

Agriculture for development revisited: Inducing transformations

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1. Potential and support for Ag-based development strategies

- Ag can have a major role to play for development in “ag-based countries”, mainly low income SSA and SA (WDR 2008)
 - Strategy has been **effective** for many countries now middle-income: China, Vietnam, Indonesia, Chile, Brazil, Guatemala...
 - **Current** role of Ag for growth in SSA confirmed by Page (Brookings) and Stiglitz (WIDER) in context of weak industrialization (Rodrik) and weak urban-based ST
 - **Success** with Ag-based growth currently observed in several SSA countries: Ethiopia, Rwanda, Ghana
 - But **under-investment** in Ag in most SSA countries relative to CAADP 10% standard of public expenditures (Goyal & Nash)
 - **Low adoption** of fertilizers, improved seeds, and high value crops: SSA agriculture continues to **lag behind** in spite of rapidly increasing food imports and world market opportunities
- **Puzzle of under-investment in Ag for Development**

Objective of presentation

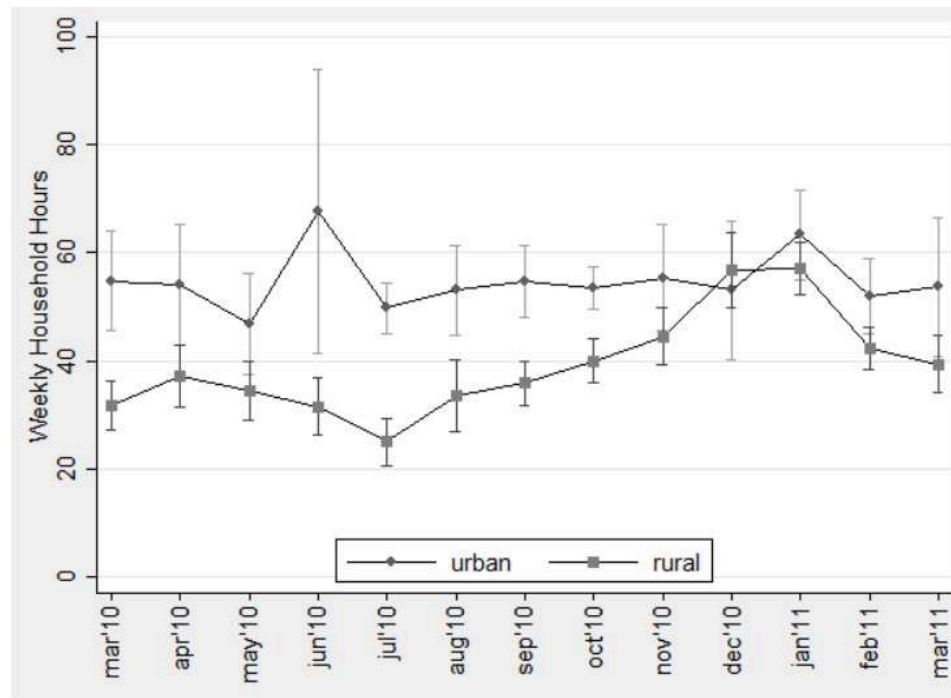
Sketch a **comprehensive strategy** to use agriculture for development based on TFP growth to induce agricultural, rural, and ultimately structural **transformations**

Outline of presentation

- 1. Potential and support for Ag-based development strategies*
2. The centrality of TFP growth: Harvesting Prosperity (WB)
3. How to use Ag for development? A cumulative strategy
4. Two approaches: constraint removal and VC development
5. Results from research on removing constraints to adoption
6. Value chain development for high(er) value crops
7. Results from research on VCD and inclusiveness
8. Some research results on the cumulative strategy
9. Questions for research
10. Conclusions

2. The centrality of TFP growth: Harvesting Prosperity

- Major price and exchange rate **distortions** (Krueger-Valdés-Schiff) have now been removed (Kim Anderson)
- Low **intra-farm allocative inefficiencies** continue to prevail given context: TW Schultz “poor but efficient”
- Observed **productivity differences** across farms mainly due to heterogeneity of circumstances and data measurement errors rather than differences in farmer ability (Gollin and Udry).
→ Hence low expected gains from land reallocation across farms and farmers
- Implication is that successful Ag growth depends principally on **TFP growth**, hence on R&D and widespread adoption: this is the thesis of the WB’s **Harvesting Prosperity** report
- Also, TFP differences also due to **labor calendars** for rural households:



Urban and rural households' labor calendars in Malawi (LSMS-ISA)

- Labor engagement equal between rural and urban at peak Ag time (Dec-Jan), but **off-peak idleness** a major cause of low annual TFP and rural poverty
- **Labor productivity** not very different between urban-rural when people work
- Most non-agricultural labor absorbing activities **not countercyclical** with Ag: on/off-farm **specialization** of household members rather than job switching
 → Hence key role of more complete farming systems/labor calendars (**Ag Transformation**) and rural non-farm incomes (**Rural Transformation**)

3.How to use Ag for development? A cumulative strategy

(China, Jinkun Wang; IFAD 2016 Rural Development Report; IFPRI; FAO)

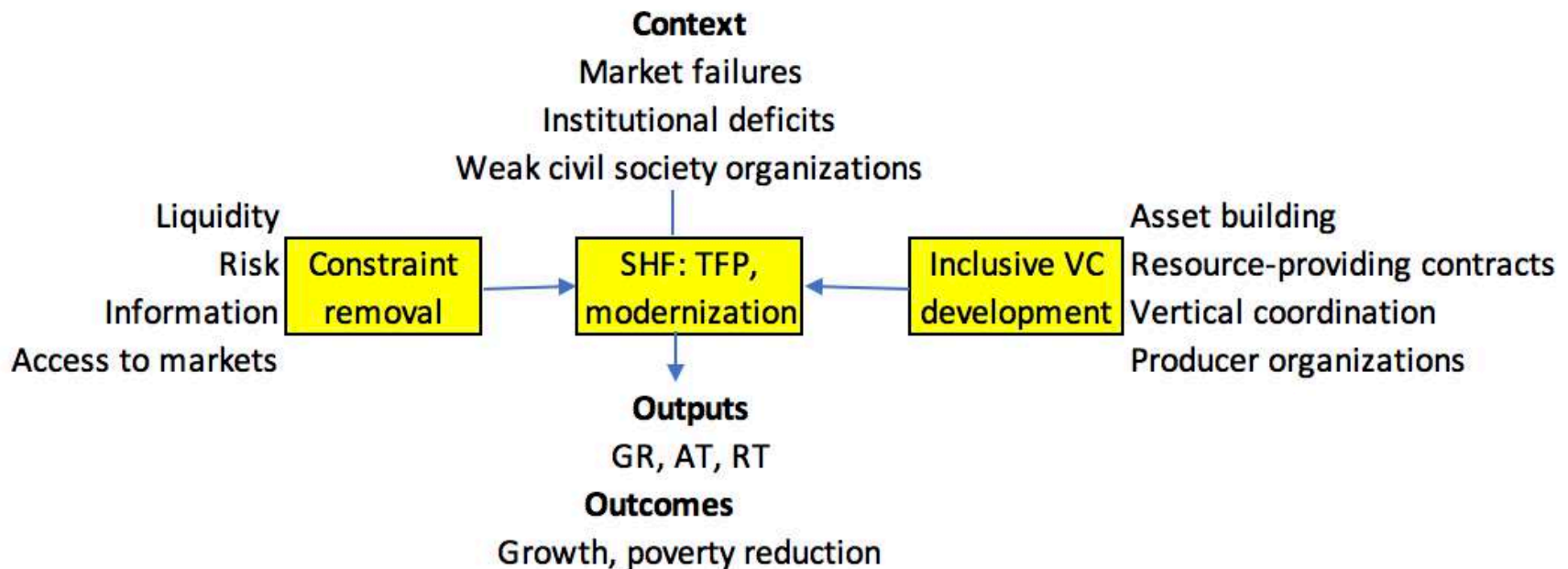
Five levels:

- **Establish pre-conditions to Ag growth:** land security, minimum asset endowments (Eswaran and Kotwal; BRAC graduation model), R&D and extension, infrastructure, Doing Business context for rural SME
- **GR:** TFP growth in staple foods based on seed and fertilizer adoption (AGRA). Still to reach most **rained** areas.
- **AT:** diversified farming systems with higher value crops/ animals, more complete labor calendars, and value chain development (VCD) inclusive of SHF

- **RT**: employment and incomes in a local **Rural Non-Farm Economy** pulled by TFP growth in agriculture through forward, backward, and final demand linkages (Adelman's **ADLI**, **ADLS**). Development of a rural SME sector and rural urbanization (Christiaensen). Development of mechanization and of labor and land rental markets to allow land consolidation. Rural human capital improvement for production of high-value crops and employment in the RNFE. Policy reforms to eliminate discrimination urban vs rural areas.
- **ST**: Successful GR/AT/RT as a contribution toward ST
→ Hence, AT/RT strategy goes **beyond** the traditional Jorgenson/Lele-Mellor TFP growth in Ag in support of **urban-based industrialization and ST** through labor transfers and cheap food for urban workers (dual economy models, Timmer)
→ **Transformations give a new perspective on using agriculture for development**

4. Two approaches to TFP growth and transformations: constraint removal and value chain development

- **Remove constraints to adoption** toward GR: Largely supply-driven technology and modernization (ATAI 1)
- **Develop inclusive value chains** toward AT/RT: More demand-driven technology and modernization (ATAI 2)



Theory of change for GR/AT/RT

5. Results from experimental research on removing constraints to adoption under ATAI1

- **Main constraints** originating in market failures and state deficiencies: liquidity, risk, information, access to markets (Bridle, Magruder, McIntosh, 2019)
- Experimental research leads to major **institutional innovations** to overcome each of these constraints: e.g., nudges to savings, social capital in lending, index insurance and emergency loans, extension entry points in social networks, quality recognition on markets, information and trading on market platforms, etc.
- **But low adoption remains**, with typical ceiling (say 30%) associated with heterogeneity and low profitability for majority (need complementary inputs, customized technologies)
- **Customization** with heterogeneity creates a major problem with scale and cost effectiveness in delivering technological support: is there an irrigation-customization tradeoff? Role IT

6. Value chain development for high(er) value crops

- **Higher value crops** can be quality improved staples. More likely F&V, vegetal proteins (key for **mitigation** of climate change), animal products, cash crops
- **Elements of inclusive VC Development:**
 - **Private sector entrepreneurship:** lead VC agents and thick middle sector (Reardon; Touré)
 - **Coordination** in VC for private and public/club goods investment (Torero)
 - **Contracts** to overcome market failures: resource-providing, productive alliances (WB)
 - **Support institutions** to assist SHF decision-making and business capacity: One Acre Fund, Digital Green, Syngenta
 - **Producer organizations** for discipline, scale, market power
 - **Social protection** (formal and informal) to help SHF take risks and protect against covariate shocks

7. Results from research on VCD and inclusiveness

Eight ingredients:

- (1) **Infrastructure** investment key in roads, irrigation, and storage. Important role for WB and regional development banks (Robinson for Tanzania, Magruder for Rwanda,...)
- (2) **Lead agents**: Case studies of **VCD**/modernization suggest that the most successful initiatives tend to be **demand-driven** (led by agroindustry, agro-exporters, supermarkets, Kellogg rice millers, Danone yogurts, Nestlé cocoa processors, who are close to consumers) rather than **supply-driven** (led by PO and productive alliances, One Acre Fund/Digital Green, input suppliers such as Syngenta, IFDC, OCP)
- (3) **Targeting**: Success in VCD/modernization strategies suggests **building on the best** VC (Lin), regions, and farmers to secure competitiveness

(4) **SDG1&2:** Development agencies and governments can use a **typology** of rural populations to define **complementary** interventions toward SDG and to **scale up** strategies of VCD/modernization toward other regions and farmers. Labor market effects can share benefits of VCD under large-farm vertical integration with poor rural inhabitants (Swinnen)

Typology of rural households (based on Schejtman; Eswaran and Kotwal)

	Land	Labor allocation			Ag product disposition	
	endowments	Off-farm	On-farm	Hire & supervise	Net buyer	Net seller
Rural worker	0	++	0	0	++	0
Sub-family farmer	+	+	+	0	+	0
Family farmer	++	0	+	0	0	+
Small commercial farmer	+++	0	+	+	0	++
Large commercial farmer	++++	0	0	++	0	+++

Off-farm labor includes employment in both agriculture and the rural non-farm economy

Sub-family Farmer Production for home consumption (subsistence farming) with complementary purchase
 Need access to additional assets for market participation

Family farmer Production for home consumption and sale; Inclusive VCD Model

Role of social assistance for rural workers and sub-family farmers

- (5) **Role of government:** use global **coordinators/ orchestrators** such as **ATA** (Ethiopia, Rwanda) and state government think-tanks (Odisha) to define, monitor, and help implement AT/RT strategies. Government has a key role to play in terms of trade policy, market intelligence, quality standards, certification, and internalization of externalities (PES). **War room** approach for coordination of real-time responses
- (6) **Pro-active role for government, aid/IFC, philanthropy:** use nudges, smart subsidies, **pick-the-winner** interventions, **PPP**. Promote **entrepreneurship** and business incubators. Experiment with new business models and contracts

(7) **Coordination** in VC is important for shared norms, complementary private investments, and investment in VC club goods. Four channels are observed (case studies):

- **Lead private agent/monopolist** in the VC: agroindustry, agro-exporter, supermarket, aggregator
- **Lead social institution** in the VC: PO, coop
- Government/donor-initiated **multi-stakeholder platform** (CGIAR/CIP native potatoes)
- **Government/donor-supported** multi-stakeholder effort

Experience shows that **most prevalent** channel is coordination by demand-driven lead private agent with local monopsony power (FARM Foundation report)

- (8) **Contracting** is key to secure transactions and overcome market failures and government deficiencies
- Main aspects of effective contracts is avoidance of **side-selling** by contracted and **hold-up** behavior by contractor
 - **Flexible** contacts can accommodate for price volatility, offer quality **certification** for higher value
 - **PO** can be effective for bargaining power and farmer guidance (WB Productive Alliances)

8. Some research results on the cumulative strategy

(1) GR through risk reduction in India

Flood resilient rice lowers downside risk (shock-coping) and induces behavioral response (risk management), with more use of fertilizers and adoption of more labor intensive cultivation technologies. Part of **adaptation to climate change**

(2) GR through agro-dealers with extension capacity

Train agro-dealers so they can become not only merchants of inputs but also sources of technical advice. Advantage is scalability and high power incentives. Inconvenient is narrow limits to the technological/ institutional constructs they propose

(3) AT through short duration rice varieties in Bangladesh

Short duration rice varieties have a lower yield but free the land between rice crops for a third high-value crop, typically potatoes and onions in Orissa. This AT extends the labor calendar, especially during the hungry season.

(4) AT through quality recognition in Senegal onion markets

Quality recognition in onion markets (weight and grade) helps higher quality fetch **higher price**. This in turn induces farmers to **improve the quality** of onions in production (better fertilizers) and marketing (sorting by quality).



Randomized Controlled Trial for quality recognition in the onion value chain in Senegal

(5) AT through resource-providing productive alliance contracts in VC

Contracts for high value crops between a producer organization and a commercial partner can include access to credit, inputs, technical assistance, and eventually insurance. Review of extensive case studies shows that success requires strong **producer organizations** (avoid side-selling behavior), and **donor/state intervention** to initiate contracting and regulate contracts (avoid hold-up behavior).

(6) GR/AT through triggering demand for information in social networks by signaling existence of new technology with informed farmers (Head-to-Head demonstrations) rather than supply-driven lead-farmer extension models (T&V)

9. Questions for research

- (1) **How to pace AT/RT** (including mechanization, land consolidation) so there is no major **displacement** of the labor force into unemployment and urban slums? Dynamic modeling and implementation agency
- (2) **How to achieve cost effectiveness** in meeting **customization** of technological recommendations (precision farming) to heterogenous conditions and lack of economies of scale? Use **IT-based diagnostics and recommendations** for efficiency gains
- (3) **What policy context for success in AT/RT?** Central and local governance **coordination**. Quick successes and transparency
- (4) **How to do causal research** on VCD/AT/RT? **RCT** easy on contracts. Difficult on coordination, orchestration. Causal research on WB Productive Alliances and WB VCD in West Africa still needed (**rollout of programs**) (Machiavello)

10. Conclusion: Toward a comprehensive strategy

- An **Ag-based growth strategy** with **Assets/GR/AT/RT** can offer an appealing option to SSA/SA countries/regions on the road toward **urban-based ST**
- **TFP growth** (R&D, adoption, modernization) is essential for success rather than intra and inter-farm resource reallocation
- TFP growth/modernization can be **supply-driven** (constraint removal) and/or **demand-driven** (inclusive VC development)
- VCD relies importantly on resource-providing **contracts** and **coordination**. Success with these initiatives is more likely when initiated on the **demand side** than the supply/input side of the VC.
- Successful transformations require a **multiplicity of agents/institutions**: national and local orchestrators, nudgers, VC entrepreneurs & coordinators, farmer support, and POs

- An AT/RT approach based on VCD clearly **builds on the best** to achieve competitiveness. It requires a **complementary** strategy to extend benefits toward the poor (extended inclusiveness, employment benefits) and help meet the SDG1&2.
- **Pacing** the transformations to maximize efficiency and avoid political backlash requires coordinated **real-time** attention by policy makers, donors, and civil society organizations
- **Global/external context:** OECD agricultural protectionism and high transaction costs in intra-Africa trade still pose **serious obstacles** to Ag-based growth strategies

Thanks
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