



Structural Transformation and Future Agro-industrialization Strategies in Africa

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Outline

- ❖ Growth and Structural Transformation Process
- ❖ Agricultural Growth and Structural Change
- ❖ Patterns and Quality of Structural Change
- ❖ Transformation of Agribusiness Value Chains
- ❖ Implications for Industrialization Strategies



KEY MESSAGES

- Two distinct phases of structural transformation
 - Productivity reducing structural change prior to recovery in 2000s*
 - Strong positive structural change during recovery years*
- Stunting (rapid decline) of agriculture during decades of slow growth
- Bloated (rapid expansion of) informal goods and services sector (IGS)
 - IGS is largest pool of low productivity labor*
 - dual economy model (ag vs non-ag) no longer applicable*
 - Three-dimensional model of industrialization is required*



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ECONOMIC GROWTH AND TRANSFORMATION PROCESS

- COUNTRIES BECOME RICH BY PRODUCING MORE OUTPUT PER GIVEN WORKER
 - ⇒ *THIS INVOLVES PRODUCING MORE OF THE SAME GOOD*
 - ⇒ *AND MORE IMPORTANTLY, PRODUCING A LARGER BASKET OF HIGHER VALUE GOODS*

- COUNTRIES ALSO BECOME RICH OVER TIME
 - ⇒ *STARTING FROM AN AGRICULTURAL AND RURAL BASE*
 - ⇒ *MOVING TO AN URBAN AND INDUSTRIAL BASE*

ECONOMIC GROWTH AND TRANSFORMATION PROCESS

○ THE DOUBLE CHALLENGE OF MANAGING THE GROWTH PROCESS

⇒ *RAISING PRODUCTIVITY IN THE AGRICULTURAL AND RURAL ECONOMY*

⇒ *WHILE DIVERSIFYING INTO HIGHER VALUE GOODS OUTSIDE OF AGRICULTURE*

○ LABOR PRODUCTIVITY GROWTH DURING TRANSFORMATION PROCESS

⇒ *WITHIN SECTOR GROWTH*

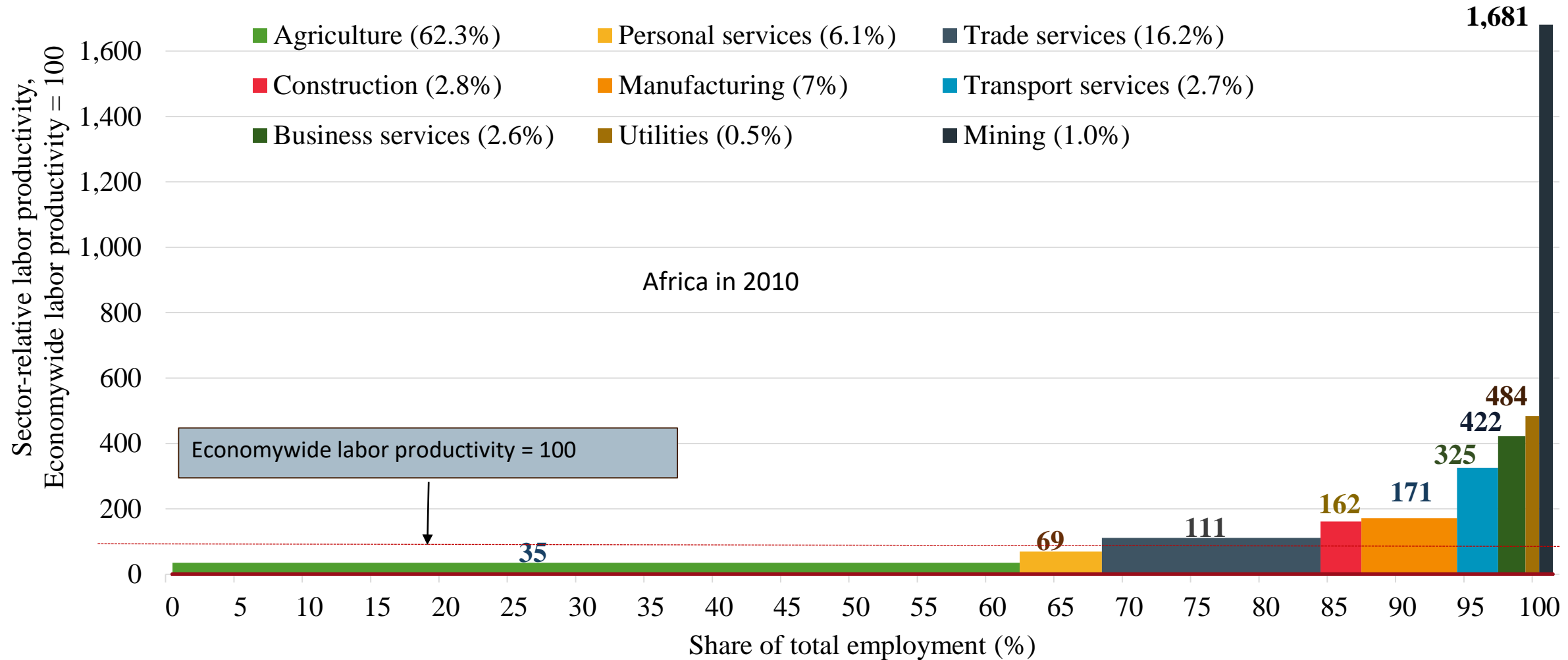
Increase in output per worker resulting from innovation and investments in factors of production in individual sectors

⇒ *GROWTH FROM STRUCTURAL CHANGE*

Increase in output per worker resulting from labor moving out of lower into higher productivity sectors

Scope for productivity raising structural change in Africa

Moving labor from agriculture to non-agriculture

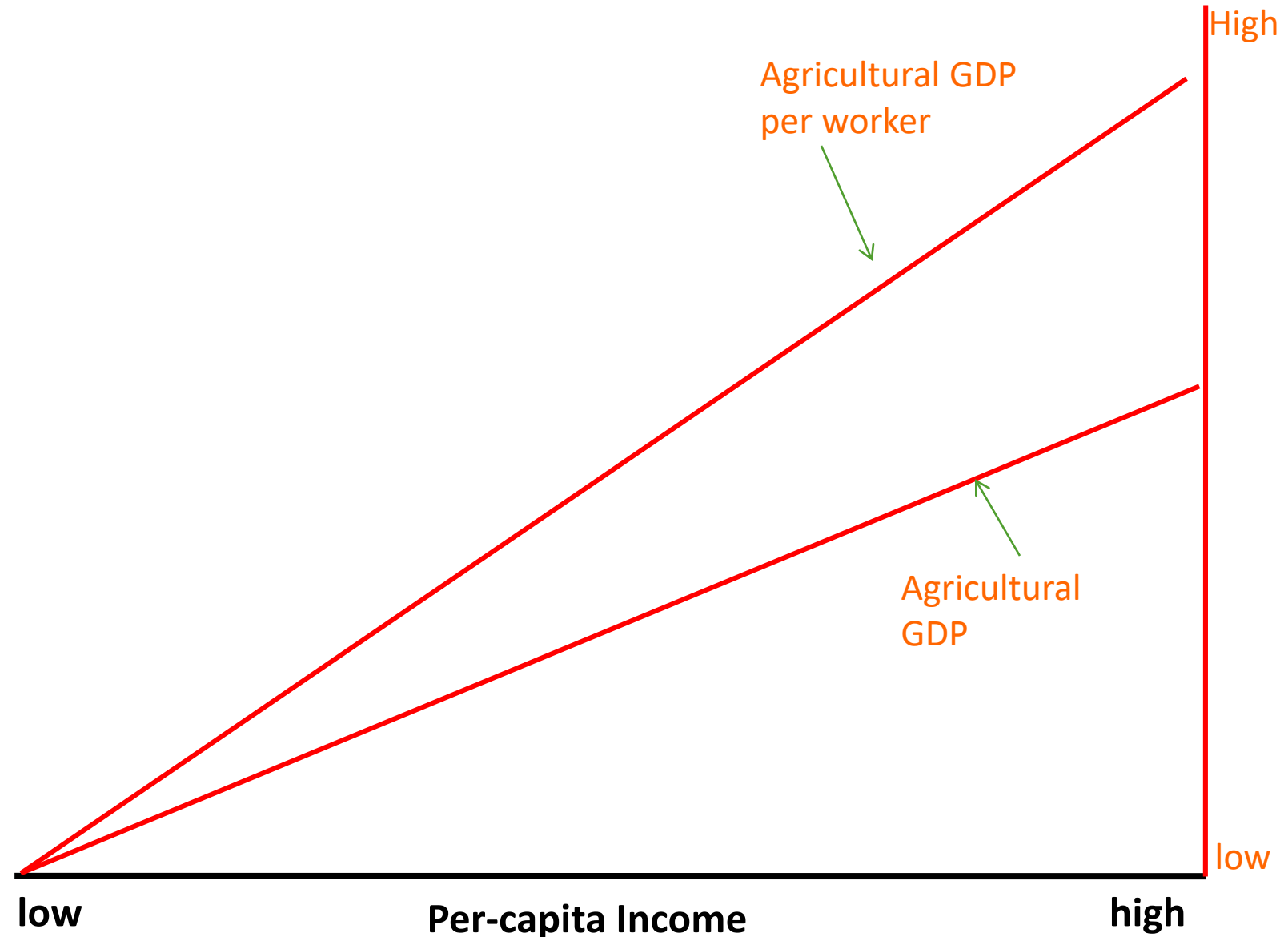




Outline

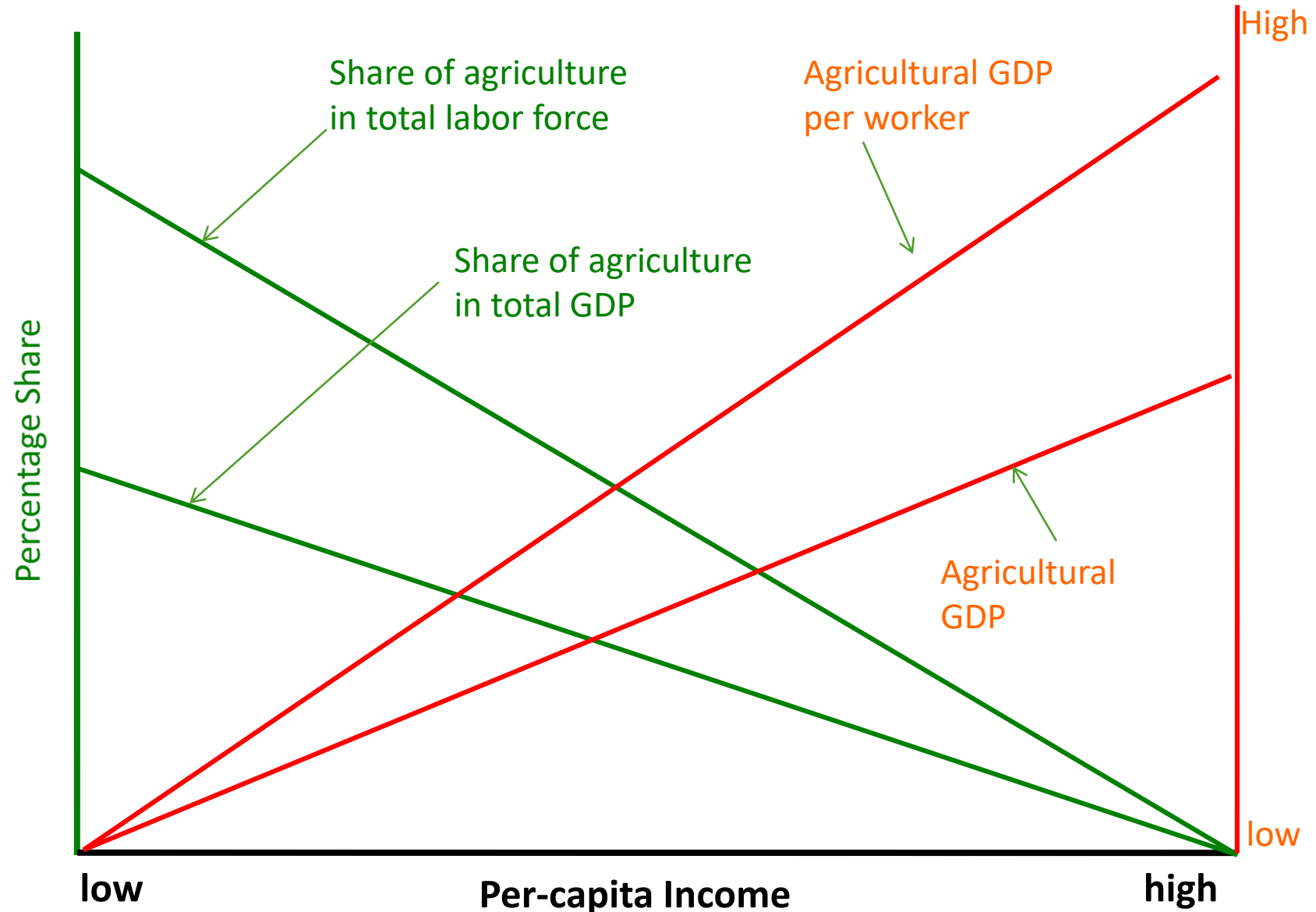
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AGRICULTURE IN THE ECONOMIC TRANSFORMATION PROCESS



Badiane (2014) based on Timmer (2009)

AGRICULTURE IN THE ECONOMIC TRANSFORMATION PROCESS

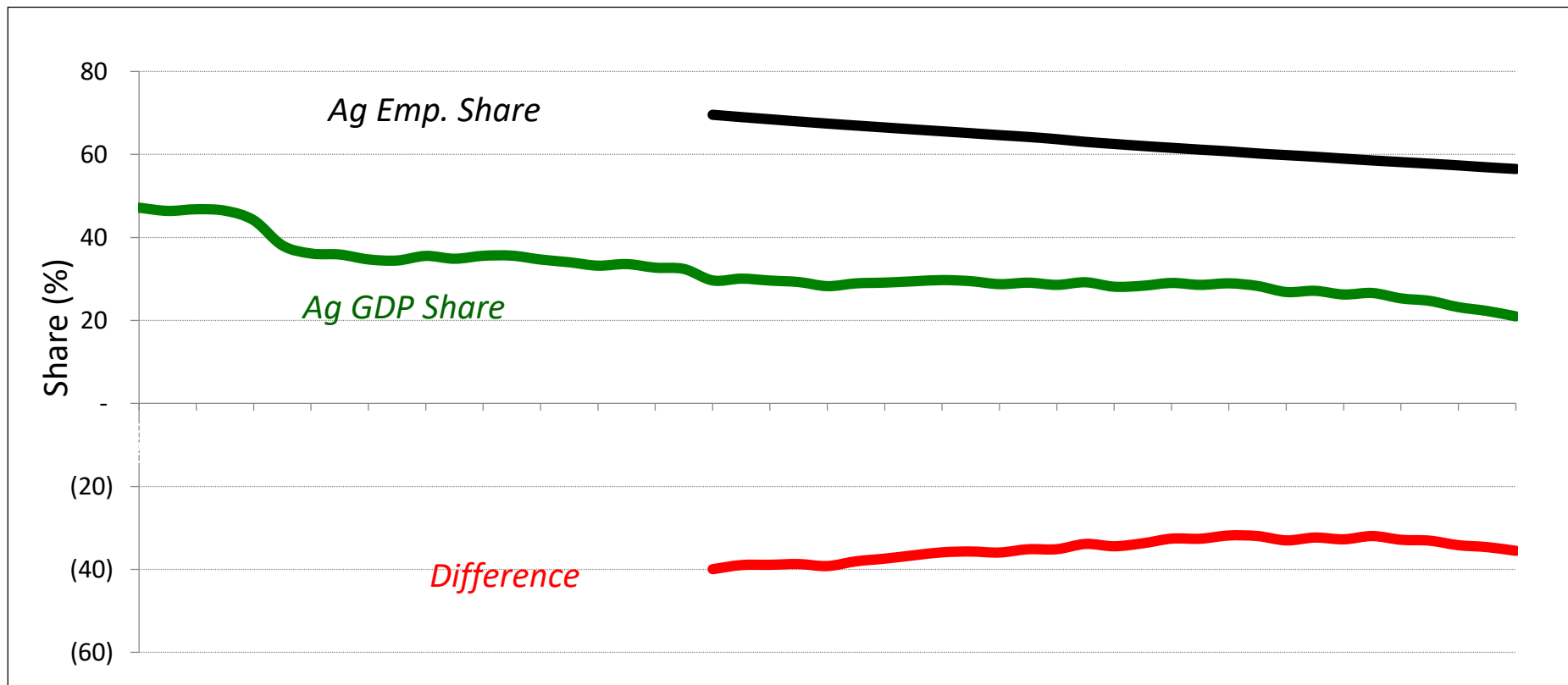


Badiane (2014) based on Timmer (2009)

HISTORICALLY SLOW TRANSFORMATION PROOCCESS IN AGRICULTURE

40 African Countries: 1960 - 2008

- ✓ Transformation process has been extremely slow
- ✓ Difference between Ag employment and GDP shares almost constant
➡ Stagnating Ag income + Rise in rural poverty



Source: Badiane (2014)



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MEASURING STRUCTURAL CHANGE

- ***WITHIN SECTOR GROWTH***
Increase in output per worker resulting from innovation and investments in factors of production in individual sectors
- ***STRUCTURAL CHANGE***
Increase in output per worker resulting from labor moving out of lower into higher productivity sectors

$$\Delta P_t = \sum_{i=n} \theta_{i,t-k} \Delta p_{i,t} + \sum_{i=n} p_{i,t} \Delta \theta_{i,t}$$

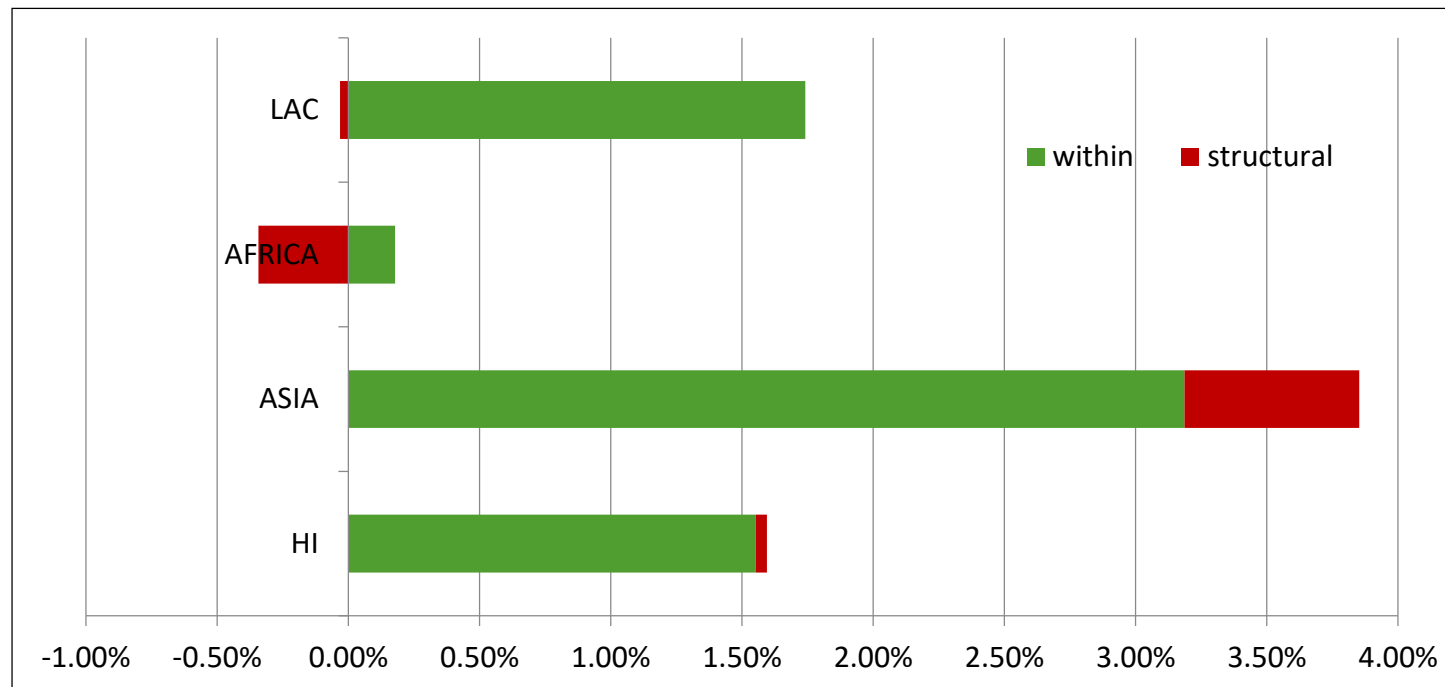
where P_t and $P_{i,t}$ refer to economy-wide and sectoral labor productivity levels, respectively, and $\theta_{i,t}$ is the share of employment in sector i . The Δ operator denotes the change in productivity or employment shares between $t-k$ and t .

PRODUCTIVITY REDUCING STRUCTURAL CHANGE IN AFRICA BEFORE RECOVERY PERIOD (1990-1999)

Transformation performance lags significantly behind other regions

- ✓ Within sector contribution positive but very low
- ✓ Structural change contribution negative and much larger

Decomposition of labor productivity growth: Africa vs other regions



Within Sector Contribution

$$\sum_{i=n} \theta_{i,t-k} \Delta p_{i,t}$$

Structural Change Contribution

$$\sum_{i=n} p_{i,t} \Delta \theta_{i,t}$$

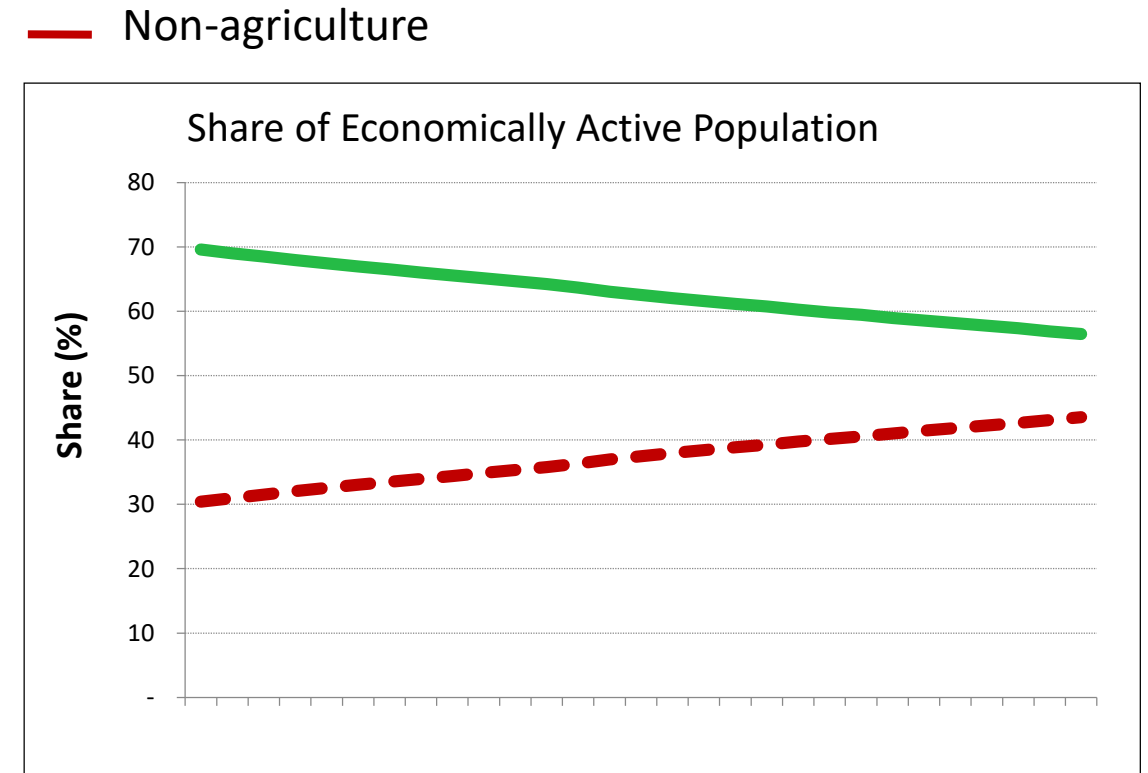
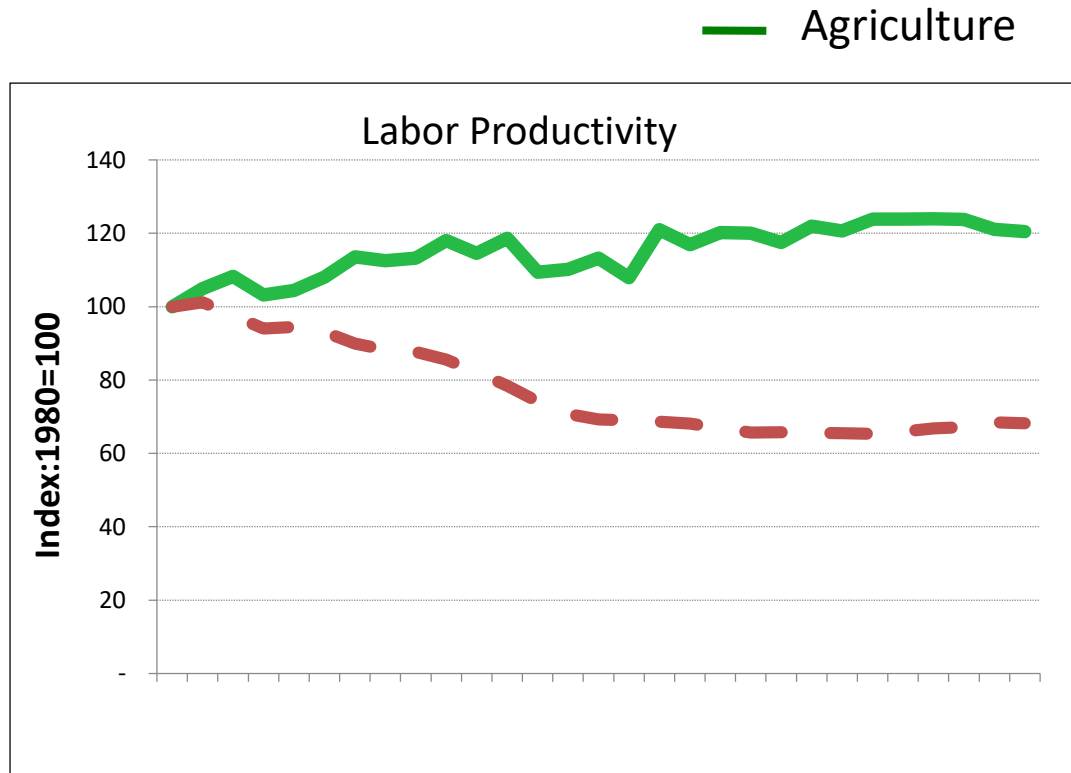
Source: Badiane and McMillan (2016)

STRUCTURAL TRANSFORMATION NOT DRIVEN BY FASTER PRODUCTIVITY GROWTH OUTSIDE OF AGRICULTURE

40 African Countries: 1960 - 2008

With stagnating agriculture:
Labor migrated to a non-agricultural sector
with rapidly declining productivity

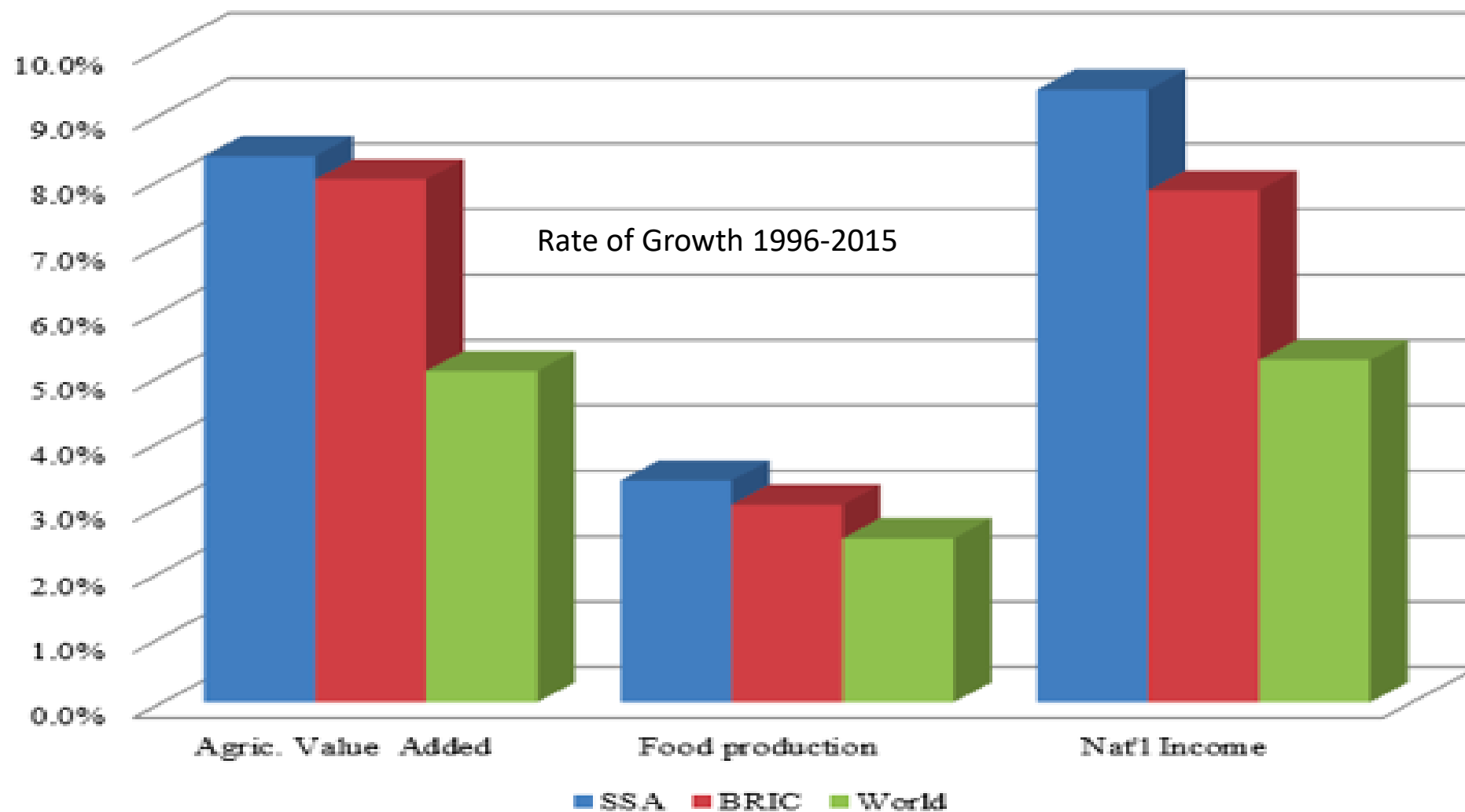
- ➔
- ✓ Decline in total labor productivity
 - ✓ Rising poverty rates



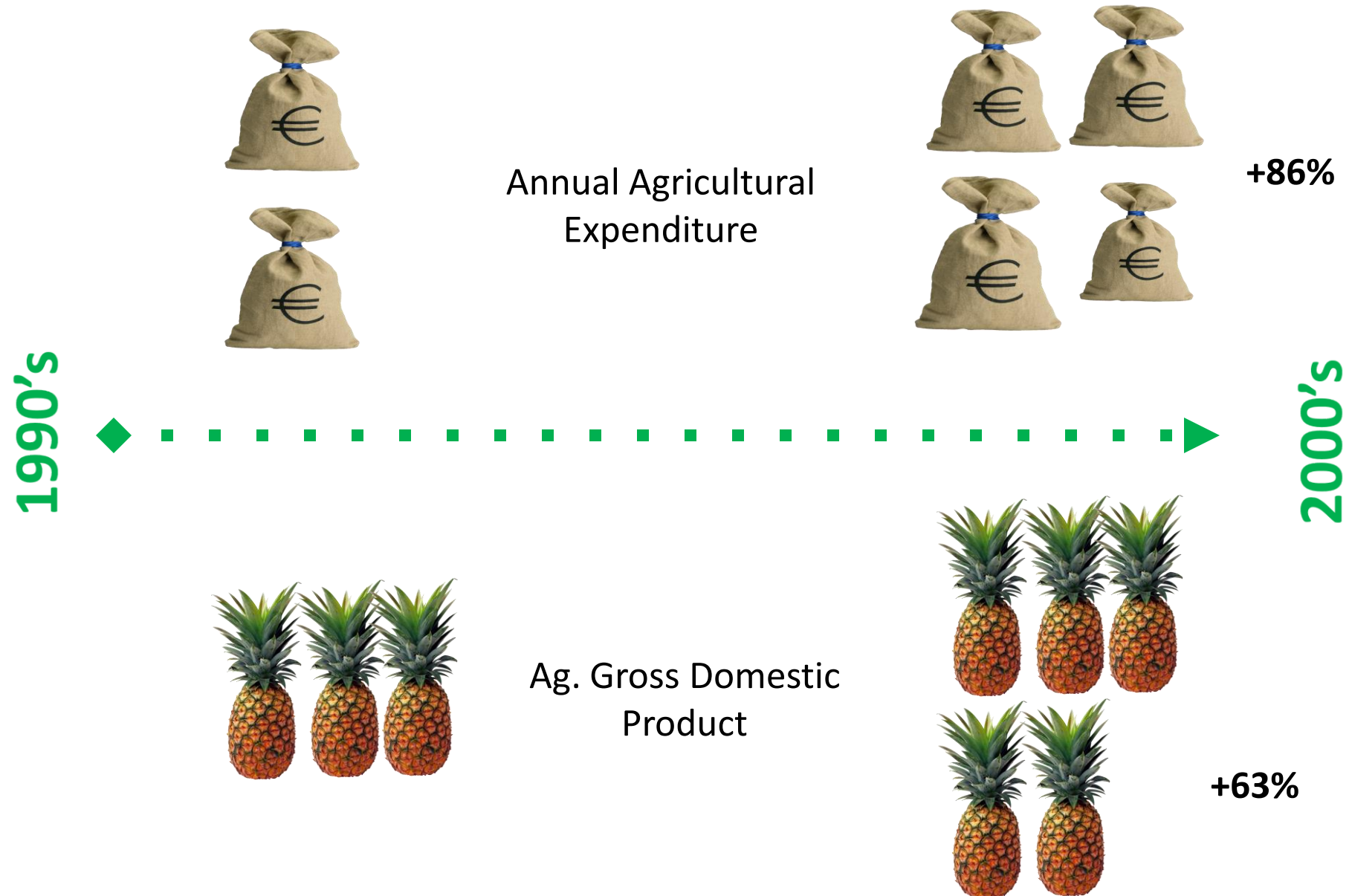
Source: Badiane (2014)

GROWTH RECOVERY IN AFRICA

Africa performed better than BRICs and world average in last 20 years



GROWTH RECOVERY IN AFRICA

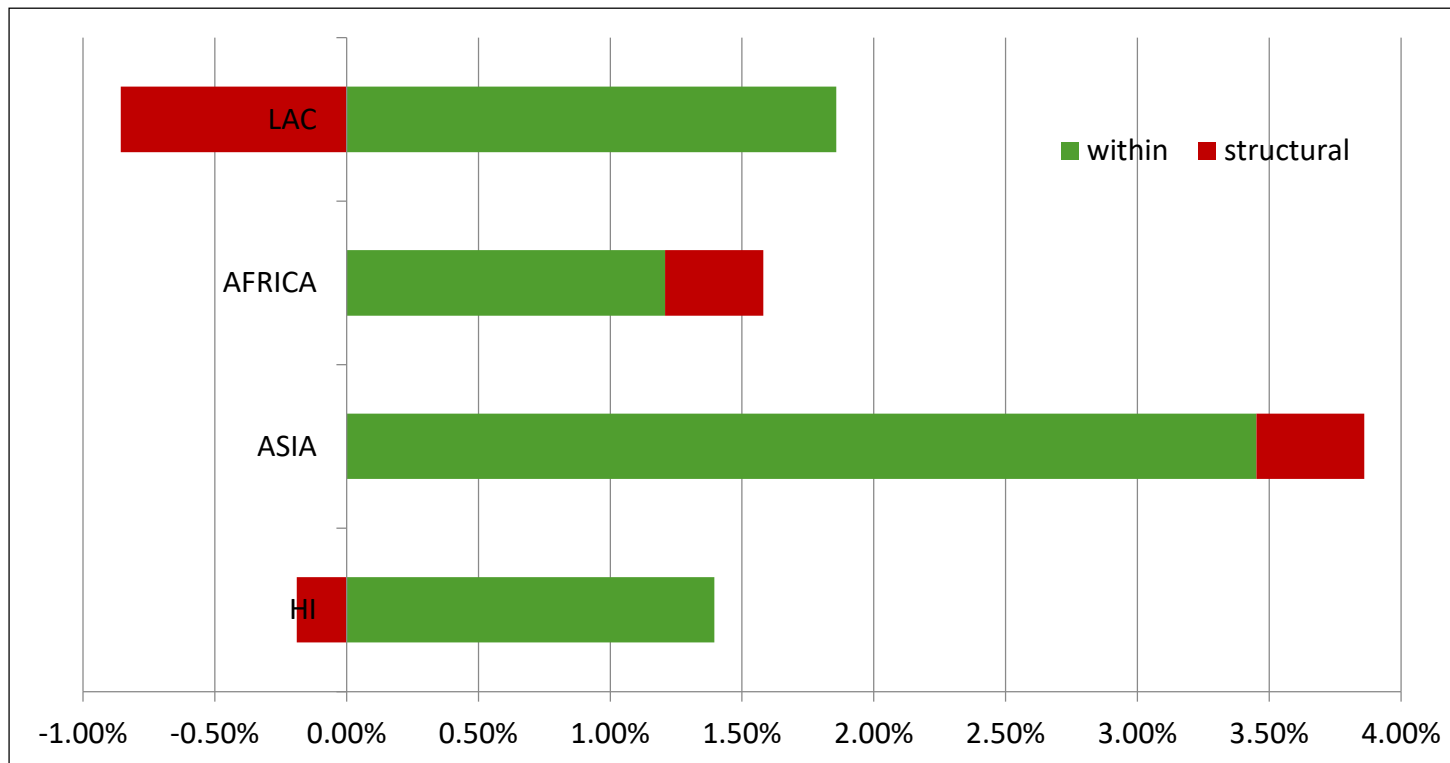


PRODUCTIVITY RAISING STRUCTURAL CHANGE IN AFRICA DURING RECOVERY PERIOD (POST 2000)

Transformation performance in Africa has improved markedly with onset of recovery

- ✓ Within sector contribution increased significantly
- ✓ Structural change contribution went from negative to positive

Decomposition of labor productivity growth: Africa vs other regions



Within Sector Contribution

$$\sum_{i=n} \theta_{i,t-k} \Delta p_{i,t}$$

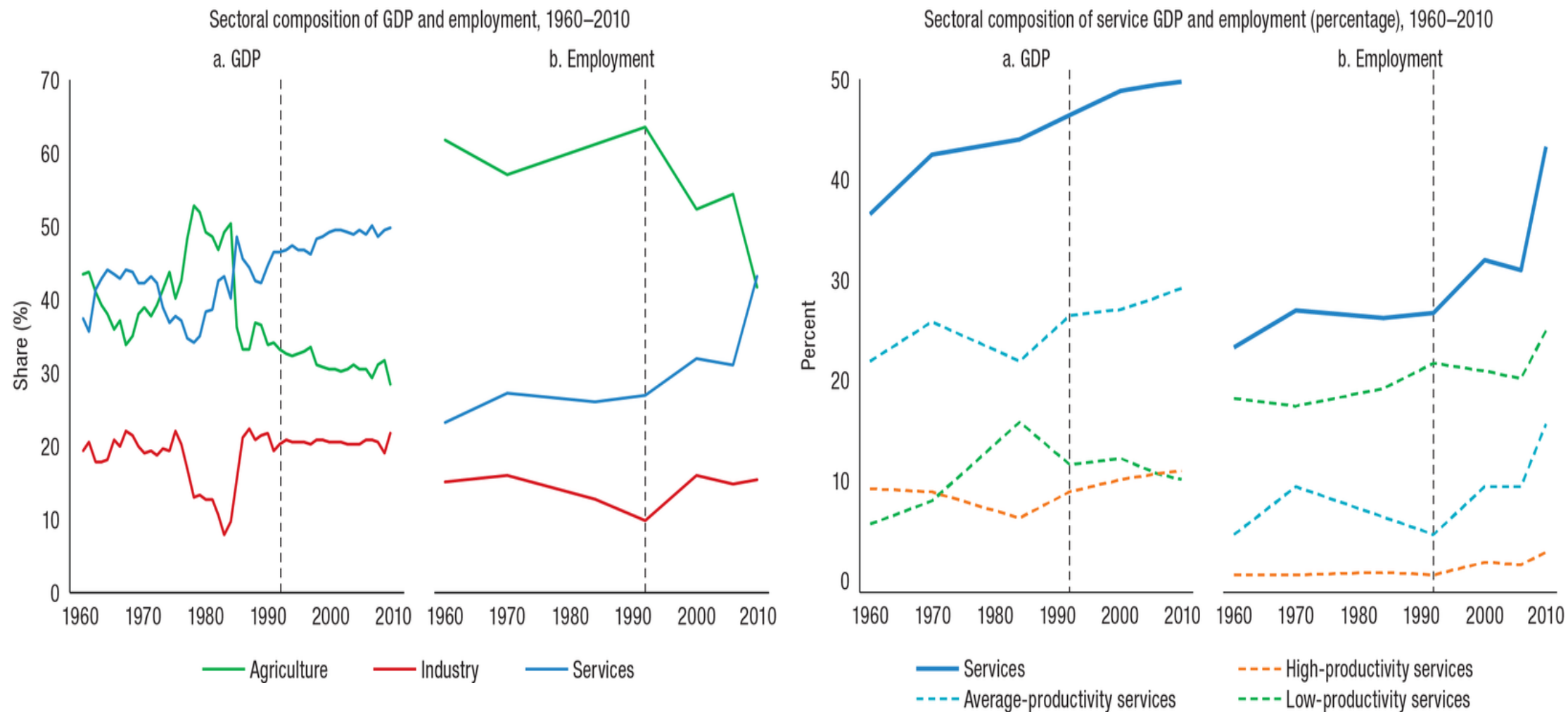
Structural Change Contribution

$$\sum_{i=n} p_{i,t} \Delta \theta_{i,t}$$

Source: Badiane and McMillan (2016)

STRUCTURAL CHANGE IN AFRICA IS BASED ON SERVICES, NOT MANUFACTURING

Example of Ghana



Source: Jedwab and Osei, in McMillan et al (2017)

IMPLICATIONS OF POOR STRUCTURAL TRANSFORMATION PRIOR TO RECOVERY (1)

- ✓ Informal goods and services sector (IGS) largest in African economies
- ✓ It is the largest pool of low productivity labor
- ✓ Includes large share of proto-industrial handicrafts and processing
 - *Wood, leather, metal works*
 - *Small mechanical and electrical parts*
 - *Garments and tailoring*
 - *Food staples processing*

IMPLICATIONS OF POOR STRUCTURAL TRANSFORMATION PRIOR TO RECOVERY (2)

- ➔ Traditional dual economy model of industrial policy based on agriculture vs industry no longer adequate
- ➔ It is also agriculture vs. services, hence a three-dimensional problem
- ➔ Industrial policy should also focus on modernization of IGS, including nascent agro-processing sector thru:
 - *Product sophistication*
 - *Firm maturation*
 - *Enterprise growth*



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DEMAND GROWTH AND THE SCOPE FOR AGROINDUSTRIALIZATION IN AFRICA

THE RISE OF PROCESSED FOOD SECTORS

Projected Demand Growth 2010 – 2040
(Estimated Purchased Food Budget Share in 2040)

	UNPROCESSED	PROCESSED LOW VALUE ADDED	PROCESSED HIGH VALUE ADDED
Non-Perishable	4x (8%)	5.5x (17%)	7x (23%)
Perishable	6.5x (20%)	8X (18%)	10X (15%)

Source: Tschirley, D et al. 2014.

RAPDIDLY TRANSFORMING REGIONAL VALUE CHAINS



1. TRADITIONAL MILLET VALUE IN SENEGAL

RAPIDLY TRANSFORMING REGIONAL VALUE CHAINS



2. MILLET BASED MEALS



RAPIDLY TRANSFORMING REGIONAL VALUE CHAINS

3. THE NEW MILLET VALUE CHAIN



HOME
BASED
MILLET
PROCESSING



READY TO COOK

MILLET PRODCUTS
ON THE SHELF

RAPDIDLY TRANSFORMING REGIONAL VALUE CHAINS

3. THE NEW MILLET VALUE CHAIN



HOME
BASED
MILLET
PROCESSING



READY TO COOK

MILLET PRODCUTS
ON THE SHELF



TRADITIONAL MILLET
BASED MEALS

RAPIDLY TRANSFORMING REGIONAL VALUE CHAINS

3. THE NEW MILLET VALUE CHAIN



HOME
BASED
MILLET
PROCESSING



READY TO COOK

MILLET PRODCUTS
ON THE SHELF



TRADITIONAL MILLET
BASED MEALS



READY TO EAT

MILLET
MEALS ON THE SHELF



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EMERGING AGRO-ALLIED INDUSTRIAL SECTOR

Profitability, Growth And Maturation

Current characteristics of regional agro-allied industries

- *Rising number of firms producing the same low quality, often imitated goods*



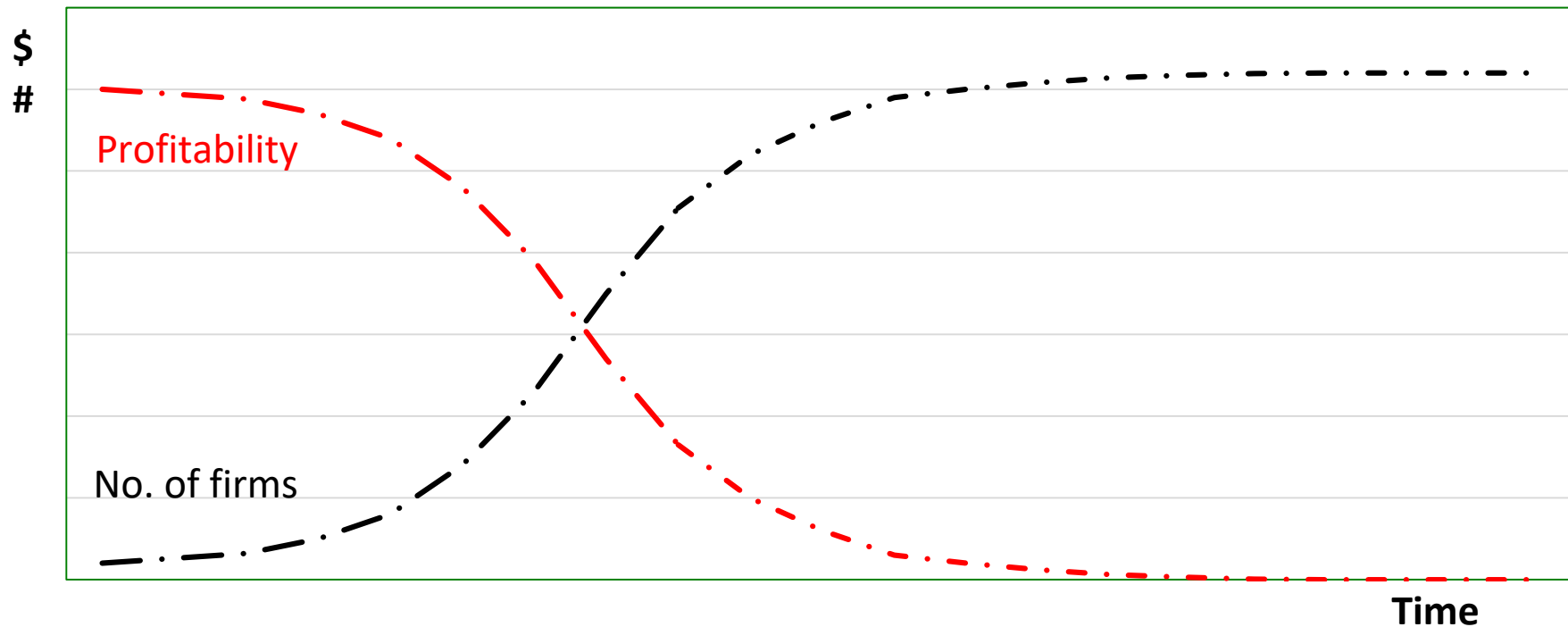
Source: Badiane, and McMillan. 2016; Based on Otsuka and Sonobe (2011)

EMERGING AGRO-ALLIED INDUSTRIAL SECTOR

Profitability, Growth And Maturation

Current characteristics of regional agro-allied industries

- *Rising number of firms producing the same low quality, often imitated goods*
- *As new entrants copy same products, profitability declines for everyone*
- *No capacity to invest and innovate; stifling firm growth and maturation*

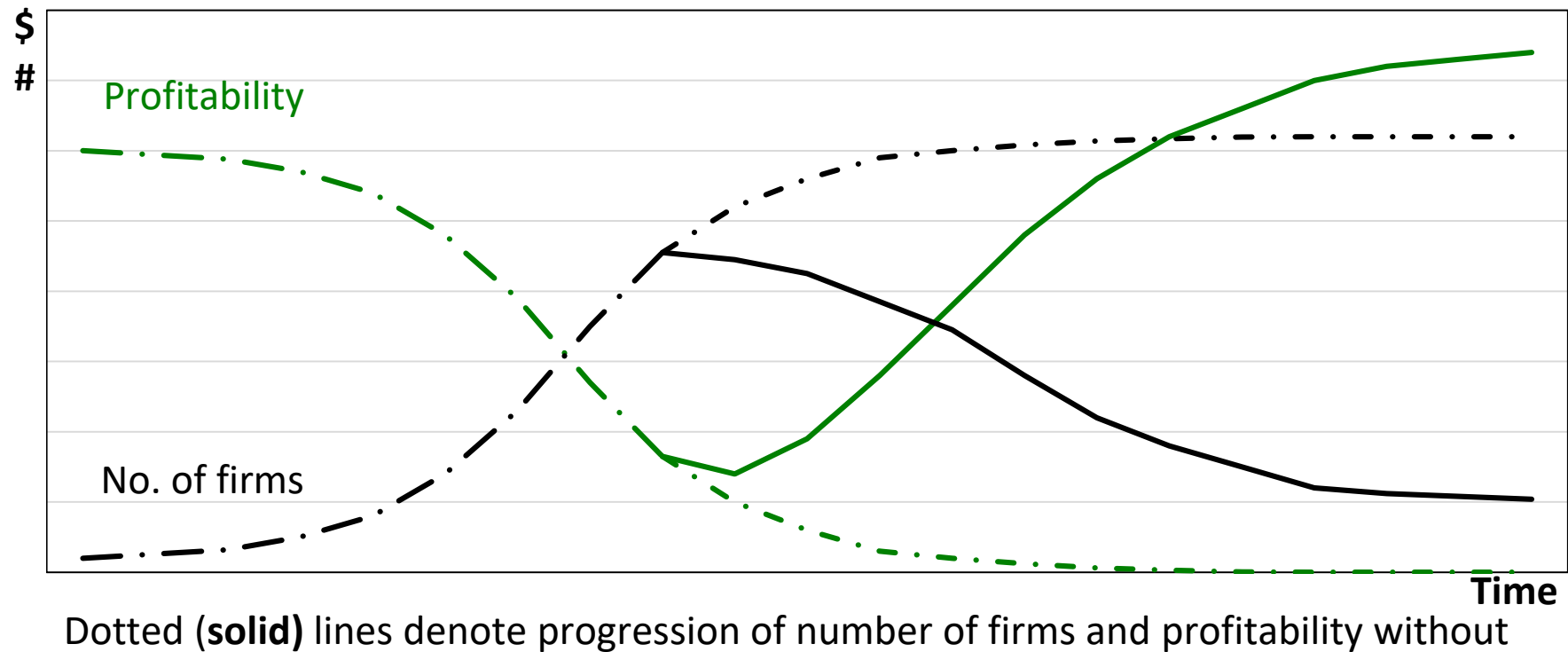


Source: Badiane, O. and M. McMillan. 2016; Based on Otsuka and Sonobe (2011)

AGRO-ALLIED INDUSTRIALIZATION STRATEGIES

Two Key Questions

How to bend the profitability curve and escape from low and declining profits?
How to promote enterprise growth through consolidation and specialization?

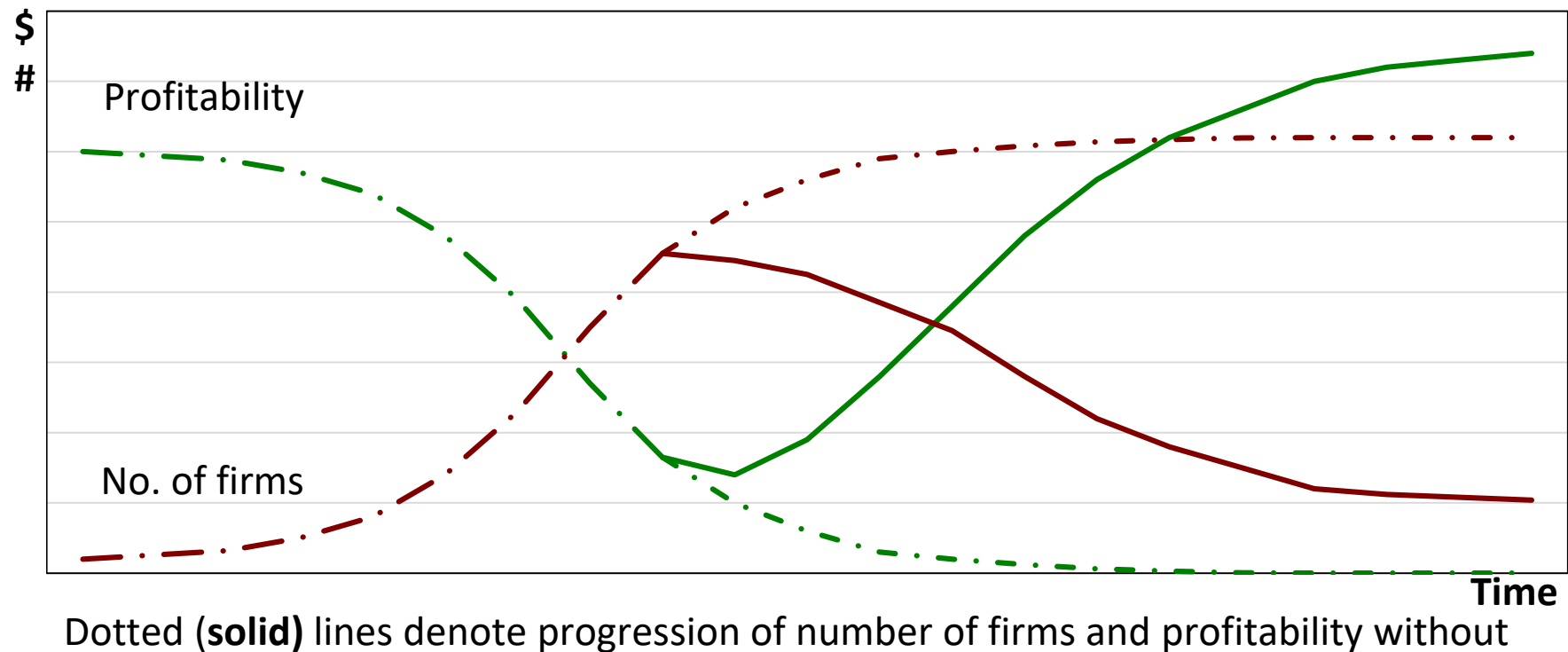


Source: Badiane, O. and M. McMillan. 2016; Based on Otsuka and Sonobe (2011)

AGRO-ALLIED INDUSTRIALIZATION STRATEGIES

Three Priority Areas for Policy and Investment

- A. **Process and product innovation:** Vocational training & Technology acquisitionⁿ
- B. **Market development:** Trade & competition policy, quality & standards
- C. **Cost of services and Infrastructure access:** Power, Telecom, Transport



Source: Badiane, O. and M. McMillan. 2016; Based on Otsuka and Sonobe (2011)

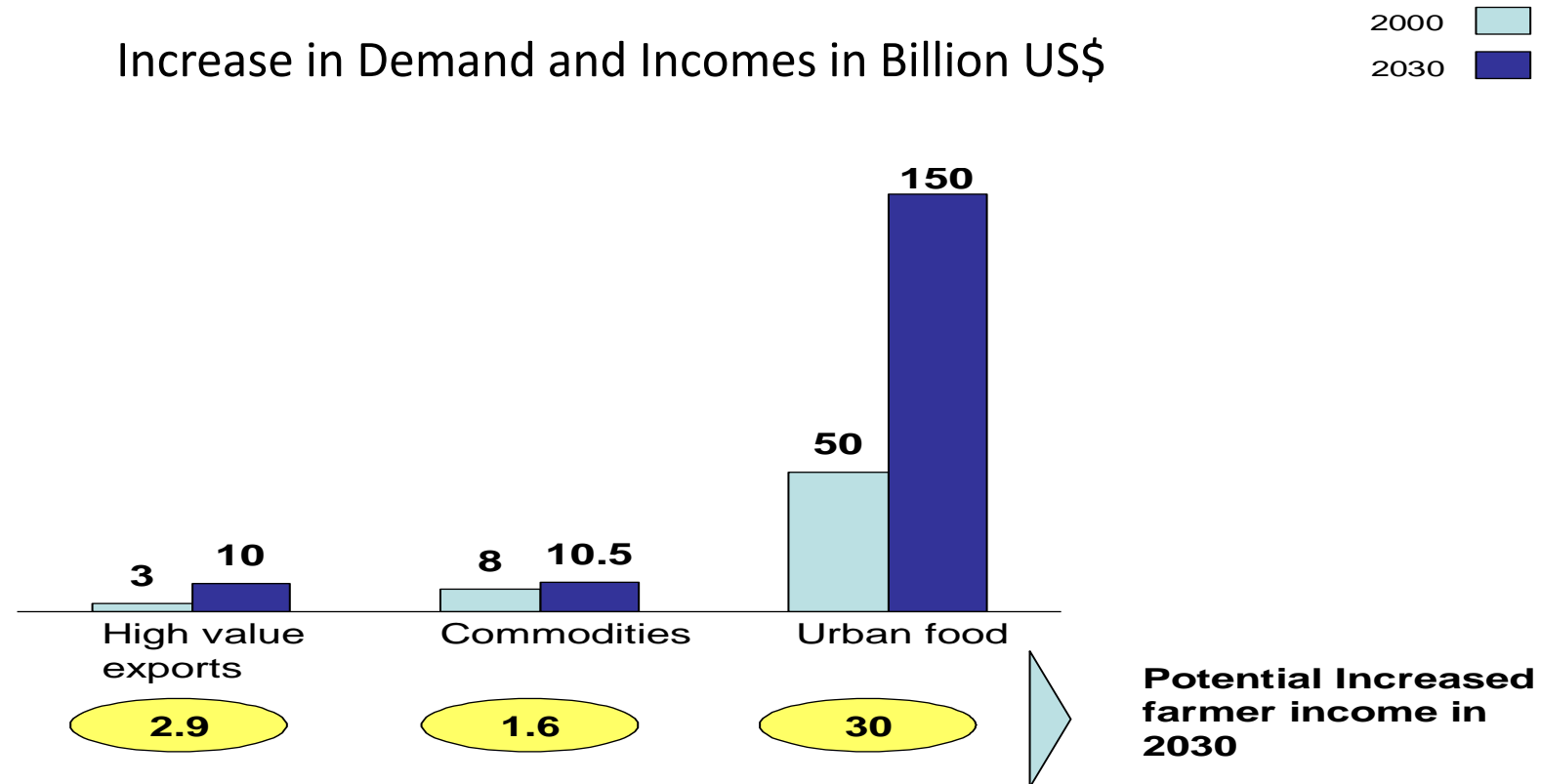
A. PRIORITY AREA 1: SKILLS DEVELOPMENT FOR PRODUCT AND PROCESS INNOVATION

Absence of professional & vocational training opportunities means:

- ① No skill upgrading for existing smallholder farmers
- ② No skill development for emerging value chain professions
 - Machine operations and maintenance
 - Processing technology skills
 - Product and process innovations
 - Management and sales
 - Packaging and distribution
 - Food quality and safety

B. PRIORITY AREA 2: TRADE & COMPETITION POLICIES FOR TRANSFORMING VALUE CHAINS

Regional Trade In Staples: Major Source of Future Income Growth



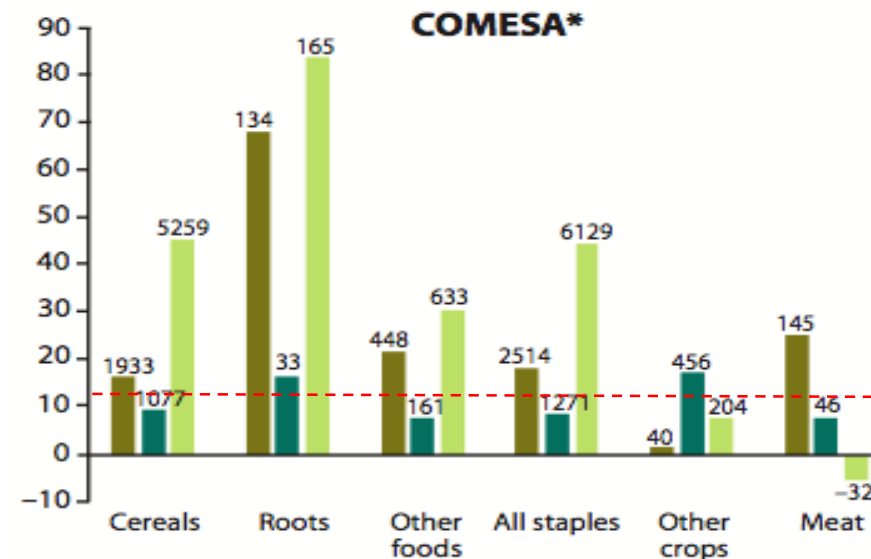
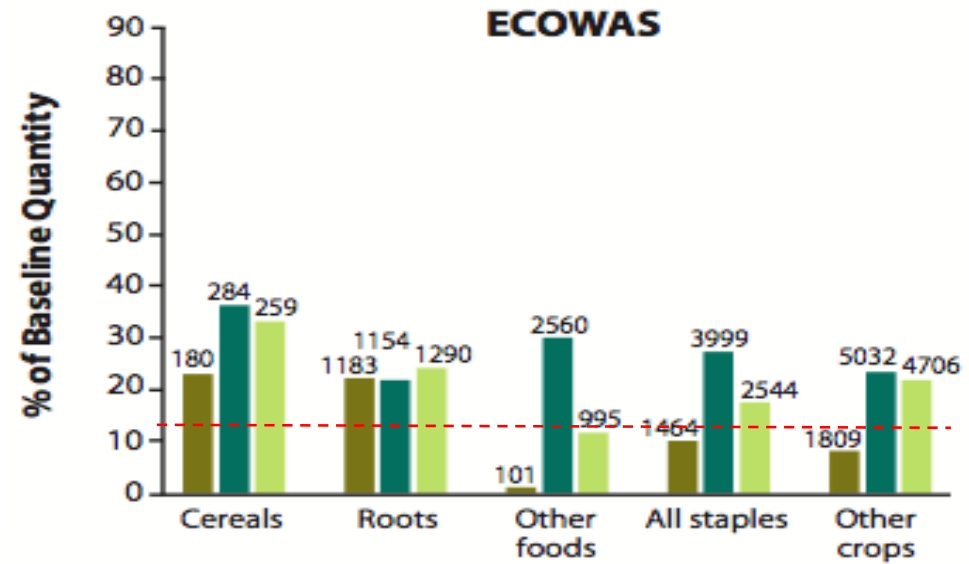
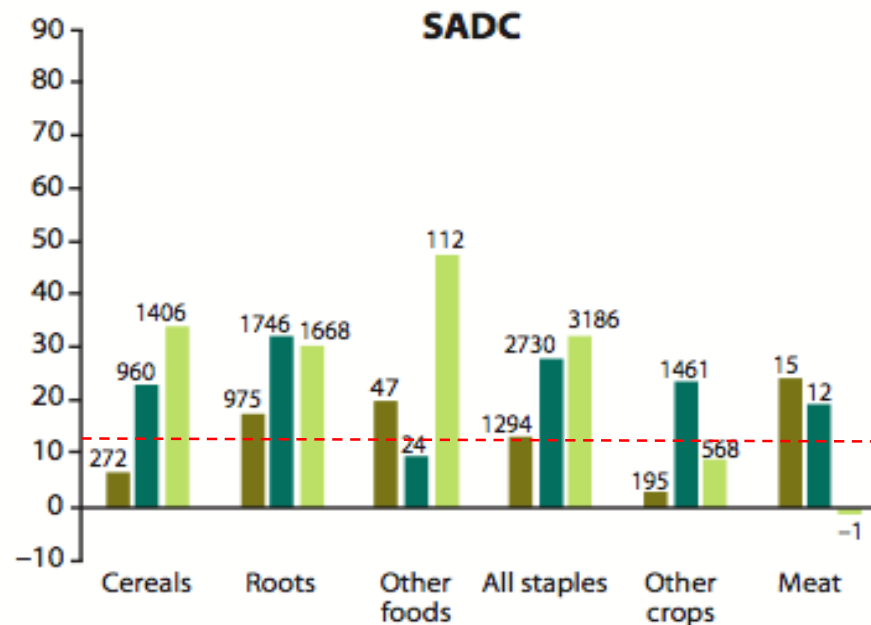
+ \$100B = Growth of staple food demand in urban markets in Africa

+ \$30B = Potential income for smallholder farmers

B. PRIORITY AREA 2: TRADE & COMPETITION POLICIES FOR TRANSFORMING VALUE CHAINS

Three policy options for competitive domestic value chains in regional markets

- 10% reduction in trading costs
- Removal of cross-border trade barriers
- 10% increase in crop yields



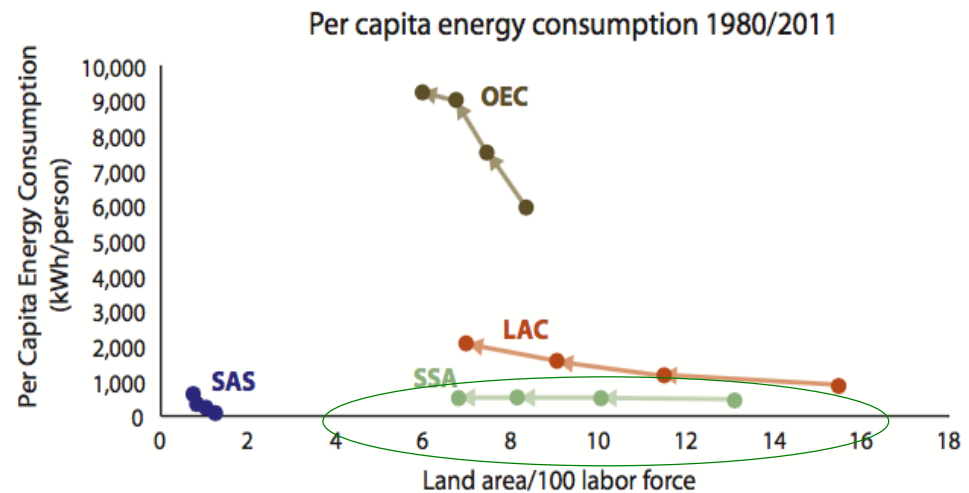
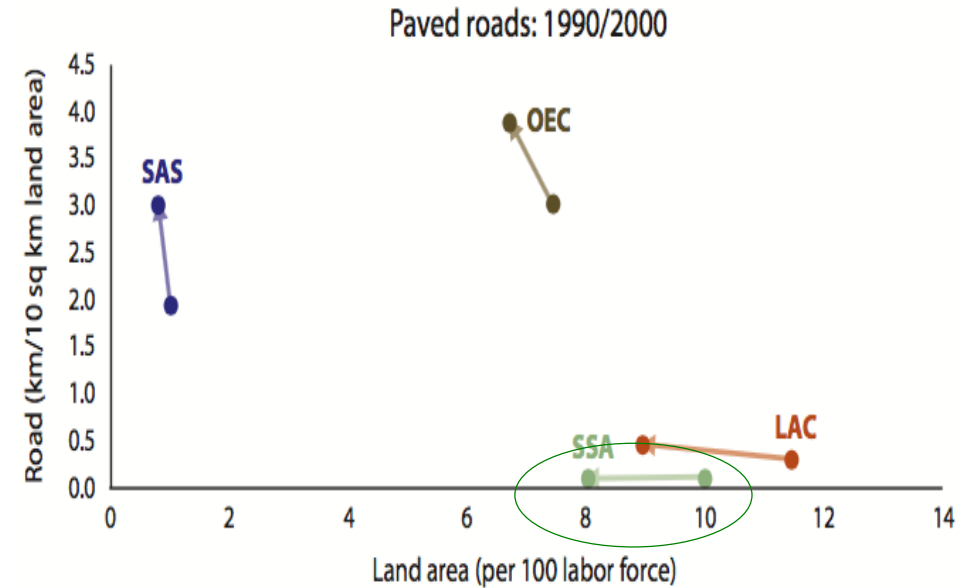
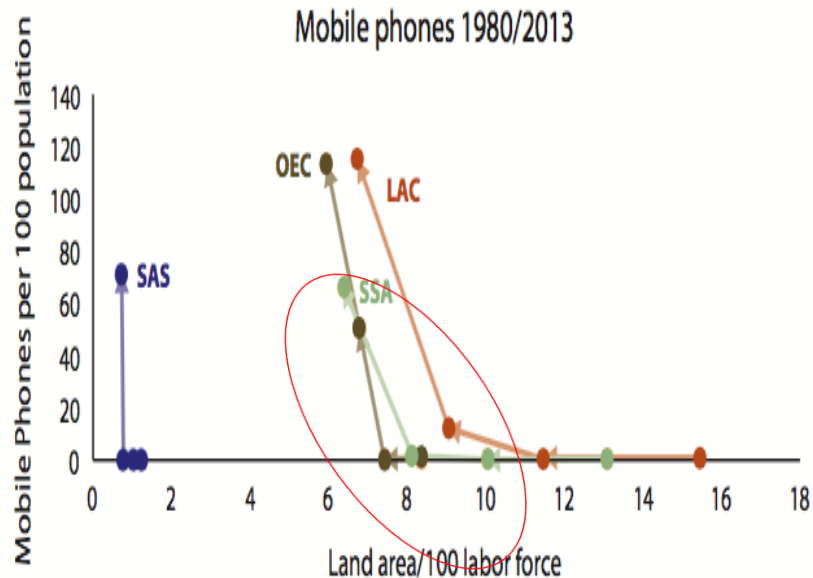
Notes: Notes: * COMESA+Tanzania. Figures on top of bars indicate cumulative increases in regional export supply in 1000 mt.

Source: Badiane et al. 2014

C. PRIORITY AREA 3: COST EFFECTIVE INFRASTRUCTURE SERVICES

Harness ICT for Quick Gains

- ❑ Africa's infrastructure gap is lowest in the Telecom Sector
- ❑ While investing in power and transport infrastructure
- ❑ Tap into Modern ICT to leapfrog



USING ICT TO INNOVATE, CUT COST AND GO TO SCALE

How ICT can be leveraged for smallholder agriculture

① Lower cost of overcoming physical and institutional obstacles

- Bridge the distance to millions of dispersed smallholders
- Extend the reach of limited technical staff

② Lower cost of access to technology and services

- Tap into global knowledge networks
- Enable self-learning and peer-to-peer learning

③ Link smallholders to other value chain operators

- Traders, exporters, processors
- Financial services providers
- Technology services providers

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