Food Security and Price Volatility

Eugenio Díaz Bonilla
Executive Director
Argentina and Haití, IDB
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“To identify trade policies that affect price swings on international markets... how trade policies could be reformed ...to ensure that price volatility does not undermine agricultural productivity and food security, especially in developing countries.”

- A Variety of Food (In)Security Situations
- Price volatility and price shocks
- Trade and Trade Policy
- Other Economic and Policy Issues
**WB WDR Agriculture (2008). 2 variables (contribution of agriculture to growth and rural/urban poverty). 3 groups “agriculture-based countries” (SSA), “transforming countries” (SA and EAP), and “urbanized countries” (LAC and EE).**

<table>
<thead>
<tr>
<th></th>
<th>Latin America &amp; Caribbean</th>
<th>Sub-Saharan Africa</th>
<th>Middle East &amp; North Africa</th>
<th>South Asia</th>
<th>East Asia &amp; Pacific</th>
<th>All Developing Countries</th>
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<tbody>
<tr>
<td>Agriculture, value added (% of GDP)</td>
<td>7.9</td>
<td>17.9</td>
<td>13.9</td>
<td>28.3</td>
<td>15.4</td>
<td>13.2</td>
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<td>Rural population (% of total population)</td>
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<td>68.4</td>
<td>43.6</td>
<td>73.2</td>
<td>67.7</td>
<td>60.6</td>
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<td>Agriculture value added per worker (constant 1995 US$)</td>
<td>2915.5</td>
<td>349.2</td>
<td>2163.6</td>
<td>376.2</td>
<td>418.4</td>
<td>589.8</td>
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<td>Agricultural exports (% merchandise trade)</td>
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<td>4.7</td>
<td>17.9</td>
<td>11.7</td>
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<td>Land use, arable land (hectares per person)</td>
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<td>0.26</td>
<td>0.21</td>
<td>0.16</td>
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<td>0.21</td>
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<td>Agricultural machinery, tractors per 100 hectares of arable land</td>
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<td>Roads, km per squared km of total area</td>
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<td>0.052</td>
<td>0.062</td>
<td>0.551</td>
<td>0.139</td>
<td>0.123</td>
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</table>
Typologies: Countries

Cluster analysis.

Variables

- Calories per day per capita
- Proteins per day per capita (grams)
- Food production per capita (US$ 1989-91)
- Total exports (merchandise and services) over food imports
- Non agricultural population over total population

- 167 countries; 155 WTO (132 members and 23 observers); 44 LDCs; 18 NFIDCs

Levels, standardized (z-scores)

Three methods: hierarchical, k-means, and fuzzy

12 categories of food (in)security
LDCs better at identifying food insecure. But some food insecure not included and it includes some food neutral NFIDCs: not as good as proxy; 1/3 food neutral.

Developing countries are spread over all categories, except the most food secure.

Among food-insecure countries, profiles also differ: rural (mostly in Africa and South Asia) versus urban (LAC and Eastern Europe); “consumption vulnerable” (low levels of consumption of calories and proteins per capita), versus “trade vulnerable” (use large percentages of their exports to buy food)

Developed countries are in the food secure category.

Food insecurity in poor countries is different from trade concerns in developed countries.

New Category: Small and Vulnerable

Out of 45, food insecure 23 (1 Cluster 1; 9 Cluster 2; 8 Cluster 3; 5 Cluster 4)
Typology: Households

Problem is not “food prices” per se but:
Incomes versus Cost of Minimum Household Food Requirements (MHFR)
- Wages*employment (or Prices*Quantity of goods and services sold by the poor)
- Food prices*MHFR

Poverty Line: a mark up on Cost MHFR
- Chronic; transitory, with a lot of “churning”
- “Damaging fluctuations” (persistence?)
- Exposure, Vulnerability, Risk Aversion
- Low productive, human, social capital; low savings
Typology: Households

- **Income side:**
  - Labor and product markets; Land and water distribution; Infrastructure; Livestock and assets

- **Demand side:**
  - Urban (mostly net food buyers) versus Rural (net sellers, seasonal variation net seller/buyer, net buyer)

- **Demographics and health**
  - Female headed
  - Too young, too old
  - Diseases and incapacity

- **Food security different from “nutrition security”**
Price Volatility and Stability

- Monetary policy: 0-2% inflation; now debate about 4% (Olivier Blanchard, IMF)
- Variability of trend and around the trend
- How to define trend?
  - Lineal, log lineal, random walk, Hodrick-Prescott, Christiano-Fitzgerald, M.A.?
- World prices: in what currency? US$, SDRs
- Domestic prices: Relevant markets? Producer prices, consumer prices?
- Nominal versus Real Prices (deflator?)
- Relevant time horizon: annual, seasonally, monthly. Persistence?
- Price shocks (e.g. 2 SD above/below trend)
Inflation: 3 year rolling

-30
-20
-10
0
10
20
30
40
50
60
70

METALS
FOOD
OIL
Impact on Developing Countries

**TREND:**
- **VAR:** increases in world commodity prices associated with growth in LAC and SSA; less clear Asia; MENA in between
- Positive social impact of growth based on metals or energy products appears lower than for other commodities; varies by country
- Agricultural production impact on development seems positive (but depends on commodities, production structures, and consumption shares)

**CYCLE/SPIKE:**
- Concern about sudden increases (mostly food and fuel), with macroeconomic, and poverty impacts: inflation, political unrest.
- Full macroeconomic cross effects of increases in all commodity prices (not only food and fuel) must be considered (fiscal, monetary, inflation, ER)
What’s Trade Got to Do With It? (Tina Turner)

Trade helps, although most of the food consumed is produced domestically (but ratio differs by products...)

- Variability of consumption $<$ production
- Food import bill as % of total exports has declined in general
- World price volatility not larger than before (at least until about late 2007, early 2008)
Trade Policies

- Are categories of countries under WTO rules adequate for analyzing food security?
- Are WTO disciplines and Special and Differential Treatment linked to those categories adequate to address food security concerns?

- Do they force/allow Industrialized Countries to follow “good” policies that help with poverty reduction and food security and to avoid “bad” ones?
- Do they force/allow Developing Countries to do the same?
Limiting “Bad” Policies in IC

- If domestic and export subsidies are reduced and market access increased:
  - Agricultural production, exports and employment expand in developing countries; small countries also benefit (agriculture expands as % of their baseline)
  - Important for DC: Market access; EU adjustment

- Objections
  - Terms of trade (but no historical, dynamic analysis)
  - Erosion of preferences (but there are better ways to maintain margin of preferences or to compensate)
  - Impact on consumer (it depends also on employment effects), and on net importing countries (it depends on overall expansion of trade)
  - Supply-side constraints
  - Exports of cash crops: harmful effects on poverty and food security?
High prices for producers or low prices for consumers?

Perspective of poor producer (multiplier effect of agriculture). But poor consumers need to be considered (urban and rural malnutrition).

No way out of this policy dilemma.
Alternatives in the AoA

- Green box: food safety stocks
- Green box: domestic nutrition programs
- De minimis 10%
- Article 6.2 and subsidies for poor producers.
- Subsidies and countervailing duties
- Export taxes and export bans
  - Symmetric effects of reducing import taxes subsidies to consumers, anticipatory hoarding...? It depends on market share...
Modalities December 2008

- Additional possibilities under Green Box
  - Stockholdings and support to low income producers
  - Insurance, Natural Disasters
  - Regional payments...

- Special Products (Annex F list of criteria)

- Special Safeguard Mechanism

- Food aid (Annex L)

- Small and Vulnerable (only half food insecure):
  - Total trade < 0.16; Non-ag < 0.1; Ag < 0.4

- But...
  - Sensitive products
  - Erosion of preferences
“Green Box measures cost money and are difficult to administer. We need flexibility to protect.”

But protectionism operates as a privately collected, and regressive, tax on food; costs for poor consumers; benefits for large producers.

Increases prices of agricultural inputs to other sectors (primary and agro-industrial), affecting production and employment there.

Higher costs of wage-goods may lead to higher salaries, affecting other export industries.

Impact over real exchange rate (overvaluation).

Effect over technological change, investment, productivity? Unlikely to have large positive gains that benefit the poor.

Conclusions for Trade

- AoA does not constrain good policies in DC to address poverty and food security issues (programs aimed at poor producers or consumers, stocks for food security and domestic food aid for populations in need). DC can have well-defined programs for poverty, food safety and environmental protection.

- But AoA does not constrain much “bad” policies either, in IC particularly... But poor producers are helped by disciplines on subsidized exports.

- The most important constraints are financial and human resources and institutional capabilities in DC.
Poverty and hunger materialize at the household/individual level. Therefore, SDT defined at the national, crop, or even farmer level, may not focus on the main problem.

- Importance of well targeted safety nets for the poor

There is still a need for instruments to protect from import surges and unfair trade practices, and avoid drastic shocks that affect survival strategies of the poor.

- Benchmark for comparison: neutral trade policy plus complementary investments and social policies for poverty alleviation and food security
Conclusions for Trade

Food security more than a trade issue:
- Availability (domestic supply and trade),
- Access (broad-based development)
- Utilization (health, education, women empowerment, democracy)

Adequate policies
- Investment in human capital, infrastructure
- Technology
- Management of natural resources
- Land ownership by small producers and landless workers
- Safety nets (CCT, school lunches, women and infant nutrition, food-for-work)
- Women’s empowerment
- Community organization and participation
- Adequate functioning of product and factor markets
- Macroeconomic stability
- Good governance
- Climate adaptation and mitigation
Other Trade-Related Issues

Exchange rates
- GATT: references to IMF and exchange rates. Particularly, Article XV. Exchange Arrangements. “4. Contracting parties shall not, by exchange action, frustrate the intent of the provisions of this Agreement, nor, by trade action, the intent of the provisions of the Articles of Agreement of the International Monetary Fund.”

Environment
- Carbon tax versus cap-and-trade
During 2000s and until ~ 2007, improving conditions in developing countries as a whole

- High growth per capita (3.9% in 2000s; highest 3.1% in 1970s)
- Low volatility (only 19% in recession; 29% in 1960s and 1970s; CV of consumption, lowest of all decades)
- Low inflation (5.8% against high double digits in 1970s/1990s)
- Improved fiscal position (including declining debt)
- Expansion of water and sanitation. Safety nets (CCT, workfare)
- Empowerment of women (important for nutrition security)
- Expansion of democracy
- Poverty declining as % population
- Percentage children < 5 underweight declined from 33% in 1990 to 26% now (but not enough to achieve MDGs?)
The “Great Recession” of 2009...?

What is the right historical comparison?
- The Great Depression? The 1980s?

**Great Depression**: tight monetary policies implicitly coordinated globally by gold standard (tight fiscal coordinated by ideology)

**1980s**: tight monetary policy in US and Europe (explicit, to combat inflation). Increase in interest rates: 6-7% in real terms over previous levels. Absolute nominal level of about 17%

**Great Recession now**: global expansionary monetary policy and increase in leveraging, leading to an endogenous deleveraging (“credit crunch”):
- Increase in world labor supply (China), leading to low inflation and expansionary policy in industrialized countries
- Accumulation of reserves in developing countries, leading to expansionary monetary policy there, and lowering medium term interest rates in industrialized countries
- Financial and institutional innovation, reducing perception of risk, and increase in leveraging
March 2002 until June 2004
Very low interest rates
Freddie and Fannie collapse.
July 2008

Surprise cut in Fed Rate
September 2007
Looking Forward

- **Short to Medium Term/ Scenario 1: second decline (W)**
  - Markets rate increase because of refinancing needs and/or normalization of fiscal and monetary stimulus; impact on housing market and banks and/or overextended governments.

- **Short to Medium Term/ Scenario 2: slower growth**
  - More regulated financial system, less leverage, more conservative.
  - When worst is over, monetary and fiscal authorities must reverse expansionary policies.
  - Consumers and governments in industrialized countries (particularly US) will have to reduce ratios of debt/income. Need to reduce US current account deficit.

- **Short to Medium term/Scenario 3: inflationary surge and restrictive monetary policy down the road.**

- **Longer Term: challenge of moving from current (2006) provision of food energy (about 28 exajoules) y non-food energy (about 460 exajoules) to population of about 6400 millions, to 39/43 exajoules (food) and 800/900 exajoules (non food), on sustainable basis, for about 9000/10000 million people in 2050.**
Thanks...
Medium Term Projections?

Climate and Environment

* World Sustainable Energy
* Energy and Poverty
* Energy and Food Security
* Energy and Health

Energy

Agriculture

Resource Base
Old Proverb from the Mayas

“It is wise to remember that the energy tiger is eating the macroeconomic dog that is still wagging the trade tail…”
Impact on Developing Countries

- Primary commodities still important component of production, employment, and trade in many developing countries, although declining. Need to look at all commodities, both supply and demand.
- Commodity trade structure very different across developing countries (X, M and NT, for food, fuel and metals)
- Correlations across prices of commodities vary
- Food Imports/Total Exports, declining, but Fuel Imports have increased.
- Need to consider trend, cycles (including spikes), and interactions
Two Crucial Governance Issues

Macroeconomic imbalances and world business cycle: global coordination failure 1
- FMI and strengthened surveillance?
- G-7/8 plus China? G-20 (financial)?
- Something different (Stiglitz and UN Economic Council)?

Energy and climate change imbalances: global coordination failure 2
- What form will take the successor to the Kyoto Agreement?
- Legislation in USA (monitoring GHG in trade partners) and EU (tariffs to non signatories Kyoto)
- Need to increase investments in technology (clean electricity and clean transportation)
- Crucial for development, poverty alleviation and food security: developing countries need support for policy analysis, negotiations and investments
Current Situation and Perspectives

**Now:**

- Better structural position, yet external shock bigger (but on what dimensions? GDP in industrialized, global trade, terms of trade, interest rates and spreads, capital flows?)
- Better policy reaction (the “benefit of normalcy”). *In 1980s* reaction was strong devaluation, tightening monetary and fiscal policies. *Now:* smoother devaluation, somewhat expansionary monetary and fiscal policies, no banking crisis (so far…), better safety net programs
- G-20 process; expansionary monetary and fiscal policy in industrialized countries; expansion of lending in IFIs (including SDRs) and more flexible conditions
- Therefore, better performance for agriculture and poverty indicators

**Future:** VLU and other projections…
<table>
<thead>
<tr>
<th></th>
<th>Agriculture</th>
<th>Food</th>
<th>Raw materials</th>
<th>Beverages</th>
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<tr>
<td><strong>t−1 years</strong></td>
<td>72.2</td>
<td>25.5</td>
<td>80.3</td>
<td>33.0</td>
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<td>87.7</td>
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<td><strong>t−4 years</strong></td>
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<td>111.3</td>
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<tr>
<td><strong>t+1 years</strong></td>
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<td><strong>t+2 years</strong></td>
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<td>na</td>
<td>−0.7</td>
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<tr>
<td><strong>t+3 years</strong></td>
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<td>10.8</td>
<td>na</td>
<td>−9.7</td>
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Inflation Agriculture

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<td>−9.7</td>
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## Inflation: Specific Products

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### Inflation: Several Commodities

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<td>Region</td>
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<td>South Asia</td>
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<tr>
<td>Sub-Saharan Africa</td>
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<td>+</td>
<td>0</td>
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Primary Commodities Price Variation

Annual Change (%)

-100
-50
0
50
100
150
200


METALS AGR. RAW MATERIALS FOOD OIL
Other issues/problems

- War and conflict
- Financial and economic instability and debt problems
- HIV/AIDS and other global health issues
- Global environmental issues
Cycles and Crisis

The food price spike in 2008, smaller than mid 1970s, and now reversed (partially) by recession.
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Old conflict in agricultural policies

- High prices for producers vs low prices for consumers
- Developed countries make consumer and taxpayer pay producers (Japan >90% paid by consumers; EU and USA aprox. 50/50%; OECD 1999)
- Developing countries historically low prices for urban population and industrialization. And now? Lack of definition, affecting domestic policies and trade positions
- Perspective of poor producer (multiplier effect of agriculture). But poor consumers need to be considered (urban malnutrition)
CONCLUSIONS

- Development and poverty alleviation not helped by protection that operates as taxes on food (with the greater burden falling on poor consumers).

- Still there is the need of instruments to protect from import surges, and poor countries may ask DCs to first reduce protection to their levels.
Addressing the Needs of the Most Vulnerable

- Special consideration when consumption falls below some pre-specified levels
- Food aid counter-cyclical and focused
CONCLUSIONS

Global problems:

- Agricultural protectionism in developed countries
- Financial instability and debt problems. Heavily Indebted Poor Countries Initiative
- War and conflict
CONCLUSIONS

Food security a domestic issue:
- Availability (domestic supply and trade),
- Access (broad-based development)
- Utilization (health, education, women empowerment, democracy)

Adequate policies
- Investment in human capital, infrastructure
- Technology
- Land ownership by small producers and landless workers
- Community organization and participation
- Adequate functioning of product and factor markets
- Macroeconomic stability
The Concerns

1. Increase in the food bill of net importing countries.
2. Erosion of trade preferences.
3. Export expansion and possible harmful effects on poverty and food security.
4. Supply-side difficulties to take advantage of opportunities.
Developing Countries

- Most of the food produced internally, but
- Trade can help

![Agriculture: Imports/Production](chart)

**Agriculture: Imports/Production**

- **Diving w/o China**
- **Industr**
Complementary Policies

- Human capital (education and health)
- Infrastructure
- Technology
- Land ownership
- Community organization and participation; social capital
- Women’s empowerment
- Management of natural resources
- Functioning of product and factor markets
- Macroeconomic stability
- Good governance
WTO Negotiations

- Developing countries: industrialized countries to reduce their high levels of protection and subsidies.
- Define better categories with objective indicators of food security.
- Some changes in language in the Agreement on Agriculture for food security reasons.
Legal or money problem?

- Main problem is less a legal one
- Focus on the need to increase financial and institutional resources for investments in
  - rural development
  - poverty alleviation
  - food security
  - nutrition and health
Other Global Problems

- Food aid: counter-cyclical, cash, focused, developmental objectives
- Financial instability and debt problems. Heavily Indebted Poor Countries Initiative
- War and conflict
- HIV/AIDS and other health issues
- Global environment
Complementary Policies

- Protectionism operates as a tax on food; highest costs for poor consumers; largest benefits for big producers.

- Best approach: neutral trade policy plus complementary investment and social policies for poverty alleviation and food security.
WTO Negotiations

- Industrialized countries to reduce their high levels of protection and subsidies

- Define better categories with objective indicators of food security
  - Cluster analysis of food (in)security situations

- Some changes in language in the AoA for food security reasons
WTO Negotiations

“Offense”. Address the issue of agricultural protectionism and subsidies in industrialized countries. Protectionism and high subsidies in industrialized countries hurt production and employment opportunities for developing countries.

“Defense”. Some changes in language in the Agreement on Agriculture for food security reasons.
Protection versus Technology

CGE world model. 46 countries/regions. 37 sectors.
Unemployment

TFP growth over time depends on government expenditures in agricultural technology and return on those expenditures.

- \( TFP_t = TFP_0 \times (1 + g)^t \)
- \( g = F_2 \) (IRR; GovExpR&D/AgGDP)
- IRR to agricultural research form Alston, J. et al 2000. Shares from ISNAR/IFPRI

Scenario 1. Increase protection by 50% on cereals in countries/regions supporting special products. Calculate the total tax on consumption (implicit and explicit).

Scenario 2. Impose an explicit tax (now all collected by the government) for the same amount (balanced budget). Utilize the funds to expand investments in agricultural technology.
Protection versus Technology

- Decline in GDP and employment (but small as percentage) as result of protection.
- Decline in consumption/utilization of food (because of price increases and reduction in imports). Food security affected.
- Agricultural trade among developing countries, including those applying higher levels of protection.
- Investment leads to welfare, production, employment, and food consumption gains.
Protección y subsidios expanden producción agropecuaria...

...pero impacto PBI, empleo, pobreza?

Protección incrementa precios de productos agropecuarios que son insumos de otros sectores (primarios, agroindustria), y afecta producción y empleo

Protección lleva a alimentos más caros que promueven aumentos salariales que pueden comprometer otras industrias de exportación

Impacto negativo sobre precios alimentos que son un porcentaje importante del gasto de familias pobres. Impuesto regresivo que reciben productores grandes y afecta más a consumidores pobres

Efecto sobre el tipo de cambio real

Efecto cambio cambio tecnológico
Resultados Agregados II

- Ejemplo Marruecos: mayor vulnerabilidad climática, mayores costos salariales, mayores costos fiscales por subsidios a alimentos


  - Escenario 1. Aumentar protección en X% en cereales en países que apoyaban Development Box. Calcular el impuesto total sobre consumo (implícito y explícito).

  - Escenario 2. Colocar un impuesto explícito por el gobierno por la misma cantidad y utilizar los fondos para expandir inversiones en tecnología agropecuaria

- Pero países en desarrollo necesitan instrumentos para atender cambios bruscos en importaciones y prácticas comerciales desleales
Impacts

- **Agriculture**
  - Differentiate by tradability, main market, source of inputs
  - Export crops benefitted by devaluation
  - Domestic market, higher income elasticity, and dependence on imported inputs more affected
  - Banking crisis (credit crunch). Fiscal crisis

- **Poverty**
  - Employment, wages and incomes (urban/rural; formal/informal)
  - Prices of food and other items in consumption basket of the poor
  - Government services and safety net. Impact on human capital
Food Security and Nutrition Security

- Food availability and access at the national level
  - domestic supply and trade
- Food security at the household level
  - broad-based, equitable development
- Nutrition security at the individual level
  - food availability and access
  - women’s education and empowerment
World Growth and Trend (1960-2009)

2008 estimated and 2009 projected

World Growth Trend

2008 estimated and 2009 projected

World Growth

Trend

2008 estimated and 2009 projected

World Growth

Trend
Results 1980s

- **Growth total 1982/3 (%)**
  - LAC: -1.8
  - Developing: 2.0
  - World: 1.6

- **GDP Agriculture (%)**
  - LAC: -0.1
  - Developing: 3.6
  - World: 2.3

- **Poverty (US$ 2/day as % of population)**
  - LAC and SSA increased poverty by 10/20% in mid 1980s. In the rest of developing countries poverty continued **declining**.
New Categories: Small and Vulnerable

Out of 45, food insecure 23 (1 Cluster 1; 9 Cluster 2; 8 Cluster 3; 5 Cluster 4)

New IFPRI Factor Analysis (Yu, You, Fan, 2010) food insecure 15 (3 lowest, 12 low)