The African Green Revolution Takes-off
Progress Report

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21st Century African Green Revolution

SEMINAR ON INNOVATIVE APPROACHES TO MEETING THE HUNGER MILLENIUM DEVELOPMENT GOAL IN AFRICA
JULY 05, 2004 ADDIS ABABA

AFRICA'S GREEN REVOLUTION
A Call to Action
92% suffer from chronic malnutrition

8% from extreme events: famines, wars

Major donor Ethiopia (2003):
$5 million for chronic malnutrition
$400 million for famine

815 million people
Also Known As

- Doubly Green Revolution (Conway)
- Evergreen Revolution (Swaminathan)

- Controversial---- like Borlaug, Swaminathan, Subramanian, Chandler, Havener etc. were in the 1960’s –70’s
Edson Lobato at Cerrado Center ~ 1974
Basis for the African Green Revolution
Africa’s Per-capita Food Production Turning Around

Agriculture (PIN)
Working at Different Scales

Global

National

Community
2006: Much Progress

- MDG’s widely accepted; increasing momentum
- African Green Revolution is on
- Agriculture is back in the donors’ agenda
- Soil health, small-scale water management are now mainstream
- Transgenic crops becoming acceptable
- Large-scale distribution of long-lasting bednets; ARV’s—the health revolution
- Grass-roots getting involved: churches, youth, celebrities, media
- Private philanthropy: major funding, leading the way
- Private sector: becoming a full partner
Business Coalition Against Hunger
Paradoxes

- Donor country commitments vs. lagging delivery
- Market-based development focus vs. first getting out of the poverty trap
- “Small farmers not viable” vs. Asian Green Revolution experience
- Subsidies for the rich vs. no subsidies for the poor
- Land expansion not possible vs. land increases in small farms
- Investing at the front end of the food chain vs. at the tail end
Donor Investment Options for the Chronically Hungry: Malawi 2005

Invest in the front end: $40/family

Food aid: $400/family
Changing the Development Paradigm

- Real investments on the ground vs. feeding the development establishment (35 vs. 65%)
- Coming to grips with food aid vs. food security
- Countries with MDG-based budgets
- Markets functioning for the poor
- Fix the infrastructure, once and for all
- Invest at scale and for the long run
- Economic transformation—from sub-subsistence to rural entrepreneurs
Working at Different Scales

Global

National

Community
Malawi’s Green Revolution started 2005:

- 75% subsidy for hybrid maize and fertilizer
- 147,000 tons of fertilizer + 60,000 tons of improved maize. Cost $50m ($15m from donors)

Maize production doubled nationwide (1.3 to 2.61 m tons of maize), due to yields doubling (0.8 to 1.6 tons/ha)

2006: policy continues
Challenge: more distribution through agrodealers
Ethiopia

- Food production (cereals and pulses) doubled in past 10 years
  - 1993: 5.9 million tons
  - 2003: 10.4
  - 2006: 23.2 (2010 target=24)

- Paraprofessional agricultural extension and community health workers in 15,000 villages

- Access to markets improving
Working at Different Scales

Global

National

Community
Millennium Villages

Proof of Concept
Empowering African villages to achieve all MDGs

Sauri Sublocation
Siaya District, Nyanza Province
Kenya

Koraro Tabia
Hawzen Woreda, Tigray Region
Ethiopia
All MDGs 110 US$/capita/yr:

- Household share: 10
- Government Share: 30
- Donors share: 70, of which:
  - Agriculture & nutrition: 15%
  - Health: 30%
  - Infrastructure: 20%
  - Education: 20%
  - Water, sanitation, environment, others: 15%
Millennium Villages Science Coordinators
Community leads / Science-based
Sauri: February 2005 Planting

Outside:
Targeted, smart subsidies with payback to school meals program

- diminishing each year
- to be handled through agrodealers
## Staple Food Production—First Year

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sauri</strong></td>
<td>1.9 tons/ha</td>
<td>4.9 tons/ha</td>
<td>2.6x</td>
</tr>
<tr>
<td><strong>Kenya</strong></td>
<td>in 229 ha</td>
<td>in 327 ha</td>
<td></td>
</tr>
<tr>
<td><strong>(Maize)</strong></td>
<td>= 435 tons</td>
<td>=1602 tons</td>
<td></td>
</tr>
<tr>
<td><strong>Koraro</strong></td>
<td>0.13 tons/ha</td>
<td>0.58 tons/ha</td>
<td>4.5x</td>
</tr>
<tr>
<td><strong>Ethiopia</strong></td>
<td>in 1067 ha</td>
<td>in 1979 ha</td>
<td></td>
</tr>
<tr>
<td><strong>(Teff, wheat, maize, others)</strong></td>
<td>= 138 tons</td>
<td>=1163 tons</td>
<td></td>
</tr>
</tbody>
</table>

### Explanation:
- **Sauri, Kenya**
  - **Maize**
  - 2004: 1.9 tons/ha in 229 ha = 435 tons
  - 2005: 4.9 tons/ha in 327 ha = 1602 tons
  - Increase: 2.6x

- **Koraro, Ethiopia**
  - **Teff, wheat, maize, others**
  - 2004: 0.13 tons/ha in 1067 ha = 138 tons
  - 2005: 0.58 tons/ha in 1979 ha = 1163 tons
  - Increase: 4.5x
<table>
<thead>
<tr>
<th>Location</th>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2005/2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mayange, Rwanda (Maize)</td>
<td>2005</td>
<td>0.3 tons/ha in 80 has = 24 tons</td>
<td>3.7 tons/ha in 440 ha = 1,628 tons</td>
<td>12.3x</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>3.7 tons/ha in 440 ha = 1,628 tons</td>
<td>6.5x</td>
<td></td>
</tr>
<tr>
<td>Mwandama, Malawi (Maize)</td>
<td>2005</td>
<td>0.8 tons/ha in 2175 has = 1749 tons</td>
<td>5.2 tons/ha in 3841 has = 19,973 tons</td>
<td>6.5x</td>
</tr>
<tr>
<td></td>
<td>2006</td>
<td>5.2 tons/ha in 3841 has = 19,973 tons</td>
<td>1.8x</td>
<td></td>
</tr>
</tbody>
</table>
Millennium Villages Year 1:
120,000 people have enough to eat

- Sauri, Kenya: 55,000
- Koraro, Ethiopia: 5,000
- Mayange, Rwanda: 5,000
- Mwandama, Malawi: 65,000

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- Total: 130,000
- Estimate 8% still food insecure
- 120,000
# Partitioning the Yield Increases

**Koraro, 2005**

**Teff yields (kg/ha)**

<table>
<thead>
<tr>
<th>2004 drought year</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Due to good rainfall</td>
<td>+326 (3.4x)</td>
</tr>
<tr>
<td>Due to fertilizer alone</td>
<td>+179 (1.4x)</td>
</tr>
<tr>
<td>Due to fertilizer with improved seed + training</td>
<td>+472 (2.1x)</td>
</tr>
<tr>
<td>Overall (2005 improved seed + fertilizer + training) – 2004 yields</td>
<td>+798 (9.4x)</td>
</tr>
</tbody>
</table>
Partitioning the Yield Increases
Mwandama Cluster, Malawi
(Maize yields tons/ha)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Yield (tons/ha)</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004/5 Drought year</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>2005/6 Good rains, no inputs</td>
<td>2.21</td>
<td>2.8 x</td>
</tr>
<tr>
<td>2005/6 Good rains + fertilizer + hybrid seed + “Sasakawa” plant spacing</td>
<td>5.18</td>
<td>2.3 x</td>
</tr>
<tr>
<td>Overall effect</td>
<td>5.18</td>
<td>6.4 x</td>
</tr>
</tbody>
</table>
Cereal Banks: doubling prices

Agrodealers
Microfinance
Crop insurance
Next Season: Agroforestry
Small-scale Water Management
Flour Mill
Sauri Village Builds a Clinic in 6 weeks for less than $10,000
Bednet distribution
This will not happen again
Nutrition: Homegrown Feeding Programs

- Balanced nutrition
- Suits local tastes
- Increases local food demand (+25% maize; pulses, livestock products, horticulture: several fold)
- Much more effective than food aid
Energy Interventions: For cooking
Ruhiira, Uganda Cluster Source of Drinking Water
Safe Drinking Water
Village Truck-Koraro
Prime Minister Meles:
Koraro road
Transformation from Sub-subsistence to Small-scale Entrepreneurs
A 170-house town just built in Koraro
Wireless Internet

Access Point (AP) cluster

Subscriber Module (SM)

Backhaul Module (BH)
Confucius Proverb

- Give people a fish and they will eat for a day
- Show them how to fish and they will eat for a lifetime

- **Dependency** (food aid)
- **Empowerment** (hunger elimination)
Confucius Proverb Updated

- Give people a fish and they will eat for a day
- Show them how to fish and they will eat for a lifetime
- And.. they will buy fishing equipment

- Dependency (food aid)
- Empowerment (hunger elimination)
- Trade (poverty elimination)
The Plane Has Taken Off

- Pilot & copilot
- Flight engineers
- Flight attendants
- A better airplane
- Fuel
- Food
- Frequent fliers
- Those who haven’t purchased tickets