Global Food Security: defining the challenge

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Food security definition

“Food security exists when all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”

Food and Agricultural Organization of the United Nations
Components of food security

1. Availability (quantity and quality)
2. Access (quantity and quality)
3. Utilization
4. Stability
Components of food security …

1. Availability (quantity and quality)
Components of food security ...

2. Access (quantity and quality)
Trade critical for food access

Rice Market Sheds in West Africa, Normal Year

Sorghum and Millet Market Sheds in West Africa, Normal Year

Circles indicate major markets. Triangles indicate surplus zones.

Checkpoints and associated delays and costs along main trucking routes

Source: 12ème Rapport de l'OPA/UEMOA, 10 août 2010, West Africa Trade Hub
Components of food security ...

3. Utilization
Conceptual Model for Ag-Nutrition Linkages

Approaches
- Trickle-down
- Magic food
- Diet diversity
- Gender lens

Nutrition Ed
Demand creation

Consumption
- Energy (quant)
- Nutrients (qual)

Productivity
- Short-run
- Long-run

Nutrition

Sanitation

Health

Off-farm

Non-food

Income

Markets

Markets

Food processing & advertising

Markets

Production

Own consumption

Conceptual Model for Ag-Nutrition Linkages

- Off-farm
- Production
- Food processing & advertising
- Own consumption
- Income
- Consumption
  - Energy (quant)
  - Nutrients (qual)
- Nutrition Ed Demand creation
- Nutrition
- Productivity
  - Short-run
  - Long-run
- Health
- Sanitation

Approaches
- Trickle-down
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Components of food security...

4. Stability

Annual Precipitation by Year
Lusaka, 1950-2002

World Bank World Price Indices for Grains and Energy (Pink Sheet) 2000-2011
World Bank Price Indices, 1/1960 – 7/2012 (Pink Sheet)

- Energy
- Grains
Maize prices in nominal USD, 1/1960 – 7/2012 (Pink Sheet)

Maize

CV=0.10

CV=0.20

CV=0.26
Rice prices in nominal USD, 1/1960 – 7/2012 (Pink Sheet)

Note: Thai 5% broken
Next Generation Challenges

1. Population growth and urbanization
2. Pressure on land, water and natural resources
3. Climate change
4. Food system governance
Next Generation Challenges

1. Population growth and urbanization
Demographics Drive Food Demand

The graph shows the trend in food demand from 1950 to 2050, categorized by rural, urban, and total. The demand is projected to increase significantly, with the urban demand showing the most rapid increase compared to rural and total demand.
Demographics for West Africa

Increases from 2010 to 2050

Total population: double
Urban population: triple
Market food: 5-6 times
Urbanization changes type of food demand

![Flowchart showing the relationship between consumption, distribution packaging, farming, and projected growth from 2010 to 2050. The growth is projected to be 6 times in distribution packaging and 3 times in farming.](image-url)
Changes in food system employment and training needs
Urban nutrition hazards
Next Generation Challenges

2. Pressure on land, water and natural resources
Population density in Kenya

People per km²
- <=10
- > 10 and <=25
- > 25 and <=100
- > 100 and <=250
- >250

Design: Steve Longabaugh
Source: LandScanTM, Oak Ridge National Laboratory
Distribution of farm sizes in smallholder farm sectors.

The graph shows the distribution of farm sizes in hectares across quintiles in Kenya, Malawi, Mozambique, and Zambia. The quintiles are ordered from the lowest to the highest farm sizes, with the 1st quintile having the smallest farms and the 5th quintile having the largest farms.

- **Kenya** shows a gradual increase in hectares from the 1st to the 5th quintile.
- **Malawi** also shows an increase but with fewer farms in the higher quintiles compared to Kenya.
- **Mozambique** has a similar trend to Kenya, with an increase in hectares across quintiles.
- **Zambia** has the highest hectares in the 5th quintile, indicating the largest farms among the four countries.

The graph provides a clear visual representation of how farm sizes are distributed among smallholder farmers in these countries.
The arithmetic of poverty

• Net return per person day in farming =

  o Area cropped X
  o Number of crops per year X
  o Yield per hectare X
  o Price per unit of production –
  o Input costs per unit of product /
  o Number of days

+ 

• Non-farm income per person day
Next Generation Challenges

3. Climate change
Changes agro-ecosystem capacity and predictability

Next Generation Challenges

4. Food system governance
Food system governance

Monitoring Policy Implementation

Agenda Setting (Whose priorities count?)

Data Generation
- Gov’t statistical units
- Universities, think tanks
  - Private sector
  - Civil society

Policy Analysis
- Gov’t statistical units
- Universities, think tanks
  - Private sector
  - Civil society

Supply of Policy Analysis

Gov’t Decision Makers

Private Sector

Civil Society

Demand for Policy Analysis

Policy Change

Public Investment

Civil Society Initiatives

Actions

Growth, Poverty, and Hunger Trajectories

Outcomes
Implications for universities

1. Increased demand for projections of trends for food security (Megatrends to micro plots)

2. Improved efficiency in food production, processing, distribution

3. Increased demand for food safety and health outcomes

4. ICTs and knowledge access (producers, consumers)

5. Global economies of scope in knowledge generation