Meeting Global and Regional Food Security Challenges

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Food security is a fundamental human right

Kofi Annan
U.N. Secretary-General, Chairman of AGRA
Why else does food security matter?

Poverty  Hunger

TARGET
Halve, between 1990 and 2015, the proportion of people whose income is less than $1 a day

TARGET
Halve, between 1990 and 2015, the proportion of people who suffer from hunger
Yet the food price run-up that started in 2003 and peaked in 2008 drove at least another 100 million people back below the line of extreme poverty (now $1.08)

Malnutrition reduces human capital accumulation and quality of life

- 42% of children <5 years in low income countries are stunted, i.e. >250 million kids

- 10% of children <5 years in low income countries present severe or moderate wasting

- Micronutrient deficiencies (especially vitamins A & D and zinc) remain high as well

- Hunger, pain, illness, reduced stature, impaired mental capacity

Source: The Global Education Project
It matters greatly when a human being gets (or does not get) proper nutrition.

2008 was awarded for the McGovern-Dole international school feeding program, which stimulated a global commitment to school feeding and enhanced school attendance and nutrition for millions of the world’s poorest children, especially girls…

…yet it is actually the first 18 months that are most critical to human development.
Undernourishment reduces economic growth

Inadequate nutrition, based on either...

- Prevalence of Food Inadequacy (PFI)
- Dietary Energy Supply (DES)...

is responsible for a shortfall of between 0.23 and 4.7 percentage points

in the annual growth rate of per capita GDP

The impact of better nutrition on economic growth operates...

Directly...

Through nutrition's effect on labor productivity

Indirectly...

Via improvements in life expectancy

Source: Arcand, Undernourishment and Economic Growth, 2001
Humans are ultimately plant-eaters, even when we consume meat, dairy products, or eggs.

Of 250,000 plant species, 12 provide 80% of calories.

Just three—wheat, rice and corn—provide 50% of human energy requirements.
Cereal demand will continue to rise globally, and especially in Asia.
There is growing awareness of a major challenge facing the global food system

- We must double cereal production by 2050 to feed 9.3B people (versus 6 B today)
Where will this increased production come from?

- According to FAO, about 10% will come from area expansion from current level of 3.75 billion hectares
- Maybe 20% will come from intensification
- Remaining 70% must come from innovation

10-20-70 rule
Global yields and production of coarse grains did rise steadily since over four decades.

Global cereal output rose from 3.5 billion MT in 1968 to 7 billion MT, i.e. it doubled.

Source: FAO
...and other key indicators seemed favorable
But per capita agricultural production for the world has been level since 2004...
And all of the increased production enabled by the Green Revolution has already been realized.
Resource constraints such as soil degradation place limits on the rollout of existing or new technologies that raise productivity.
Global water use is rising quickly...

[Graph showing estimated annual world water use from 1900 to 2000, with a rising trend.]
..and some entire countries or major producing regions face increasing water scarcity...
Agricultural uses account for almost 70% of global water withdrawals

Irrigation is the largest use within agriculture

The top 5 geographic units account for 60% of the total irrigated land are 2.77 million km²

- India: 558,080
- China: 545,960
- USA: 223,850
- Pakistan: 182,300
- EU: 168,050
Meanwhile the reliability of supply of irrigation water is declining...

Note: Irrigation Water Supply Reliability is defined as the ratio of actual irrigation water consumption to potential irrigation water consumption.

Source: IFPRI IMPACT projections, September 2007
Irrigated rice makes up 75% of global rice production

..which could affect water-intensive crops such as rice
Climate change is projected to adversely affect ag productivity to varying degrees by 2080.

*Note: Scenario: SRES A2. Source: Cline 2007.*
Yet there are many more mouths to feed, especially in the developing world,
And growth rates in yields for major cereals in developing countries are slowing.
Only maize has kept pace with population

**Maize**

- 1980s: 2.2% per year
- 1990s: 2.5% per year
- 2000s: 3.5% per year

Energy Independence?

Maize is a heavy user of nitrogen fertilizer. This comes from natural gas (Haber process, $\text{N}_2 \rightarrow \text{NH}_4\text{NO}_3$).

Russia: 47,570 billion ft$^3$   Iran: 26,370 billion ft$^3$   U.S.A.: 5,600
While yield growth for rice and wheat has been slowing down the last three decades

**Rice**
- 1980s: 3.1% per year
- 1990s: 1.4% per year
- 2000s: 0.8% per year

**Wheat**
- 1980s: 2.9% per year
- 1990s: 0.9% per year
- 2000s: 0.4% per year
Nominal prices for major food products began to rise in 2003, peaking in 2008...
..which led to food price protests and riots from January 2007 to May 2008

Source: USAID, Office of Food for Peace
The food import bill for developing countries rose steadily for 5 years, LIFDCs faster still

Source: adapted from FAO, 2008b.
Poverty impacts of the food crisis varied significantly, but were generally severe.

Poverty impacts depend on: share of net buyers and net sellers; the share of food in the consumption basket; the level of the poverty line; pass-through; extent of own consumption; secondary wage impacts, etc.

Bank’s initial estimate of global increase in $1/day poverty headcount was 4.5 percentage points (or 105 million additional poor).

More recently FAO estimated that global poor had risen to well over 1 billion persons.
Distributional impacts of higher food prices also varied significantly, in some cases severe

- In Vietnam, poverty headcount fell, although the severity of poverty increased. Also, significant regional variation (SE and Central Highlands, Mekong Delta)

- Rising inequality from food prices:
  - Recent food price increases raised the Gini index of inequality by five percent in Bangladesh.
  - Rich-poor gaps widening in Latin America especially.
Nutritional impacts affected the most vulnerable

- Basic staples represent a large portion of the daily caloric intake of the poor (Vietnam)

- Children under 2 and pregnant women most vulnerable – groups most likely to see reductions in consumption levels

- Impacts extended to stable high growth countries, e.g. India has double the rates of stunted children (47%) than SSA (24%) and 1.5 to 1.8 million more children in India are currently at risk of malnourishment from higher food prices.
Surge in food prices can be attributed to a mix of factors, impossible to disaggregate

- High oil prices have played central role
  - Increased costs of production contributed to slower yield growth
  - Sparked decision to increase bio-fuel mandates

- Decline in food stocks
  - Reflects decade long trend to reduce government stocks
  - Several bad crop years
  - Biofuel-related demand shock

- Increases aggravated by policy and speculative reactions
  - Export bans
  - Decisions to withhold supply in hope of higher prices
  - Financial speculation (of uncertain magnitude)

Source: Dudush and Cord, World Bank, 2009
Roots of the on-going challenge are diverse, exacerbated by broader context

Source: Dudush and Cord, World Bank, 2009
Developing countries responded to higher prices with different policies and programs, some distortionary

How did the donor community respond to the food price crisis of 2008?

- UN Secretary General’s High-Level Task Force for the Global Food Crisis established Berne, April 2008
- UN Comprehensive Framework for Action was launched at the UNGA in September of 2008
- Priority given by all partners to fundraising by/for WFP for humanitarian assistance

Agreement reached on:
- Need for rapid financing to countries to support policy changes
- Social protection
- Risk mitigation using financial tools, physical hedging
- Maintain productive capacity in short run
- Transition to longer term food production viability
How did the World Bank Group respond?

- Global Food Crisis Response Program (GFRP) was approved May 29, 2008 as **umbrella** for providing rapid Bank support for a comprehensive response to the crisis.

- **Provides balance** between short run food stabilization and measures to ensure countries able to cope better in medium term, including longer term action and lending to enhance **agricultural productivity**

- GFRP seeks to:
  - **Minimize threat of rapid unforeseen increases** in food and agricultural input prices to poor people.
  - **Help clients avoid short term responses that are counterproductive** in the longer term by offering advisory assistance.
Key elements of the GFRP

- **Fast-tracking of up to $1.2 billion of Bank resources:** existing country envelopes, re-programmed funds, regional IDA funds where appropriate, a new $200 million trust fund from IBRD surplus (Food Price Crisis Response Trust Fund)

- **Greatly expedited procedures for rapid response** by streamlining Bank approval procedures
Key elements of the GFRP (cont.)

- Component 1: **Food price policy and market stabilization**
  - Examples: Support for grain stock management, improved use of market-based instruments to manage food prices, tax and trade policies

- Component 2: **Social protection actions to ensure food access and minimize the nutritional impact of the crisis on the poor and vulnerable**
  - Examples: Cash transfer program (CCTs, food stamps), school feeding, targeted food supplements and micronutrients
Component 3: Enhancing domestic food production & marketing response
- Seed and fertilizer supply and market development
- Rehabilitation of small-scale irrigation
- Action research and CDD support for post-harvest loss reduction
- Strengthening access to finance and risk management tools

Component 4: Implementation support, communications and monitoring and evaluation
Progress to date under the GFRP

- $916 million in 40+ Board-approved projects in 31 countries since May 29, 2008
- $734 million of this has been disbursed (80%)
- $258 firm Bank funds pipeline in 9 countries
- **Overall, $1.174 billion in Bank funds** approved and planned in 36 countries worldwide
- **Additional pipeline of $187 million in external trust funds** (Australia, Russia, EC) directed to 17 countries
- **GFRP is presently a $1.4 billion effort** targeted to 44 separate countries
Many thoughtful people are worried about food security
Many of the threats to food security are nothing new

- Weather & related events
- Agricultural pests/disease
- Climate change
- Poverty
- Human health issues
- Poor levels of education
- Rapid population growth
- Environmental degradation
- Public policy decisions
- Private investment decisions
- Conflict
yet some observers think that we may be seeing the start of structural change

Source: World Bank, 2009
Unless high grain prices engender productivity growth in developing country agriculture, they tend to raise costs more than overall household income.

Volatile grain prices tend to discourage investment in increasing food productivity that would help solve long-term problem.

They also tend to discourage labor-intensive industrialization and agribusiness.

Volatile food prices also tend to encourage over-investment by poor people in developing countries in backyard subsistence food production for risk mitigation, which actually cuts incomes even further.
with price transmission mechanisms between global and domestic prices weakened...

Recent Wholesale Rice Prices in Thailand

Source: FAO, Crop Prospects and Food Situation, April 2009
...and real world cereal prices projected to rise 30-40 percent in the coming decades

Price (US$/mt)

Source: IFPRI IMPACT projections, September 2007
What about Asia, more specifically?
Although Asian cereal production continued to increase from 2007-2009…

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Source: FAO, Crop Prospects and Food Situation, April 2009
...the annual average percentage increase in rice yields between successive rolling 5-year periods in rice-producing Asia has been falling.
...7 countries in Asia still had to import more than 1 million MT per year of cereals...

Source: FAO, Crop Prospects and Food Situation, April 2009
The Asian region has long faced serious challenges in terms of undernourishment.

Stunting in EAP was evident in about 35% of under-5 children, post-2000...

...and in South Asia it was around 37%

Wasting in EAP was evident in about 9% of under-5 children, post-2000

...while in South Asia it was more than 12%

Source: WHO Global Database on Child Growth and Malnutrition
And it rose dramatically with the food price crisis

Source: FAO, State of Food Insecurity, 2008
What then to do now and in the future?
Understand what food security really means

“...When all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life”

Source: FAO, 2004
Decide which aspects of the food security challenge merit most attention/investment

- **Availability** => overall ability of the agricultural system to meet food demand
- **Access** => by individuals to adequate resources (entitlements) to acquire appropriate foods for a nutritious diet
- **Utilization** => safety, quality and nutritional aspects of food products
- **Stability** => individuals at high risk of temporarily or permanently losing their access to the resources needed to consume adequate food

Source: FAO, 2004
If food availability is your priority, make some decisions regarding means

- Grow your own offshore
- Expand area
- Raise farm productivity
- Increase imports
- Restrict exports
- Reduce post-harvest losses
If access to food seems more important, consider other thrusts

- Reinforce free trade
- Targeted feeding programs
- Give in-kind food aid
- Improve logistics
- Provide cash transfers, coupons, etc
- Manipulate prices
If better food utilization is what you seek, there are still other options

- Develop new products
- Fortify existing products
- Improve diets
- Train foodservice operators
- Improve food safety
- Educate consumers
...or if enhanced food stability is your priority, consider these thrusts

- Use crop or weather insurance
- Create virtual stockpiles
- Develop more tolerant varieties
- Establish warehouse receipts program
- Enhance transit and shelf life
- Create physical reserves
Just remember--
There are no silver bullets!