Who Will Feed the World’s Cities?
The Rural-Urban Convergence

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“...Move the food security debate out of the silos- rural development and food security, food supply chains/agri-business and food security, urbanization and rural development. In the modern world, these are bundled and interconnected. The food security debate should be too.”

--Tom Reardon and Peter Timmer 2014 (GFS J)
By 2050, 70% of the world’s population will be living in urban areas in search of employment and economic opportunities. 

Who will feed these growing populations?

Pace and Type of Urbanization

**Figure 4.** Average annual rate of change of the percentage urban by major areas, 1950–2050

**Figure 8.** Global urban population growth is propelled by the growth of cities of all sizes

What is happening in rural areas?

Approximately ~3.4 billion people currently live and work on about 500 million small-scale farms across the developing world.
Impacts of Rural Livelihoods with Increased Urbanization

• In many parts of the world, we are seeing encroachment of cities into peri-urban and rural communities as well as “ruralized” urban areas and “urbanized” rural landscapes

• Loss of agricultural land due to urban expansion

• Declines in rural social services

• Push factors – climate change, natural capital declines

• Pull factors – Diversification of earnings and remittances; off-farm agribusiness/value chain expansion

Satterthwaite et al 2010 Phil. Trans. R. Soc.
Urban expansion will impact cropland

- Urban expansion will result in a 1.8–2.4% loss of global croplands by 2030, with substantial regional disparities.
- About 80% of global cropland loss from urban expansion will take place in Asia and Africa.

Bren d'Amour et al 2017 PNAS
Urban Bias Remains an Obstacle

Causes include:
- increased discrimination in domestic pricing policies and in the international trade regime,
- decreased financial support from LDC governments and aid donors, and
- increased neglect of agriculture in development theory and economic research.

Table 1. The persistence of domestic and international urban biases: causes and manifestations

<table>
<thead>
<tr>
<th>Domestic urban biases (Section III)</th>
<th>International urban biases (Section IV)</th>
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<tbody>
<tr>
<td>Private Sector</td>
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<td>Public Sector</td>
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<td>Causes</td>
<td>Causes</td>
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<tr>
<td>• Colonial inheritance of dualistic economy</td>
<td>• Relatively weak political voice of rural poor relative to rural rich, urban rich, and even urban poor</td>
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<tr>
<td>• Externalities to agriculture not internalized</td>
<td>• Relatively strong political voice of rural OECD constituencies (OECD’s rural bias)</td>
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<td>• Severe market failures in agriculture</td>
<td>• Washington-Consensus skepticism of government intervention in general, and sectoral intervention in particular</td>
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<td>Manifestations and costs</td>
<td>• Perception that rural projects and Green Revolution have largely failed</td>
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<tr>
<td>• Persistent rural poverty, urbanization of rural poverty, premature and thwarted attempts at industrialization</td>
<td>• Large levels of trade protection against LDC agricultural exports</td>
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<td>• High land inequality in Latin America; high rural-urban inequality in Africa and other LDCs</td>
<td>• High and rapidly increasing levels of subsidization of OECD agriculture</td>
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<td>• Sharply declining aid flows to agriculture sector</td>
<td>• Declining World Bank research on agriculture relative to other fields</td>
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Investment in Agriculture

Average annual rates of growth in public expenditure on agricultural R&D, by decade and income group

Notes: Simple average of annual rates of change in spending on agricultural research in each group for each decade. Data exclude countries in Eastern Europe and the former Soviet Union.
“Twelve thousand years have passed since we began to transform from forager: to settled farmer. It took several thousand years of learning and culture before the transition was nearly complete. The twists of nature that human ingenuity devised have ratcheted up, step by step, our dominance as farmers on the planet. **Now we are transforming from farmers to urbanites. Our newest experiment—to feed massive numbers of people from the work of a few—is just beginning. The outcome is yet to be seen.** There will surely be more hatchets and pivots in the never-ending cycle of our species' manipulations of the planet’s endowments. Humanity is still, and will always be, learning to live with the massive transformations our ingenuity has wrought.”

– Ruth DeFries, *The Big Rachet*
Stages of the Nutrition Transition

Globalization, urbanization, economic growth, technological changes for work, leisure, & food processing, mass media growth

Pattern 1
Hunter gatherer societies (rare)
- Wild plants & animals – low in kcal
- Low in processed foods
- Consume mainly water/tea
- Labor intensive

Lean & robust, High infectious diseases
- Low fertility, Low life expectancy

Pattern 2
Famine-prone Regions and societies
- Cereals dominate, high carbohydrates
- Minimal processed foods
- Consume mainly water, tea, alcohol
- Labor-intensive

MCH deficiencies Stunting and wasting
- High fertility, high MCH mortality, low life expectancy

Pattern 3
Receding famine/smallholder, rural
- Starchy, low variety, low fat, high fiber
- Increased processed, packaged foods high in fat, sodium, sugar
- Water, caloric beverages, tea, and alcohol
- Labor-intensive work job/home

MCH deficiencies Stunting and MNDs
- Slow mortality decline Slow stunting decline

Pattern 4
Modernized, rural, and more peri-urban urban societies
- Increased fat, sugar
- Increased processed, packaged foods high in fat, sodium, sugar
- Caloric beverages, alcohol
- Shift in technology of work and leisure

Obesity emerges Diet-related NCDs
- Increased life expectancy but increased disability Increased NCDs

Pattern 5
Educated, mainly urban
- Reduced highly processed foods high in trans fat, sodium, and sugar
- Increased fruit, veg, fiber
- Increase water, reduced caloric beverage intake except alcohol
- Replace sedentarianism with physical activity for exercise

Reduced obesity, Reduced diet-related NCDs
- Extended lifespan
- Reduced mortality due to NCDs

MCH deficiencies Stunting and MNDs
- Slow mortality decline

Source: Popkin 2006; Crino et al 2016; Revised Fanzo et al 2017
How are diets changing?

- Rising incomes, urbanization, greater female participation in the workforce, wider media penetration—all are driving the demand for **higher-value products**, semi-processed and processed products, and convenience foods.

- Diets are globalizing too, with local consumer preferences influenced by international tastes.

- These trends open new markets for a wide range of higher-value agricultural products and propel the evolution of the marketing system in many developing countries, with the entry and rapid growth of supermarket chains and the food processing and food service industries.
Ecuador: The Ayme family of Tingo
Food expenditure for one week: $31.55
Family recipe: Potato soup with cabbage
United States: The Revis family of North Carolina
Food expenditure for one week: $341.98
Favorite foods: spaghetti, potatoes, sesame chicken
Demand Factors

Mediating Factors

Supply Chain/Retail Revolution

Factor Market Development

Changing Agricultural Technology

Changing Dietary Patterns

Urbanization

Supply Factors

Five Interlinked Transformations of the Food System

http://dx.doi.org/10.1016/j.gfs.2014.02.001
High Value Products

• The perishability of most high-value agricultural products requires careful handling, special facilities (packhouses, cold storage, and refrigerated transport), and rapid delivery to consumers to maintain quality and reduce physical and nutritional losses.

• In many developing countries and rural areas, the long supply chain, poor access to roads and electricity, and inadequate infrastructure and services in physical markets add to the transaction costs and cause quality deterioration and high spoilage losses.
Why should we invest in rural development?
1. Hunger and undernutrition dominate rural populations (although also high in many urban slums), thus there is a need to invest in sound food security and nutrition strategies to tackle the burden to ensure that farmer families are healthy.
Rural Populations Remain Food Insecure
Rural Populations Have Higher Burdens of Undernutrition

Number of stunted urban children

- South Asia
- Sub-Saharan Africa
- East and southeast Asia
- Central Asia, Middle East, and north Africa
- Andean and central Latin America and Caribbean
- Southern and tropical Latin America
- Oceania

Number of stunted rural children

Paciorek et al Lancet Global Health 2013
Work and Human Development are Synergistic
2. While urban agriculture holds some promise depending on the context, rural landscapes still produce the majority of food around the world, and should continue to do so.
Urban agriculture

• “Small areas within cities, such as vacant lots, gardens, verges, balconies and containers, that are used for growing crops and raising small livestock or milk cows for own-consumption or sale in neighborhood markets” (FAO, 1999).

• Systematic estimates of UA’s prevalence are notably lacking, though a recent analysis of data from 15 developing or transition countries found country-level participation rates ranged from 11% to 69% (Zezza and Tasciotti, 2010).

• Constraints: insecure land tenure, polluted land and water, limited access to resources and support services, lack of recognition by city authorities.
Are rural farmers feeding the world?

• 80% of the farmland in sub-Saharan Africa and Asia is managed by smallholders (working on up to 10 hectares).

• Smallholders provide up to 80% of the food supply in Asian and sub-Saharan Africa.

• In Australia, Latin America and North America, food coming from rural places are from medium to large holdings.

• Women comprise 45% of the agricultural labour force of developing countries up to almost 50% in Eastern and Southeastern Asia and sub-Saharan Africa.

FAO Family Farms Brief 2015; Samberg et al 2016 Environmental Research Letters
Smallholders Are Producing A lot of Our Food

Samberg et al 2016 Environmental Research Letters
3. Smallholder farmers have more diversified landscapes and produce approximately more than 50% of the world’s nutrients, making important contributions to the overall dietary diversity for the world’s population.
Much of the world’s livestock food comes from small mixed farms in developing countries

Developing-country mixed crop-livestock systems, most of them smallholders, make a contribution to the world’s livestock products

Herrero et al. 2009; Smith ILRI 2015
4. There are many successful examples of how, through better linkages with urban centers, rural development can feed populated centers while jumpstarting entrepreneurship, empowering women, and sustaining rural livelihoods.
The overall goal in using agriculture for development is to promote the inclusion of smallholders in the new food markets and to provide good jobs in agriculture and the rural nonfarm economy.

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<th>Issue</th>
<th>Public investments</th>
<th>Policy environment</th>
<th>Private sector</th>
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<tr>
<td>Lack of access to markets</td>
<td>Invest in education, rural infrastructure (roads, markets, electricity, irrigation); support formation of producer organizations</td>
<td>Liberalize domestic trade; foster development of input and credit markets</td>
<td>Assist farmers in forming producer organizations</td>
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<td>Weak technical capacity</td>
<td>Support market-oriented extension</td>
<td>Foster environment for private extension to emerge</td>
<td>Provide extension and key inputs to farmers</td>
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<td>Meeting quality standards</td>
<td>Support farmer training on good agricultural practices for quality enhancement and food safety</td>
<td>Establish grades and standards</td>
<td>Supply inputs and train farmers on quality management and food safety</td>
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<tr>
<td>Meeting contract conditions</td>
<td>Train firms in contract design and management; train farmers on their rights and obligations</td>
<td>Foster institutions for dispute resolution; strengthen producer organizations</td>
<td>Foster trust; develop contracts that are self-enforcing</td>
</tr>
<tr>
<td>Farmer exposure to risk</td>
<td>Foster development of commodity and futures exchanges; train firms on use of market instruments to hedge risk</td>
<td>Create enabling environment for insurance market</td>
<td>Use contracts that share risk equally among parties; assist farmers to access insurance</td>
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Source: Adapted from World Bank 2007e.

World Bank Development Report 2008
Enhancing Opportunities

• Organize small producers and SMEs for marketing by providing agricultural credit and micro-finance

• Invest in Ag R&D → client oriented, problem solving, partnership focused, market responsive

• Provide opportunities for farmers to diversity into higher value products

• Promote activities that add value (processing, branding, marketing) and retain surplus in rural areas → thinking ‘beyond the farm gate’

• Promote entrepreneurship opportunities for women

• Address healthy and social issues of rural places: gender, youth, social exclusion...
Reducing Risk and Vulnerability

- Investing in integrated management practices to reduce risk, esp. in complex, diverse, less-favoured regions
- **Strengthening tenure security and access to land** → recognise local land rights + improve land markets
- **Non-farm opportunities and migration** → to escape ‘dynamic poverty traps’ (‘hanging in’)
- **Targeting the vulnerable** → social protection – insurance, resilience-building investments
Areas of employment along the value chain

Net increase of nutrition along the value chain
Maximize nutrition “entering” the food value chain

- Improved varieties, bio-fortification strategies
- Focus on women farmers, diversification, extension, insects
- AFLatoxin control, refrigeration
- Fermentation, drying, fortification, product reformulation (reduce salt, sugar, unhealthy fats)
- School feeding programs, voucher schemes, targeting of vulnerable groups
- Messaging on the importance of nutrition, benefits of certain foods
- Home fortification with MNP (fish powders), training in nutritious food preparation, time management, food preservation

Input Supply
- Lack of knowledge of improved varieties, nutritious crops
- Lack of access to inputs (seeds, fertilizer, extension)

Production
- Lack of knowledge of improved varieties, nutritious crops
- Nutrient losses during miling, combination with unhealthy ingredients

Post Harvest Storage
- Contamination, spoilage

Processing
- "Food deserts", export/import impacts on prices and availability

Distribution
- Advertising campaigns for unhealthy foods

Marketing and Retail
- Lack of knowledge of nutrition, nutrient losses during food preparation, addition of salt, sugar, unhealthy fat

Consumption Food Utilization

Maximize nutrition “exiting” the value chain

Fanzo and Downs 2016
Engaging Women in Agriculture

- **Increases in social capital**
  - Means of gaining information about new technologies and farming practices
  - Social networks that may be accessed to smooth consumption in times of hardship or acquire agricultural inputs

- **Increases in access to credit**
  - Greater ability to invest in infrastructure and to smooth consumption or production shocks

- **Increases in human capital and access to productive resources**
The Power of Peri-Urban Farmers

• Started off with 300 resource-poor vegetable woman farmers on the outskirts of Nairobi in peri-urban areas.
• With support and training, farmers began growing leafy vegetables.
• The largest supermarket chain in Kenya, agreed to sell the vegetables. The vegetables quickly became fashionable and shed their lower-class status; they are now the most consumed vegetables in the country.
• Produce delivery to market outlets increased from 31 tons to 400 tons/month.
• There was a two to 20-fold increase in incomes of the farmers.
Summary

• Invest in ending hunger and undernutrition in rural areas – pathway of human development and dignity
• Realize that rural farmers are significant contributors to feeding the world
• Rural producers contribute a vast majority of the nutrient diversity in our global food basket
• Invest in smallholders: markets, roads, value chains, high value product development, women
• Diversify into high-value food crops that provide more scope for many local farms (and smaller farmers) and may have valuable multiplier links within the local economy