

Rapid Dual Transformation of the “Hidden Middle” of African & Asian Food Systems

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... “**Rapid**”: transformation not gradual but abrupt, sudden

... image of a **TIDAL WAVE**

... “**Hidden**” **Middle**: often NOT KNOWN to policymakers in Africa & Asia

... where **food security debates are super focused on the farm sector**

... rice farming = 10% of Asian food system (all products & segments)

... maize farming = 10% African food system

... farming is **IMPORTANT**, feeding the whole system,

→ but the “midstream” also is pivotal, decisive, for national food security

... “midstream” of all food system = 40%

... processors, wholesalers, logistics services (truckers, cold storage, warehousing)

... image of **HOURGLASS**

1. Rapid Food system transformation driven by meta drivers & CONFLUENCE of 5 trends

Meta drivers

- **income growth**
- **policy liberalization**
- **Public infrastructure investment**
- **Massive private investment (FDI & domestic)**
- **technology change and transfer (in each segment of supply chains) and cross cutting (e.g. internet)**

PULLED by Downstream demand

1) urbanization

2) diet change in urban and rural areas

“FACILITATED ” by Midstream & Downstream

3) Transformation of processing, wholesale, logistics (dual: large & SMEs)

... and retail (supermarket revolution! FF!)

FED by upstream

4) Farming intensification, commercialization, diversification

5) input value chain development

2. Changes in Downstream demand important for study of the “midstream”

2.1. Urbanization

a) Rapid increase in population share!

... Africa: 24% in 1970, 40% in 2011

... Asia: 24% in 1970, 45% in 2011

b) BIGGER in national food consumption than in population

... South Asia and ESE: 30/40/50-60%

... SE Asia and West Africa: 40/50/60-70%

→ Rural-urban food volume flow growing fast over past 3 decades:

... 800% in Africa

... 1000% in Southeast Asia

→ Massive & rapid growth of the “midstream”

c) Longer & longer supply chains, reach deeper & deeper into rural areas

→ Rural differentiation as function of distance from cities and towns

... Delhi IMPACT on Uttar Pradesh:

... near-urban (deep, mature transformation, “new India”)

... middle (rapid early takeoff of transformation, “emerging new-India”)

... far (hinterland, still traditional, “old India”)

d) Urban differentiation

... Rapid rise of the secondary cities/towns: 60% of urban

→ Hubs for the “midstream” and upstream services

→ demand magnet

... maize-feed-chicken/egg complex in Nigeria, women selling to towns (return to this later)

2.2. downstream “pull factors” continued: DIET CHANGE

... drawing on work with David Tschirley MSU

a) NOT just “urban middle class”

... but in urban and rural areas

... and also among poor

b) Rise of Purchased food in total rural food expenditures (purchased + own production)

Indonesia and Bangladesh, about 80%

Nepal and Vietnam, 65-72%

ESA, 45% Nigeria, 70%

→ Implies rise of rural-rural & urban-rural supply chains

→ including surge of midstream SMEs in these chains

... example of Tanzania, and challenge

c) Rise of Processed food (purchase)

... share of processed in total rural food expenditure in ESA = 39% (in Nigeria, 65%)

... in urban ESA, 53%

... in rural Asia, 59%

... in urban Asia, 73%

... again Africa & Asia pictures converging...

➔ Massive rise of SME & large processors & “stockists”

d) rapid diversification beyond grains

... vegetables/fruit, fish, meat, dairy

**... Asia: 65% of food consumption in rural areas,
75% in urban areas**

... Africa: 50% in rural areas & 65% in urban

➔ Huge rise of SME's in perishables!

... rural packing plants & staging areas

... secondary & primary city wholesale markets

... semi-wholesalers between cities & rural

... logistics (including cold storage!)

3. Focus on Value chain transformation: Quiet & Modern Revolutions

3.1. Stages of transformation of food systems

- a) Traditional**
- b) Transitional**
- c) Modern**

3.2. DUAL transformation of Midstream (and downstream)

**a) From traditional stage to transitional stage:
THE QUIET REVOLUTION (grassroots SME
revolution)**

**... GUESSTIMATE: roughly 2/3 of developing
country food system (probably next 2-3
decades)**

... advanced in Asia, well along in Africa

b) From transitional to modern stage: THE MODERN REVOLUTION (large processors, supermarkets)

... GUESSTIMATE: roughly 1/3 of developing country food system

... well along in Asia, emerging in Africa

c) Overlaps of stages per country & over countries

_____ traditional (waning)
_____ transitional (dominant)
_____ modern (emerging)

4. Transitional to Modern: Modern Revolution

4.0. Overall

... also abrupt/sudden/fast

... driven mainly by domestic but also export markets & FDI as well as domestic investments

4.1. organization/structure change

a) Concentration & partial multinationalization

a.1) symbiosis of

...supermarket revolution

... large scale processors, wholesalers, 3PLS

**a.2) economies of scale and scope
outcompeting traditional players**

4.2. Conduct change in modern midstream

- a.) private standards & quality differentiation**
- b) procurement system modernization (fast tracking supply chain transformation)**
- c) dominos, rolling out: first in processed, then semi-processed, and starting in fresh**

5. Quiet Revolution in the “Hidden Middle”

5.0. Overall

... Sudden & fast

... based on domestic markets & domestic investments

5.1. Structural changes

- a) Longer supply chains driven by urbanization**
- b) Diversification & value added in supply chains driven by diet change**
- c) Proliferation of 10's of 1000's of SMEs in processing, wholesale, 3PLS (transport, warehouse, cold storage)**

5.2. Conduct change

a) Traditional systems up-ended, examples

... tied output-credit arrangements with traders, are disappearing

... shift from traditional rural brokers to town-based wholesalers & 3PLS

... shift from unpackaged bulk sale to packaged, branded milled grains

Boom in SME's in food processing: packaging, labeling, branding



b) Widespread technology changes, for example

... shift from pastures to feed

... from capture to enclosure (chickens, fish)

... to machines for farming, transport, milling, packaging, cooling

→ I believe 75% of technology change in developing countries is of this basic transitional type

... other 25% is modern, emerging (e.g., robotic sorters in fruit packing plants in Mexico)

c) Some examples, all domestic market stories

c.1) Bangladesh fish farming (IFPRI/MSU)

... grew 15 fold in 25 years

... feed sector tripled in 5 years

... big shift from traditional variety (carps) to fast-growers (tilapia, catfish)

... SMEs in the supply chain tripled in 10 years

c.2) Teff in Ethiopia (IFPRI)

... Bart Minten Ethiopia: walk/horse to vehicles in teff value chain in 10 years (100 years in US)

... huge jump in urban wholesale, milling, prepared sales of enjera and milled teff

... Farm response with variety change and intensification

c.3) Booming Nigeria maize/feed/chickens-eggs complex (MSU, Saweda Liverpool-Tasie)

... huge growth in chicken farming at SME scale

... intense involvement of women

... marketing to growing towns

... 600% feed sector growth in 10 years

... growth of the long north south supply chain for maize and feed

c.4) “confluence”: Potato cold storages boom in Agra/India

HIDDEN MIDDLE: Bart and I were told 2009 by government and research gurus “very sadly there are NO cold storages in India”



Fig.1. Heaps in an open area under the shade of trees.

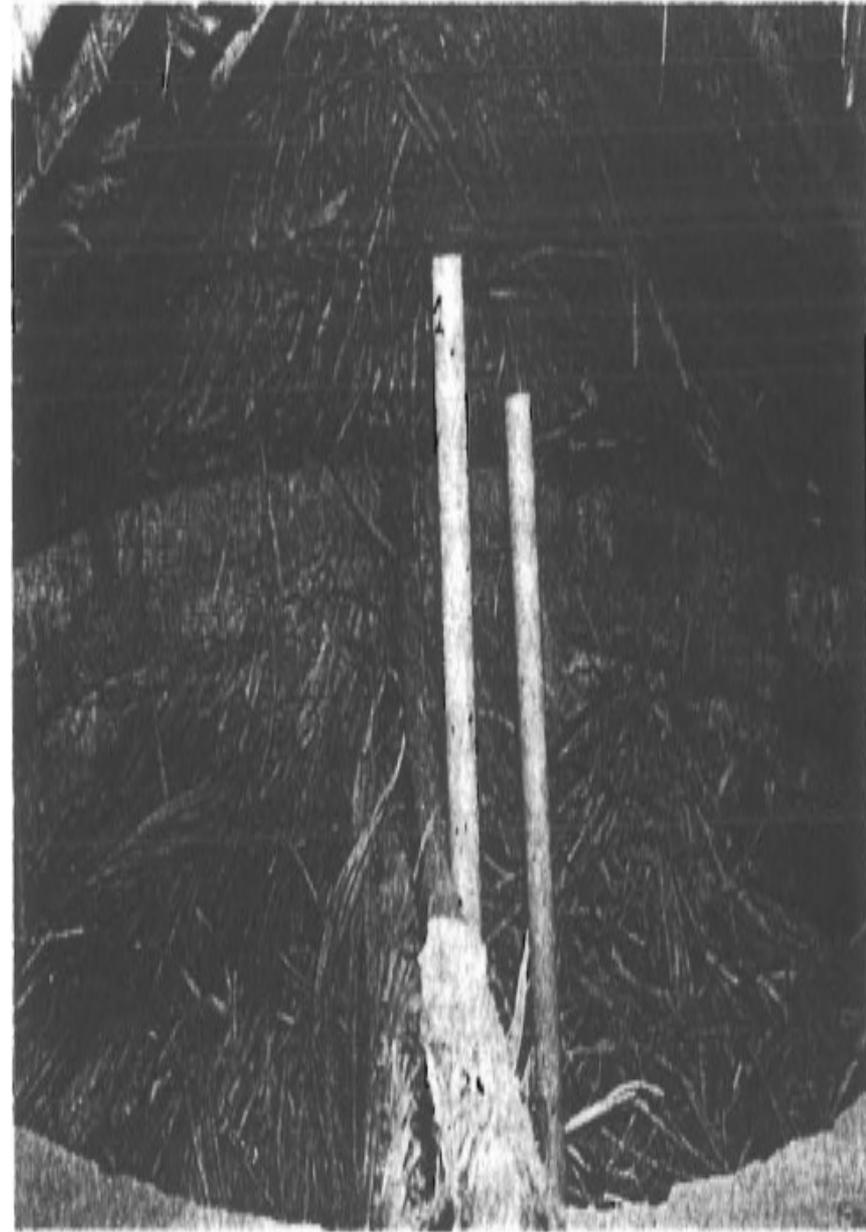


Fig.2. Pit method of potato storage.



Fig.3. Pits covered with hut made up of locally available materials.

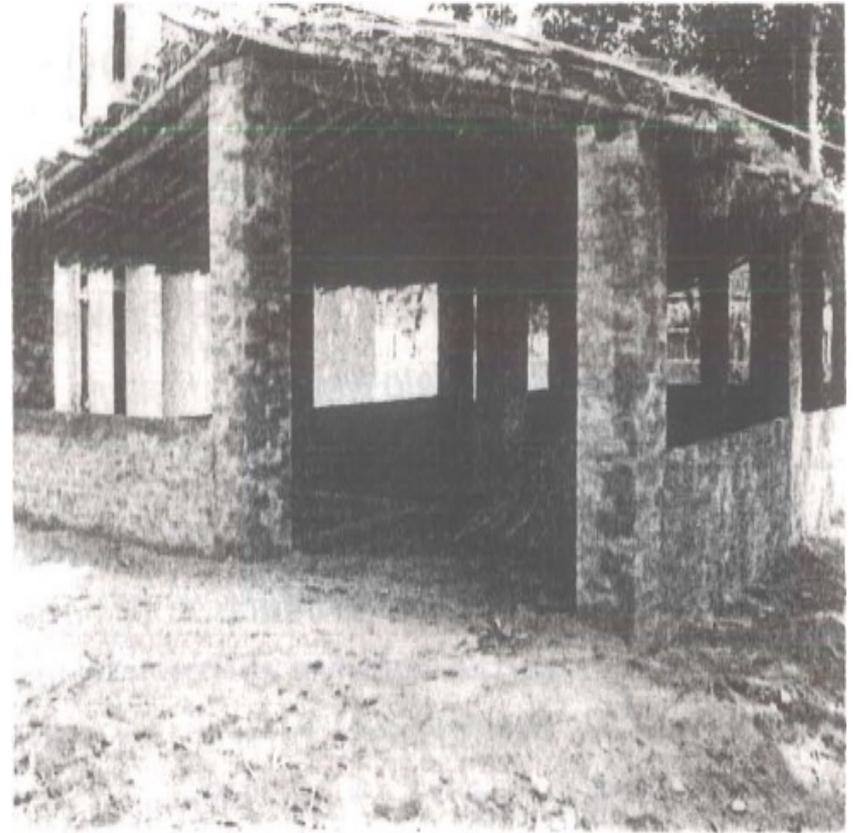


Fig.4. Thatched roof at storage site for providing additional protection against hot sun and rains.

Here, potatoes are heaped under the shade of trees just outside the village. The heaps are covered with a layer of available straw material (about 30 cm thick). Generally, 6-30 tonnes of potatoes are stored in each heap by the farmers. Losses in heaps can reach even up to 40%, if they are not properly made and cut, cracked, bruised, diseased and rotted potatoes were not removed by sorting before storage. The work carried out at Lhe campus showed that it is possible







First wave of public investment & first wave of potato farming development in late 1980s-early 1990s

- Farmers shift from wheat to potato
- Public investment: NARS research & extension of new potato variety (higher yield, longer storage life, more resistant to transport)
- Public investment: water pump subsidies
- Encouraged by initial growth in Delhi economy

Rapid Urbanization as “demand pull”

- **Rapid growth in Delhi’s** population and incomes in the 1990s/2000s (linked to economic liberalization and public investment in city infrastructure)
- **“diffusion” of urbanization effect** in rural space: large public investment in **rural roads**
- **Diet diversification** into horticultural products in urban areas

Rise of the Rural nonfarm sector

- **Rural nonfarm sector development** especially fast and intense in the “market-shed” of Delhi
- **Drives up farm and nonfarm wages**
- **Fuels private investment** in all segments of the supply chain

Second wave of public investments in rural areas

- Public investment in energy grid
- Public investment in limited subsidies for modern cold storages

Modern Cold Storage Boom in 2000s!

- Massive private investment in cold storages starting in mid/late 1990s
- ... crescendo over the 2000s
- b) Shifting potato from seasonal consumption in Delhi to nearly-year round (2/3 from cold store)

Second wave of potato farm development: capital-led intensification in second half 2000s

- capital-led intensification
- Land concentration (rental and purchase)

6. Conclusions

- a) Dual revolution in the “hidden middle” of the food system, driven by CONFLUENCE of trends downstream, midstream, upstream**
- b) Disruptive in its speed: tidal wave, recent abrupt, fast**
- c) Disruptive in its changing of structure, institutions, technologies**
- d) Crucial for research to study the whole food system and understand rapid change**