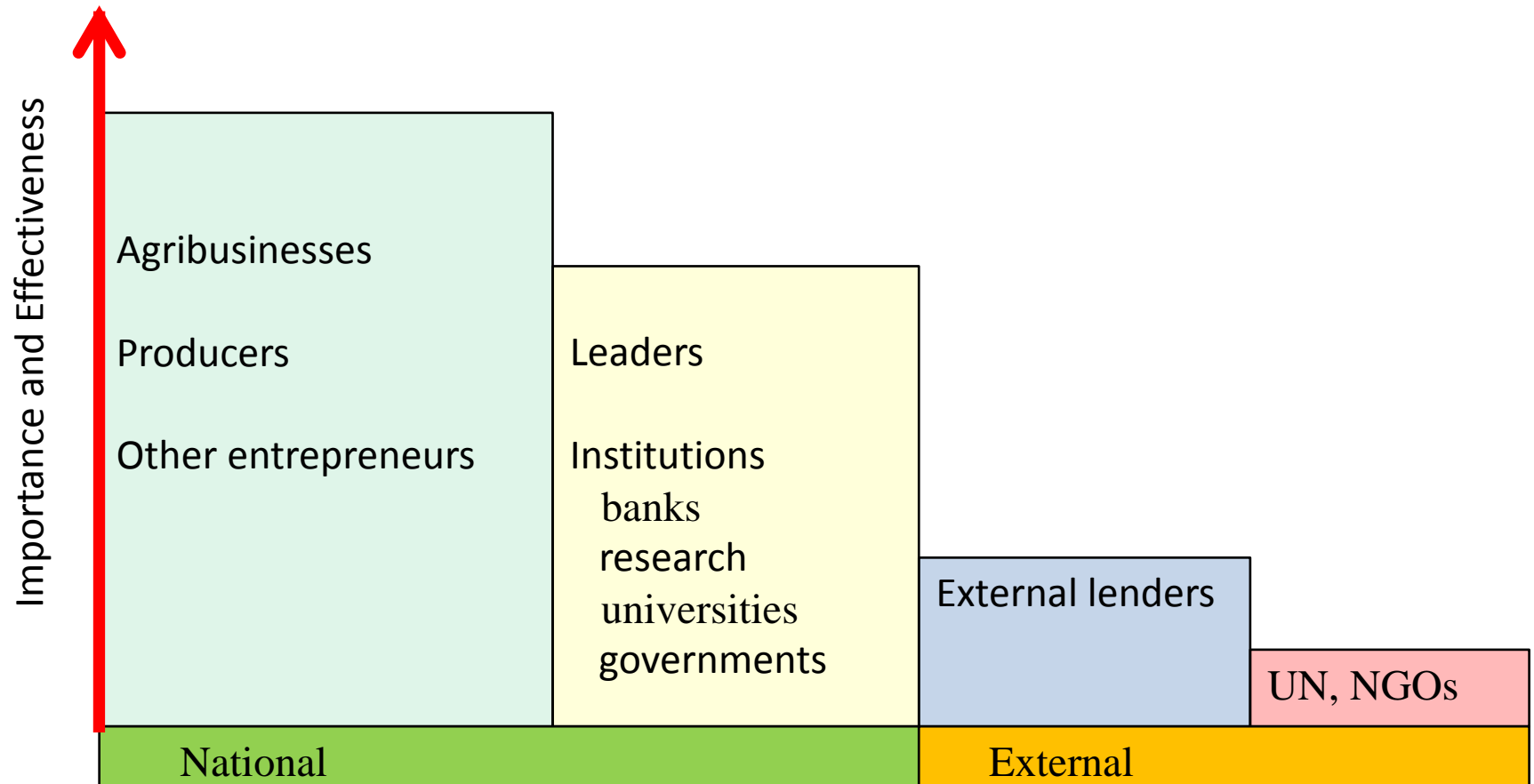
Reduce endless policy studies.

less assessment - more implementation

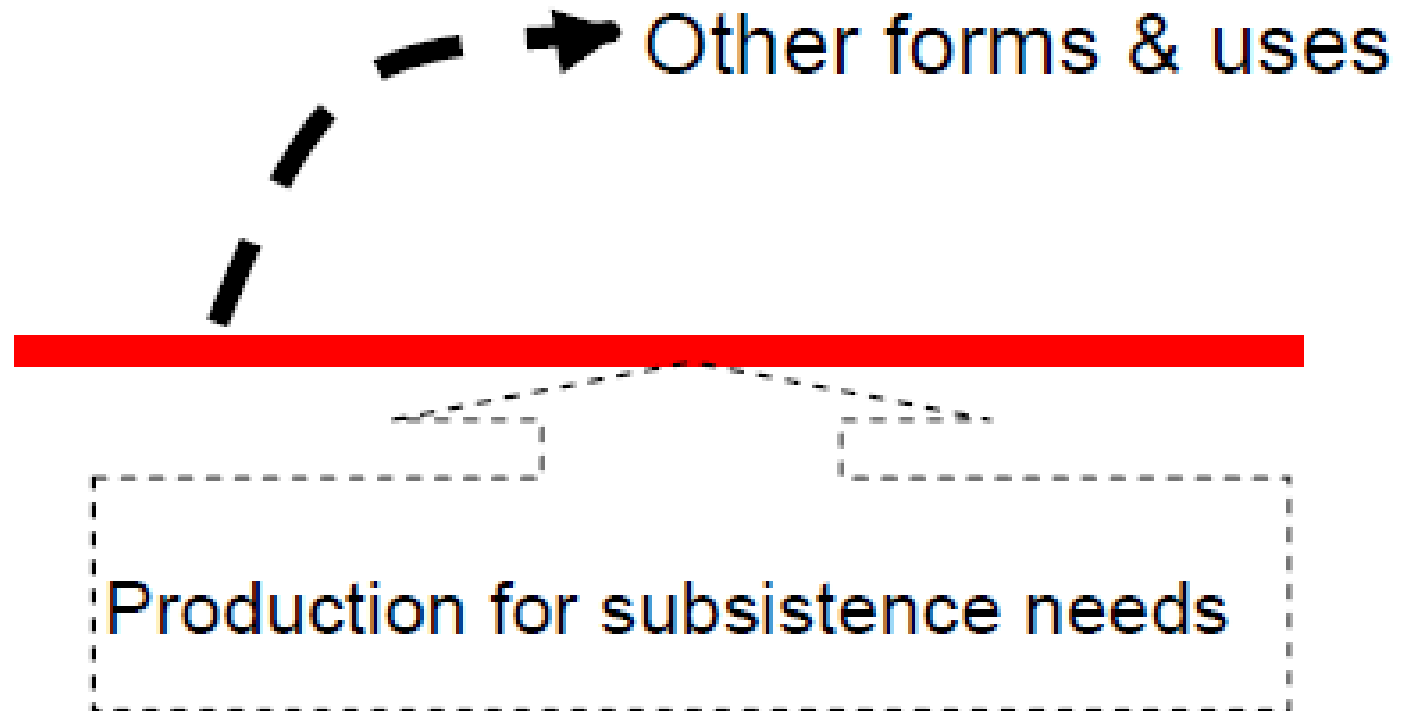
Build the missing national defense component

Convert postharvest losses into postharvest profits

Agricultural Development Force



Price stability and sector growth



Few have no role in an agricultural transformation

farmers
youth
men, women
researcher
politician
banker
processor
transporter
input provider
advertiser
wholesaler
retailer
health professional
engineer
logician
software programmer
lawyer

All segments of the country can find their place in it
Contribute to it and you will benefit from its success.

THANKS

For lending me your ears

Research to Nourish

plant health



innovation



harvests

biotechnology



partnership



environment



biocontrol

germplasm health

pest management

markets
resource management

IITA

maize

Africa

sustainability

people

banana

exchange

dreams

FUTURE
HARVEST

