

Theme 2: Rural and Agrifood Systems in Transforming Economies (Moderator: *Xinshen Diao*)

The purpose of this session is to present what we have learned through FSP-IL research about the drivers, patterns, and implications of rural and agrifood systems transformation (summarized in **FSP Synthesis Report 2**). Implications will be addressed from two perspectives: as changing opportunities and challenges for smallholder farmers, midstream entrepreneurs, and consumers; and for policy responses that are appropriate to the stages of transformation. Key questions addressed in this session include:

- *What are the key drivers of structural, rural, and agrifood system transformation?*
- *What are the most salient patterns of transformation, and how do these vary across and within countries?*
- *Which of these patterns of transformation may be subject to policy influence, and how?*

DETAILED OUTLINE

1:15 – 2:05: Overview and Downstream

A. Presentations (12 minutes/each)

- Setting the stage (Xinshen Diao, 5 minutes)
- Drivers of rural and agri-food systems transformation (Thomas Jayne)
- Diet change and its broad implications (David Tschirley)
- Diet change and employment, with emphasis on youth and gender (David Tschirley)

Floor Discussion (9 minutes)

2:05 – 2:50: Midstream

B. Presentations (12 minutes/each)

- The quiet revolution in the “hidden middle” of African and Asian agrifood systems (Tom Reardon)
- Case study: Soya in Malawi and Zambia (Ferdinand Meyer)
- Food safety issues in food value chains: the role of the hidden middle (Saweda Liverpool-Tasie)

Floor Discussion (9 minutes)

2:50 – 3:10: Coffee break

3:10–4:20: Upstream & Policy Implications

C. Presentations (12 minutes/each)

- The rise of medium-scale farms and rural transformation (Milu Muyanga)
- Mechanization (Hiroyuki Takeshima)
- Agricultural finance (Moraka Makhura)
- Policy implications for agricultural land and rural space (Thom Jayne)
- Policy implications for the midstream and downstream (Tom Reardon)

Floor Discussion (10 minutes)

4:20–5:15: Panel discussion (7 minutes/each)

- Jim Oehmke, USAID
- Chris Delgado, World Bank
- Chuck Moss, University of Florida
- Jennifer Long, USAID

Final Q&A (25 minutes)

Theme 2: Rural and Agrifood Systems in Transforming Economies (Moderator: *Xinshen Diao*)

PRESENTATION ABSTRACTS

Drivers of rural and agri-food systems transformation

-*Thom Jayne*

The past two decades witnessed remarkable progress in understanding the nature and pace of economic transformation in sub-Saharan Africa. Investments in nationally representative household panel survey data in many African countries has made it possible to detect with greater accuracy and disaggregation the changes over time in various indicators of living standards and the drivers of these changes. While some pieces of the puzzle remain unclear, mounting evidence points to profound economic transformation in sub-Saharan Africa since the early 2000s. This session begins by identifying the main sources this dynamism, being mindful of substantial cross-country variation. Key drivers are (i) much improved sectoral and macroeconomic policy management following the contentious period of structural adjustment in the 1990s; (ii) a period of relatively high world food prices since 2006; (iii) massive new investment in African agriculture stemming from both (i) and (ii); (iv) improved governance and stability, and (v) the dynamic interrelationships between farm growth, rising per capita incomes, massive agri-food system investment, dietary change, expansion of on-farm employment, and even greater expansion of off-farm employment.

Key document on this work:

Tschirley, D., T Reardon, Bart Minten, S Liverpool-Tasie. 2017. Agrifood System Transformation in the Midstream and Downstream: Research Findings, Implied Risks, and Implications for Policy and Value Chain Program Design. Food Security Policy Research Brief 36, East Lansing, MI.
Jayne, T.S., Jordan Chamberlin & Rui Benfica (2018). Africa's Unfolding Economic Transformation, *Journal of Development Studies*, 54(5), 777-787.

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Diet change in transforming economies: Key findings and implications

- *David Tschirley*

This paper draws on wide range of work including Tom Reardon, Saveda Liverpool-Tasie, Michael Dolislager, Christine Sauer, and Bart Minten

We characterize the diet transformation and consider its implications for urban infrastructure needs, employment in- and out of the agrifood system (AFS), nutrition, and import dependence. We conclude (1) cities are woefully unprepared for the change in volumes and types of food that will flow through their marketing infrastructure, (2) the contribution of the AFS to employment over the next two decades will depend on jointly strengthening the smallholder farming sector, post-farm SMEs and the “traditional” marketing sector on which both depend, (3) low-income countries are unprepared for the wave of overweight and obesity that will hit them over the next two decades, and (5) diet transformation will not necessarily drive an unsustainable surge in food imports. We suggest policy & research priorities for each area.

Key document on this work:

David Tschirley, Benedito Cunguara, Steven Haggblade, Thomas Reardon, and Mayuko Kondo. 2017. Africa's Unfolding Diet Transformation and Farm Employment: Evidence from Tanzania. [Feed the Future Innovation Lab for Food Security Policy Research Paper 43](#). East Lansing: Michigan State University

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Theme 2: Rural and Agrifood Systems in Transforming Economies (Moderator: *Xinshen Diao*)

The diet transformation and employment

- David Tschirley

This paper draws on wide range of work including Tom Reardon, Saweda Liverpool-Tasie, Jason Snyder, Mayuko Kondo, and Michael Dolislager

We review evidence about the current and future distribution of employment across segments of the AFS and outside the AFS, paying particular attention to youth and gender. We show (1) non-AFS employment shows the greatest growth as spaces become more urban and is likely to capture most employment growth over the next two decades, but post-farm AFS growth has been very strong in several countries over the past decade, (2) post-farm AFS employment is especially important for women and youth, and (3) while attractive farming opportunities will open for small farmers in high-value, rapidly-growing value chains, these opportunities will be small in number. We close by highlighting the inter-connectedness of smallholder farmers, “traditional” marketing systems, and post-farm SMEs, emphasizing the importance of a gradual rather than abrupt transition away from each, and considering the package of policy mechanisms that might contribute to such a gradual transition.

Key document on this work:

David L Tschirley Jason Snyder Michael Dolislager Thomas Reardon Steven Haggblade Joseph Goeb Lulama Traub Francis Ejobi Ferdi Meyer (2015), "Africa 's unfolding diet transformation: Implications for agrifood system employment", Journal of Agribusiness in Developing and Emerging Economies, Vol. 5 Iss 2 pp. 102 – 136 <http://dx.doi.org/10.1108/JADEE-01-2015-0003>

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The Quiet Revolution in the “Hidden Middle” of African and Asian agrifood systems

- Tom Reardon

Authors: Tom Reardon, Saweda Liverpool-Tasie, David Tschirley

The food security debate has focused largely on the farm sector and on trade. Relatively neglected or ‘hidden’ from mainstream debate are the middle segments (processing, logistics, wholesale) of agrifood value chains in developing countries—and yet this ‘midstream’ forms 30–40 per cent of the value added and costs in food value chains. The productivity of the midstream is as important as farm yields for food security in poor countries. Our work in FSP shows that over the past several decades the middle segments have transformed quickly and surprisingly—with a huge volume expansion, a proliferation of small and medium enterprises (SMEs) (in a “Quiet Revolution), but also concentrating and multinationalizing (in some places and products) (an emerging modern revolution), with technology change characterized by capital-led intensification (equipment use by small food enterprises as an example), and with the incipient emergence of branding and labelling and packaging, of new organizational arrangements in procurement and marketing interfaces with farmers and retailers, and of private standards and contracts. Economic policies of market and foreign direct investment (FDI) liberalization, commercial and business climate regulations, hard and soft infrastructure investment, and food safety laws, have begun to pave the path to the expansion and shaped the transformation of the important midstream segment of food value chains.

The FSP work based on “stacked surveys” of the different segments of value chains in Nigeria, Tanzania, Senegal, Myanmar, and Bangladesh emphasizes in particular the amazing Quiet Revolution in the “Hidden Middle” in output supply chains from rural areas to urban areas (that consume more than half

Theme 2: Rural and Agrifood Systems in Transforming Economies (Moderator: *Xinshen Diao*)

the food in Africa and two-thirds in Asia), as well as in input supply chains (such as for farm services and feed). Examples include the poultry/maize/feed complex, the aquaculture/maize/feed complex, maize milling for food, millet second-stage processing/preparation, and outsourced mobile rice harvesting services in those countries. The policy implications focus on the need for policymakers to identify these “take off” sectors and clusters and help them to grow even faster and larger. This includes crucially infrastructure such as wholesale markets, roads, and energy (especially in secondary cities and rural towns), and commercial frameworks and policies that reduce transaction costs and risks for SMEs.

Key documents on this work:

- Reardon et al. 2018. Rapid transformation of food systems in developing regions: Highlighting the role of agricultural research & innovations. *Agricultural Systems*
- Reardon, Thomas. 2015. The hidden middle: the quiet revolution in the midstream of agrifood value chains in developing countries. *Oxford Review of Economic Policy*, 31(1):45-63
- Reardon et al. 2015. Transformation of African Agrifood Systems in the New Era of Rapid Urbanization and the Emergence of a Middle Class. In *ReSAKSS Annual Trends and Outlook Report 2014*, Chapter 4.

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Case study: Soya in Malawi and Zambia

- *Ferdi Meyer*

The oilseed sector in Southern Africa presents a good example of agrifood system transformation and value chains in transition. On the African continent, increased income has driven annual increases in vegetable oil demand of 4.4% since 2000 (OECD-FAO, 2018). Imports have met most of this demand, rising from 50% of total consumption in 2000 to 64% by 2010 at continental level. In recent years however, this share has stabilized 65% and a number of countries have invested to develop local value chains. Two such countries are Zambia and Malawi. Despite this expansion, both countries remain net importers of vegetable oil while exporting a surplus of soya beans. The challenge is that the demand for animal feed from intensive livestock production has not grown at the same pace. In an application of the Regional Network of Agricultural Policy Research Institutes’ (ReNAPRI) partial equilibrium (PE) model, simulations show that sustainable additional development of these chains will depend on (a) improved transportation infrastructure, to advance the efficiency of regional trade in surplus products and (b) simultaneous development of secondary industries (such as intensive livestock operations), to enable uptake of domestic surpluses in country. This case underlines the importance for detailed analysis and understanding of value chains to identify targeted policy interventions and public investments that will drive inclusive agricultural transformation.

Key documents on this work:

- Projecting the impact of transformation in the oilseed sector on policies and investments in Southern Africa, FSP Policy brief, *forthcoming*, March 2019
- Policy prioritization using partial equilibrium modelling and value chain analysis in the Tanzanian sunflower market, *forthcoming*, March 2019

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Theme 2: Rural and Agrifood Systems in Transforming Economies (Moderator: *Xinshen Diao*)

Food safety issues in the maize-poultry value chain: the role of the hidden middle

- *Saweda Liverpool-Tasie*

Authors: Lenis Liverpool-Tasie, Nikita Saha Turna, Oluwatoyin Ademola, Adewale Obadina, Felicia Wu, Thomas Reardon, Ava Sanou and Vincenzina Caputo

Aflatoxin is a toxin produced by mold that grows on crops including peanuts and maize. It is hard to detect and can have devastating effects on human health, including high risk of liver cancer. We studied aflatoxin presence along the maize value chain in Nigeria. We found that aflatoxin contamination in maize based products extends beyond production to storage, during processing and subsequently to final feed and food products. Aflatoxin levels in farmers' and traders' maize significantly increased with length of storage. We find very high aflatoxin levels in feed even when levels in maize used for making the feed was low. This is because of other ingredients such as groundnut cake, which can be contaminated with aflatoxins. Aflatoxin levels were higher in non-branded maize based foods compared to branded products. The major findings of this work is that adequately addressing mycotoxin risk requires consideration of the entire maize value chain and often considerations across interconnected value chains. Actors in the midstream are key in this process but hardly considered. Less than 5% of traders interviewed in largest grain market reported having been trained on how to handle and store maize and less than 10% of survey respondents know about aflatoxins. These results suggest that efforts to address aflatoxin contamination that focus exclusively on one node of the supply chain (e.g. farmers) or even only on the maize supply chain may not necessarily guarantee improved safety of maize based products when combined with other ingredients as in the case of feed and many maize based foods.

Key documents on this work:

Lenis Liverpool-Tasie, Nikita Saha Turna, Oluwatoyin Ademola, Adewale Obadina, Felicia Wu, 2018. The Occurrence and Co-Occurrence of Aflatoxin and Fumonisin Along the Maize Value Chain in Southwest Nigeria. [*Feed the Future Innovation Lab for Food Security Policy Research Paper 113.*](#)

Oluwatoyin Ademola, Saweda Liverpool-Tasie and Adewale Obadina. 2017. Food Safety in the Rapid Transformation of Food Systems in Africa: Aflatoxins along the Maize Value Chain in Nigeria. [*Feed the Future Innovation Lab for Food Security Policy Research Paper 90.*](#)

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Are Medium-Scale Farms Driving Agricultural Transformation in Africa?

- *Milu Muyanga*

Authors: Milu Muyanga, Kwame Yeboah, Ayala Wineman, Antony Chapoto, T. S. Jayne, Divan Vandervesthuisen

Recent evidence suggests changing structure of land ownership in sub-Saharan Africa, a major new trends affecting African agri-food systems. Research in several African countries shows the rapid rise of a medium-scale farming sector. In Ghana, Kenya and Zambia the medium-scale farming sector already control more land than do large scale investors and, in Zambia and possibly also Ghana, now control more land than the other smallholder farmers combined. Within the past decade, the amount of agricultural produce that these farms contribute to countries' national output has also risen rapidly. In Tanzania and Zambia, medium-sized farms now account for roughly 40 percent of the national marketed agricultural produce. The importance of medium-scale farms appears to be greatest in countries with relatively abundant land. While national development policy strategies and investment plans within the region (including CAADP) officially regard the smallholder farming sector as an important vehicle for achieving agricultural growth, and poverty reduction objectives, the meteoric rise of emergent farmers

Theme 2: Rural and Agrifood Systems in Transforming Economies (Moderator: *Xinshen Diao*)

warrants their inclusion. In this presentation we examine the causes and consequences of changing farm structure, and how this is likely to affect the agricultural transformation in Africa.

Key documents on this work:

- Jayne et al. (2016). Africa's changing farm size distribution patterns: the rise of medium-scale farms. *Agricultural Economics, Volume 47*(S1), 197-214.
- Muyunga, M., and T.S. Jayne. 2019. Revisiting the Farm Size-Productivity Relationship Based on a Relatively Wide Range of Farm Sizes: Evidence from Kenya. *American Journal of Agricultural Economics* (forthcoming)

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South-South learning for mechanization in Africa: smallholders, supply side issues, and policy-engagements - *Hiroyuki Takeshima*

Mechanical technologies, including tractors, are one of the critical technological enablers of rural, agri-food system transformation, that complement other agri-food technologies and institutions. In Africa South-of-Sahara, economic transformation, urbanization, among others, have led to growing mechanization by large farmers recently. While this transformation stage often coincides with more smallholders graduating from farming, smallholders have been slow to exit farming in South Asia and SSA, and mechanization adoptions are still found one of the viable options for their income growth. Supporting mechanization of smallholders thus remains important policy issues. The mechanization research under the FSP attempted to investigate three issues; (a) how mechanization (tractors in particular) is used and contributes to smallholders, who may not naturally gain through complementarity between land and mechanical technologies? (b) what are supply-side issues in SSA? (c) how can we influence policymakers? The presentation highlights relevant findings and lessons acquired through the FSP mechanization research. Specifically, findings on (a) derive from several empirical studies, and findings on (b) derive from a book manuscript, while the lessons on (c) derive from policy engagements in African countries including Ghana and Nigeria.

Key documents on this work:

- Diao X, H Takeshima & X Zhang. *A New Paradigm of Agricultural Mechanization Development: How Much Can Africa Learn from Asia?* IFPRI Book Manuscript (forthcoming).
- Takeshima H. (2017). *The roles of agroclimatic similarity and returns to scale in demand for mechanization: Insights from Northern Nigeria*. [FSP Research Paper 127](#) and [IFPRI Discussion Paper 1692](#).

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Responsiveness of Financing policies to Food Systems Transformation: A Case of Malawi - *Moraka Makbura*

Authors: Moraka N Makbura and Olayinka O Adegbite

Financing is one of the drivers of the food systems transformations. This study found that most of the policy documents were connected with the drivers of food system, the food supply chain, consumer behavior and food environment. Policies also addressed financial inclusion, systems development & resource mobilization as one of the driver of food system transformation. Some policy documents

Theme 2: Rural and Agrifood Systems in Transforming Economies (Moderator: *Xinshen Diao*)

showed the interlinkage among financing policies and food security and nutrition (FNS) policies. Most of these identified finance and investment issues as compared to FSN. While most of the current policies with FNS as one of the policy objectives also include finance mechanisms, the reverse is not the case. Most of the financing systems policy documents in Malawi have low sensitivity to food systems transformation. There is a need to increase responsiveness of financing policies to FSN. Multi-stakeholder approaches to financing food systems transformation can ascertain such responsiveness since they are multifaceted and interlinked to food systems. The policy interventions should equally address every component of food systems and financing gaps.

Key documents on this work:

Moraka N Makhura, Olayinka O Adegbite , Elizabeth Mkandawire, Nic Olivier, Flora Nankhuni, Christone Nyondo & Sheryl Hendriks. Are Financing Policies Sensitive to Food Systems Transformation in Malawi? FSP Policy Research Brief (forthcoming)

Moraka N Makhura, Olayinka O Adegbite, Elizabeth Mkandawire, Nic JJ Olivier, Florah Nankuni, Christone J Nyondo & Sheryl Hendriks. Mapping Policy Responses to Food Systems Transformation in Malawi. FSP Policy Research Brief (forthcoming)

