Investing in Agriculture

to End Hunger and Extreme Poverty

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Agriculture – a driving force in human development for millennia
• food, fiber, fuel, medicine, and essential consumables
• surpluses and trade led to income, specialization and services
• structural transformation to manufacturing and services
Outline

- The Case for Investing in Agriculture
- Asian Green Revolution
- African Green Revolution
- Focus Topics in Agriculture
  - Climate Change
  - Input subsidies
- Outlook for Global Food Security
The Case for Investing in Agriculture to End Hunger and Extreme Poverty

- Of 5.5 billion people living in developing countries, 3 billion live in rural areas
- 500 million small farms in developing countries, supporting 2 billion people
- 75% of the world’s poor are rural
- Rural poverty rates (29 percent on average) are substantially higher than urban rates (13 percent)
- Most of the rural poor depend on agriculture for livelihoods and food

The poor are mainly rural and they are mostly small-scale farmers ("smallholders")
Can we be optimistic?

• Knowledge now exists in improve agricultural productivity in most settings
• IRR of 43% from 700 agriculture R & D projects
• Urbanization and increased trade opening opportunities for expanding agricultural output: demand for cereals and meat will increase by 50% and 85% respectively by 2030
• Multiplier effects of agricultural productivity improvement are well established

...but are these factors reflected in public investment?
Harsh Reality of Agricultural Investment

• Decline in rural poverty mainly in East and Southeast Asia; but in South Asia and Africa, rural poverty has worsened
• Hungry people now exceeds 1 billion
• Food prices still 25% above pre-crisis levels in most poor countries
• Poor countries spend just 4% of their national budgets on agriculture
• Donor allocations to agriculture down from 18% in 1979 to 4.6% in 2007
So why invest in agriculture?

• Large size of rural poor sub-sector: 2 billion people living on smallholdings
• Past successes illustrate potential economic impact: agriculture as precursor of economic development: Europe, Japan, Latin America, Asia
• Impacts on food security, incomes, and social indicators (health, education)
• Agricultural countries, especially with low income, are clearly under-investing
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- **Asian Green Revolution**
- African Green Revolution
- Focus Topics in Agriculture
  - Climate Change
  - Subsidies
- Outlook for Global Food Security
Food Production Growth Since 1961

Net per capita Food (PIN) - indexed to 100 in 1961 (base 1999-2001)

AFRICA SOUTH OF SAHARA+  EAST & SOUTH EAST ASIA+  SOUTH ASIA+  WORLD+
Background to the Asian Green Revolution

- Population’s food needs were met by land area expansion, but there are limits to growth
- First half of 20th century advances in science and technology
- English wheat: 0.5 to 2.0 t/ha took 1,000 years; 2.0 to 6.0 t/ha took 40 years
- But progress slow in tropics: colonial neglect of food crops
- Mid-1960s, hunger and malnutrition widespread in tropics

“The scale, severity and duration of the world food problem are so great that a massive, long-range, innovative effort unprecedented in human history will be required to master it.”

U.S. President’s Science Advisory Committee, 1967
• In 1940s and 1950s Rockefeller and Ford Foundations took the lead in establishing research to adapt science to tropics
• International Rice Research Institute (IRRI) and International Maize and Wheat Research Institute (CIMMYT) established in 1960 and 1962
• CGIAR
Science Strategy behind the Asian Green Revolution

• Focus on major food crops: rice comprises 23% of consumed calories, wheat 17%, and maize 10%.
• New plant architecture and physiology for rice and wheat: change in harvest index
• Short stiff straw, responsive to fertilizer, earlier maturing to allow multiple cropping
• Yield stability and better eating quality were added
Food Production Growth Since 1961

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- AFRICA SOUTHERN OF SAHARA
- EAST & SOUTHEAST ASIA
- SOUTH ASIA
- WORLD

Production of unmilled rice (million tons)  Real price of milled rice (2008 US$/ton)

World production

Real price

Year


Source: Production: USDA, 13May2008
Rice Price: 2008 is May 2008 price. Relate to Thai rice 5%-broken deflated by G-5 MUV Index deflator (adjusted based on April 17, 2008 data update)
Source: www.worldbank.org
Impact of Asia’s Green Revolution

- Increasing productivity of agriculture though use of improved technology, supportive policies and institutions, and public investment
- Household food security and surpluses for sale
- Lower food prices for consumers and higher real wage rates for rural and urban workers
- Cereal production more than doubled in Asia bet 1970 and 1995
- Poverty declined from 50% to 18% between 70s and 2004; hunger declined from 30% to 16%
- Crisis averted and created the foundation for economic transformation and growth in Asia
But there are criticisms

- Negative environmental impacts: increased use of pesticides and fertilizers
- Inequitable benefits: farm size, landless, irrigated versus rain-fed, intra-household distribution
- Declining profitability as productivity increased
- Grain quality/taste
- Political/ideological arguments of increased economic dependency on multi-nationals
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Why did the Green Revolution not reach Africa?

- Diversity of African agriculture
- Rice and wheat not important crops
- African crop land is 96% rain-fed
- Health burden, especially malaria
- Poor transport infrastructure
- Low population densities
- Political instability and urban bias
- Structural adjustment and failure of markets to develop
- Lack of investment by governments and donors (WB)
A Short History of the African Green Revolution - 1

• False starts in Kenya and Zimbabwe
• Achieving MDG 1 – UN Millennium Project Hunger Task Force Report
• Kofi Annan’s call for a “uniquely African Green Revolution” (5th July 2004)
• Malawi doubles maize in 2006 through an innovative inputs subsidy program
• Africa fertilizer summit, Abuja 2006
• Alliance for a Green Revolution in Africa (AGRA) formed in 2007
• Business interest expands: Yara Prize; World Economic Forum
A Short History of the African Green Revolution - 2

• World Bank declared agriculture a top priority (WDR 2008)
• UN MDG Africa Steering Group endorsed plans to support an African Green Revolution (10\textsuperscript{th} March 2008)
• Madrid High Level Meeting (January 2009)
• US Government interest in addressing food security through smallholders
• L’Aquila declaration
L’Aquila Declaration

endorsed by the G8, other governments, African Union, UN, World Bank, and many others

• We, Heads of State, Government and International and Regional Organizations convened in L’Aquila, remain deeply concerned about global food security, the impact of the global financial and economic crisis and last year’s spike in food prices on the countries least able to respond to increased hunger and poverty.

• There is an urgent need for decisive action to free humankind from hunger and poverty. Food security, nutrition and sustainable agriculture must remain a priority issue on the political agenda.

• We therefore agree to act with the scale and urgency needed to achieve sustainable global food security.

• We will aim at substantially increasing aid to agriculture and food security including through multiyear resource commitments. In this respect, we welcome the commitments made by countries represented at L’Aquila towards a goal of mobilizing $20 billion over three years through this coordinated, comprehensive strategy focused on sustainable agriculture development.
Science Strategy Behind the African Green Revolution: Work in Progress

• Address soil fertility: requires a combination of inorganic and organic nutrient sources
• Increase irrigation (blue water) and improve rainfed water capture and management (green water)
• Develop and adapt varieties for African conditions
• Include livestock and trees in the mix
• Build in adaptation to climate change
• Build in recognition that women do most of the farming
• Build in recognition that on-farm production is an important source of nutrition
• Take a more holistic integrated multi-sectoral approach: Millennium Villages
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The Threat of Climate Change

• IPCC Fourth Assessment Report
• High dependence on agriculture for food security and livelihoods; most of the poor are in rural areas
• Africa considered highly vulnerable to climate change and variability: “multiple stresses”, weak adaptive capacity
• Agriculture affected by reduced growing seasons that shift the boundaries of marginal farming
• Rainfed crop yields down by 50% in some countries
• 75-250 million Africans face increased water stress by 2020; arid and semi-arid areas to expand
• Critical disease interactions – malaria likely to get worse

Conclusion: Centrality of agriculture means that African livelihoods and economies are highly vulnerable to climate change
Broader Policy Implications for African Agriculture

• Opportunities exist for both adaptation and mitigation – but priority for action in Africa on adaptation
• Redouble efforts to improve agricultural productivity in all major environments
• More favorable areas are critical for national and regional food security
• Less favorable areas are most vulnerable to shocks...people living on the margin
• Partnerships to exploit the synergies within and beyond agriculture...not just about agriculture
Investing in Adaptation: Some Practical Solutions

• Intensification of food crop production by smallholders: improved access to inputs (seed, fertilizer, water)
• Shifts in crop and varietal selection towards greater drought/temperature tolerance and pest and disease resistance (CGIAR/AGRA)
• Grain storage improvements to ensure carryover stocks and access to surpluses
• Enterprise diversification towards higher value products and off-farm employment
• Water harvesting and better water management
• Forecasting and timely advice
• Weather-related insurance
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Improving Smallholder Maize Productivity in Malawi

- 78% labor force in agriculture sector
- 2.5 million smallholders, average cultivated land 1 ha
- Maize (rainfed) grown and consumed by 97% farming households
- Contributes 60% total calories
- Maize-producing households operate at sub-subsistence level
- National yields averaged 1.2 MT/ha over past 20 years
- Soil nutrients depleted, especially N
Malawi Takes Action!

• Failure of 2004/5 rains and delayed inputs...the worst maize harvest in 10 years
• Aug 2005, Government requested donor support for inputs; UN Appeal for food aid and inputs
• Donors unresponsive on inputs
• Government reallocated $60 million for an inputs subsidy program
• Voucher system enabling smallholders to access seed and fertilizer
• Repeated for 4 successive years... 4 successive bumper harvests
• 2009 saw a 1.3 million ton surplus
Broader impact

- Increased national food security
- Greatly reduced level of household food insecurity (down from 5 mil to 500,000 at risk)
- Higher wage rates (up 50%) and lower maize prices
- Increased local economic activity
- Better health, higher school attendance
- Export earnings
- Social and political stability
Lessons

• Political leadership and action -- grounded in strong science -- make a difference
• Knowledge already exists to increase maize productivity and to achieve food security
• National scale implementation is feasible
• Input subsidies were expensive but necessary
• Consumers are benefiting from *relatively* lower food prices; buffered from the food riots
• Donors and other countries now rethinking their strategies based on Malawi’s experience with *smart subsidies*
Remaining Challenges for the African Green Revolution

• Rainfall variability and climate change
• Soil fertility management: organic/inorganic
• Post-harvest losses
• Diversification to higher value crops
• Research capacity
• Financing
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Outlook for Global Food Security

• Widely shared view that hunger and malnutrition are getting worse and need urgent attention
• More than 1 billion people chronically undernourished (100 million more than in 2008)
• Setting of volatile food and energy prices...resumption of growth may mean higher energy, fertilizer and food prices
• Formal ODA commitments substantial since the Rome Food Summit but no evidence of impact or even disbursement on the ground
• Food aid and safety nets needed for the most vulnerable
• Many countries have sound but unfunded plans to improve agricultural productivity and food security
• Existing mechanisms for approval, disbursement and delivery of ODA are not simply working
• New approaches and even new mechanisms are needed in times of crisis: Global Fund for Smallholder Agriculture
Dr. Norman Borlaug
Nobel Peace Prize Laureate 1970

The potential is there, but you can’t eat potential!