Leveraging food systems to improve nutrition in low- and middle-income countries

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the global nutrition landscape
2 years 9 months

2 years 6 months
GLOBAL PREVALENCE OF <5 CHILD STUNTING

Source: de Onis et al (2011), PHN
GLOBAL TRENDS IN STUNTING AMONG CHILDREN

Source: Black et al. (2013), Maternal and child undernutrition and overweight in low-income and middle-income countries, *The Lancet*
Over the past 35 years, the prevalence of obesity among adults in the U.S. has more than doubled.

The average American is more than 24 pounds heavier today than in 1960.

The prevalence of childhood obesity has more than tripled since 1980.

Source: http://stateofobesity.org/rates/
OVERWEIGHT AND OBESE ADULTS (%), BY REGION

Source: Overseas Development Institute; as reported at: http://www.bbc.co.uk/news/health-25576400
THE NUTRITION TRANSITION

• Diets in low- and middle-income countries converging toward “Western diets”

• Shifts in diet and activity patterns are occurring rapidly

• Country capacity to address rapid increases in NCDs is limited

• The co-occurrence of undernutrition and overweight

Source: Popkin et al. (2012), The Global Nutrition Transition: The Pandemic of Obesity in Developing Countries, *Nutr Rev*
business as usual
PREVALENCE OF STUNTING IN CHILDREN AGED 0-5 Y AND GDP PER PERSON

Source: Ruel et al. (2013), Nutrition-sensitive interventions and programmes: how can they help to accelerate progress in improving maternal and child nutrition?, Lancet
the potential for food systems to make a difference
DISTRIBUTION OF FARMS AND FARMLAND AREA WORLDWIDE, BY LAND SIZE CLASS

Source: FAO (2014), The State of Food and Agriculture: Innovation in Family Farming
• Crop diversity was associated with more positive infant and young child feeding practices

• This relationship was stronger among households at high elevations

Source: Jones (2014), The production diversity of subsistence farms in the Bolivian Andes is associated with the quality of child feeding practices as measured by a validated summary feeding index, Public Health Nutrition
• Households with more diverse agricultural production in Malawi had more diverse diets

• Market-orientation of production, wealth, and gender played important roles in this relationship

Source: Jones et al. (2014) Farm production diversity is associated with greater household dietary diversity in Malawi: Findings from nationally representative data, Food Policy
Source: McClafferty et al. (2014), Cultivating Nutritious Food Systems, GAIN
IMPORTANCE OF VALUE CHAINS FOR NUTRITION

• Cost of farm commodities as ingredients in the U.S. is only a small share of the cost of retail food products (~20%); even less for sodas and prepared meals

• Healthfulness of “ingredients” produced by agriculture may matter less for nutrition as compared to how they are substituted, transformed, and marketed relative to each other throughout the supply chain

Source: Alston et al. (2008), Farm subsidies and obesity in the United States: National evidence and international comparisons, Food Policy; Hawkes et al. (2012), Linking agricultural policies with obesity and non-communicable diseases: A new perspective for a globalising world, Food Policy
ANNUAL GLOBAL FOOD WASTE

- 20% of oilseeds
- 20% of meal and dairy
- 40–50% of root crops, fruits, and vegetables
- 35% of fish
- 30% of cereals

1/3 of the world’s food is wasted each year, equivalent to 1.3 billion tons.

Source: Jones A (2015), Healthy Food for a Healthy World, Chicago Council on Global Affairs
### FIVE DOMAINS OF EMPOWERMENT IN THE WOMEN’S EMPOWERMENT IN AGRICULTURE INDEX

<table>
<thead>
<tr>
<th>Domain</th>
<th>Indicators</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>Production</td>
<td>Input in productive decisions</td>
<td>I/10</td>
</tr>
<tr>
<td></td>
<td>Autonomy in production</td>
<td>I/10</td>
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<tr>
<td>Resources</td>
<td>Ownership of assets</td>
<td>I/15</td>
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<tr>
<td></td>
<td>Purchase, sale, or transfer of assets</td>
<td>I/15</td>
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<td></td>
<td>Access to and decisions on credit</td>
<td>I/15</td>
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<tr>
<td>Income</td>
<td>Control over use of income</td>
<td>I/5</td>
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<tr>
<td>Leadership</td>
<td>Group member</td>
<td>I/10</td>
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<td></td>
<td>Speaking in public</td>
<td>I/10</td>
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<tr>
<td>Time</td>
<td>Workload</td>
<td>I/10</td>
</tr>
<tr>
<td></td>
<td>Leisure</td>
<td>I/10</td>
</tr>
</tbody>
</table>

Source: USAID (2014), Women’s Empowerment in Agriculture Index
A ‘ZERO-SUM’ GAME

Source: McGuire and Popkin, 1989
A ‘ZERO-SUM’ GAME

- Agricultural production
- Maternal health and care
- Child care
- Income-earning activities

Source: McGuire and Popkin, 1989
ENVIRONMENTAL ENTERIC DYSFUNCTION

- Intestinal inflammation
- Shortened ("flat") intestinal villi
- Crypt hyperplasia
- Microbial translocation ("leaky gut")
- Systemic inflammation
Chronic immune activation

- pro-inflammatory cytokines
  - ↑ Hepcidin
  - ↓ Growth Factor (IGF-1)
    - Anemia
    - Stunting

Immunosenescence

- Impaired response to vaccines and infections

Source: Adapted from Humphrey (2009), Child undernutrition, tropical enteropathy, toilets, and handwashing, Lancet
LEVERAGE POINTS FOR IMPROVING NUTRITION THROUGH FOOD SYSTEMS

1. Productivity and diversity of small-scale farms

2. Access to markets & food value chains

3. Social status and productive capacity of women

4. Livestock, infectious illness & environmental hygiene
THANK YOU

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