The Role of Agriculture in African Development

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I. Agriculture in Africa: Background
Agriculture Shares of Employment and Output

- In many African countries, especially south of the Sahara, large fractions of the workforce are employed in agriculture
  - 60% for sub-Saharan Africa in the aggregate
  - Some countries 70-80%

- Agricultural sector appears to have low productivity, relative to non-agriculture.
  - GDP shares are systematically far lower than employment shares.
Agriculture Shares of GDP and Workforce

Figure: Agriculture shares in developing countries
Implications of the Raw Data

- Arithmetically, these data seem to suggest that value added per worker \( \frac{VA}{L} \) is lower in agriculture than in the non-agricultural sector.
- The implied productivity gaps are large.
Agricultural Productivity Gap

- In a paper jointly authored with David Lagakos (UCSD) and Michael Waugh (NYU), we define the Agricultural Productivity Gap (APG) to be
  \[ APG \equiv \frac{V_{A_n}/L_n}{V_{A_a}/L_a} \]
- Simple two-sector model says APG should be 1.
- Typical developing country has APG of 4.
- Some (particularly in sub-Saharan Africa) have APGs of 8 or more!
We consider the possibility that these large APGs are due to mismeasurement.

We make adjustments for:

- Differences across sectors in hours worked.
- Differences across sectors in human capital per worker.
- Differences in costs of living between rural and urban areas.

We consider micro data sources as well as macro aggregates...

Bottom line: APGs shrink under careful measurement but remain substantial.
APGs: Raw and Adjusted
A Ricardian Puzzle

- Ricardian comparative advantage suggests that countries should specialize in sectors that are relatively most productive, compared to the rest of the world.
- Why are so many Africans working in agriculture – a sector where they appear to be relatively so unproductive?
- In a mechanical sense, these high APGs appear to “explain” much of cross-country disparities in GDP per worker.
- Are they evidence for misallocation?
- What are the policy implications?

Agriculture in Development Strategies?

- In particular, these APGs raise questions about the role of agriculture in development strategies.
- Should African countries invest in a sector with (very) low relative productivity?
  - To raise sectoral productivity?
  - To achieve growth?
  - To reduce poverty?
  - For food security?
- Do these different goals imply different priorities for investment?
- Should investments instead focus on other sectors, with the goal of leaving agriculture to shrink further?
II. Is Agriculture Special?
Why Focus on Agriculture?

- Why focus on agriculture at all?
- The fact that “lots of people work in agriculture” is not by itself a justification for investment...
  
  ▶ We need to know also that investments in this sector lead to desirable development outcomes.

- Rationale needs to be more tightly articulated.
- Perhaps not helpful to think of agriculture as a homogeneous sector.
- Different investment strategies, with different goals, may be appropriate for different portions of the sector.
- Strategies for agriculture must focus on what makes agriculture distinctive.
How Is Agriculture Different from Other Sectors?

- Many sectors employ lots of poor people and produce goods that people need.
  - Housing and construction
  - Health care
  - Clothing

- What is special about agriculture?

- Two things (at least):
  - Agriculture is the only sector that produces the raw materials for food.
  - It is a sector that uses land on a large scale.
Why Does Space Matter?

- Food is physically large and heavy.
- It can be quite perishable.
- It needs to be moved from place to place.
- Implications:
  - Spatial distribution of people across the landscape matters.
  - Transport costs matter.
  - Markets for food may be very segmented, poorly connected, highly heterogenous.

Food security is strongly linked to spatial heterogeneity as well as to social, cultural, and economic factors.
Spatial Heterogeneity and Markets

- Global food markets are not universally well integrated.
- High integration between major ports
  - Low transport costs
  - Low and declining trade barriers (tariffs and non-tariff barriers)
- Different picture within developing countries, especially those with poor infrastructure.
  - Poor roads and differentiation in dietary patterns leads to big price differences across locations.
An Example: Uganda

- Rural households are frequently remote:
  - Three-quarters live more than two hours from a market center.
  - One-quarter live more than five hours from a market center.

- Average distance to a health clinic was 7 km (including in cities); 77 percent of people report that they walk to get to clinics.
Transportation

- Roads are very bad, especially in rural areas.
Transportation

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Road near Mpanga River, Fort Portal, Uganda. Photo: Rebecca Kaduru.
Transportation

- Measured transport costs are very high, and price wedges between different markets appear to be extremely high.

- The cost of moving 100 kg of agricultural goods 100 km was as high as $5.43 (trucking matoke from Mbarara to Lira), compared with $0.573 for corn in the US.
Low Productivity Transport Technologies

- Because the roads are poor, much transport is done on a very small scale with relatively unproductive technologies.
- Goods are head-loaded or carried on bicycles for substantial distances.
- Spoilage rates are high, especially for perishable goods but even for grain.
Other Forms of Heterogeneity in Agriculture

- Spatial heterogeneity is only one dimension that matters for the impact of world prices.
- Different households consume different foods, work in different occupations, and have access to different resources.
- Differences in ethnicity, gender, land endowments, off-farm opportunities, location... etc.
III. Agricultural Development Strategies for Africa
Where Does Agriculture Fit in African Development?

- Heterogeneity also matters for African development strategies.
- Intense debates taking place in policy circles over issues such as:
  - The role of large farms vs. small farms
  - Staple food crops vs. cash crops
  - The potential use of genetically modified crops and livestock
  - Efforts to promote greater use of inputs
- These are all important topics for discussion, but we should recognize that the answers will be highly context-specific.
Agriculture as a Key Sector

- One view sees agriculture as the key sector for growth and poverty reduction.
  - Many poor people are found there.
  - The sector produces a good that is disproportionately important for the poor.
  - Achieving growth in agriculture has large benefits for the overall economy and for poverty reduction.

- Technological improvements in agriculture have the potential to disseminate cheaply over large geographic and social spaces.

Agriculture as a Trailing Sector

- Another view sees agriculture as a problem sector.
- Agricultural productivity is low.
  - Should countries specialize in a sector where they are remarkably unproductive?
  - Growth in productivity does not lead to income gains for farmers unless there is also effective demand.
  - Productivity gains in agriculture can be very difficult to achieve and may take a long time.
- Why devote more resources to a sector that is declining in importance in Africa as elsewhere?
Heterogeneity, Again!

- Answers to questions of development strategy will surely not be the same in all countries.
  - Collier typology: coastal, landlocked, and resource-rich countries will face very different challenges.

- Within countries, big difference also...
  - Many countries have remote rural areas with many people living from quasi-subsistence agriculture.
  - Most countries also have dynamic peri-urban areas where commercialization is underway.
  - Some countries have large tracts of land for large-scale mechanized agriculture.

- Implies a mix of policies and strategies (a boring answer, perhaps, but true)
But perhaps we should also reflect on the immodesty of the idea that there are “development strategies” that countries should follow.

Presupposes that the state can/should make these choices based on technocratic recommendations.

Not a good description of food/agriculture policy anywhere in the world!

Instead, ask:

▶ How will changing technologies and market opportunities alter the patterns of agricultural development?

Are “strategies” important?
Designing Interventions

Nevertheless, some clear issues for the development community in designing interventions:

▶ Should we focus on food production or income generation for rural households?
▶ How much location specificity is there in development interventions?

▶ How effectively can we target interventions?
  ▶ Is it possible to target interventions to resource-poor farmers, women, those in remote and marginal areas?
  ▶ Will technologies that benefit targeted groups also benefit larger and more commercial farmers in favorable areas?
  ▶ If so, is it a problem?
  ▶ What is the cost-effectiveness of interventions aimed at different (perhaps narrowly defined) targets?
A Call to Research

- Many unanswered questions – including hugely important ones.
- Self-serving but true to suggest that we need more research!
- Surprisingly little evidence about fundamental questions related to food and agriculture in development.
  - Needs for researchers across / within / between disciplines.
- Need for a new generation of researchers, bringing different concerns and methodological approaches than their predecessors.
- Understanding of development processes will increase dramatically over the decades ahead.