

# **The African Green Revolution Takes-off Progress Report**

**World Food Prize Symposium**

**Des Moines, Iowa**

**20 October 2006**

**Pedro Sanchez**

**Center for Tropical Agriculture and the Rural Environment**

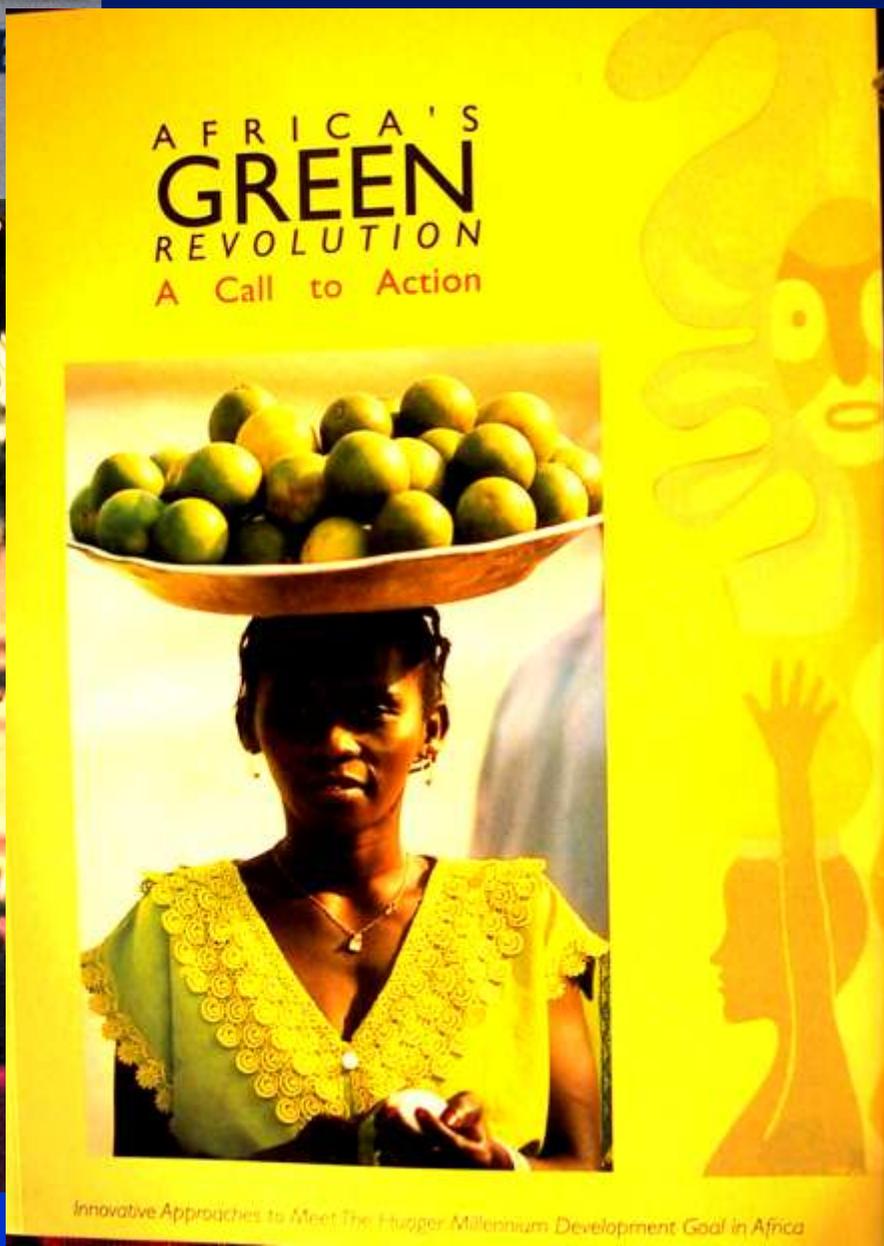
**The Earth Institute at Columbia University**

**UN Millennium Project Task Force on Hunger**

**[www.millenniumpromise.org](http://www.millenniumpromise.org)**

# 21<sup>st</sup> Century African Green Revolution

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





**815 million people**

**92% suffer from chronic  
malnutrition**

**8% from extreme events:  
famines, wars**



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

# Components

## Agriculture



## Nutrition



## Markets



## Environment



## Politics



## Policies



## **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

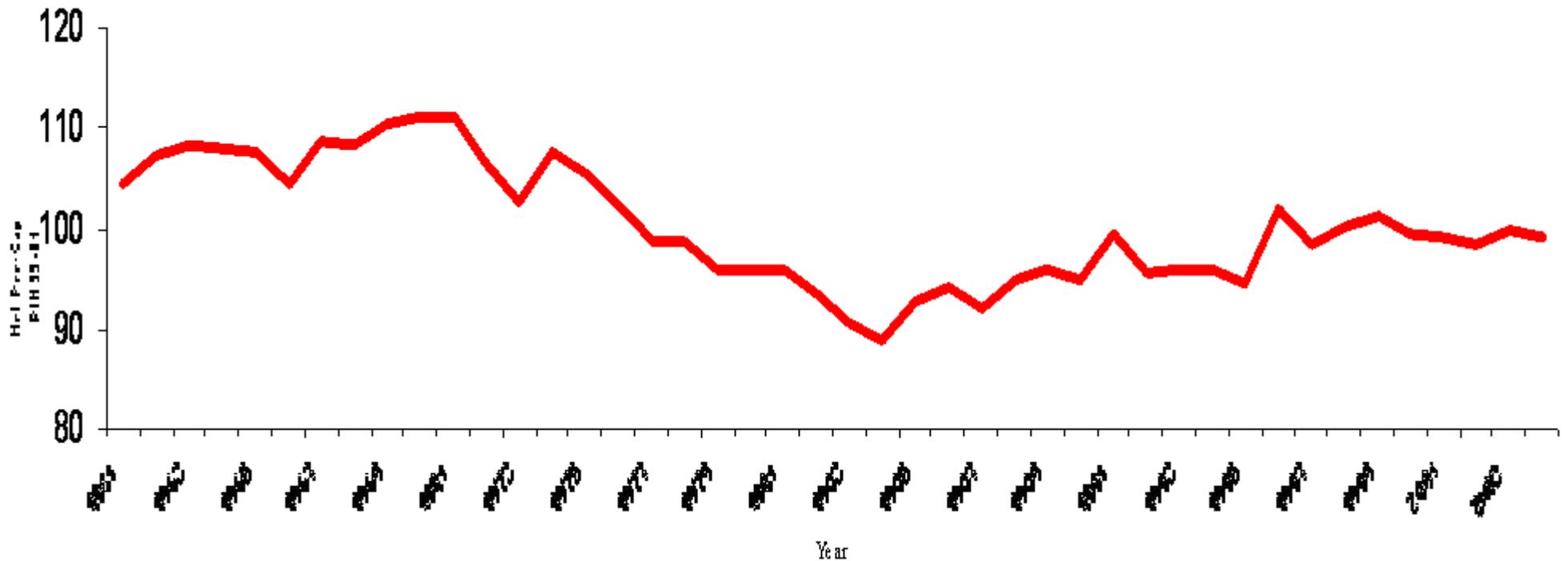
## Basis for the African Green Revolution



# Africa's Per-capita Food Production Turning Around

Africa 1961-2004

— Agriculture (PIN)



# Working at Different Scales

**Global**



**National**

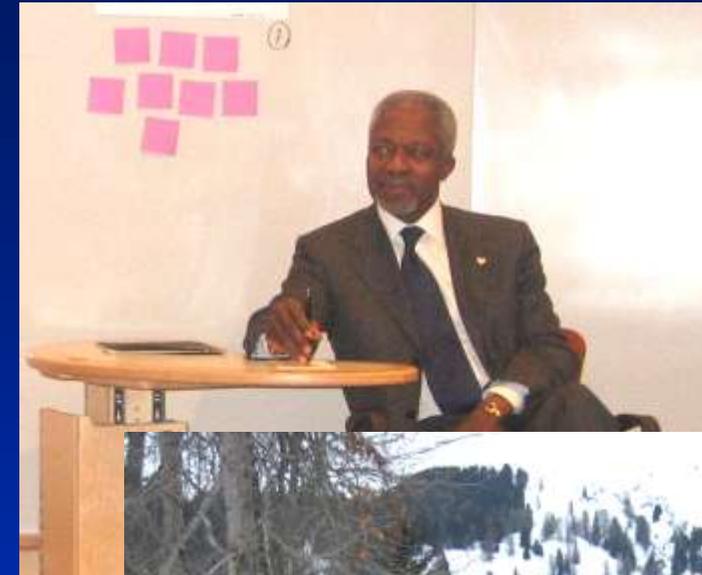


**Community**

## **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**

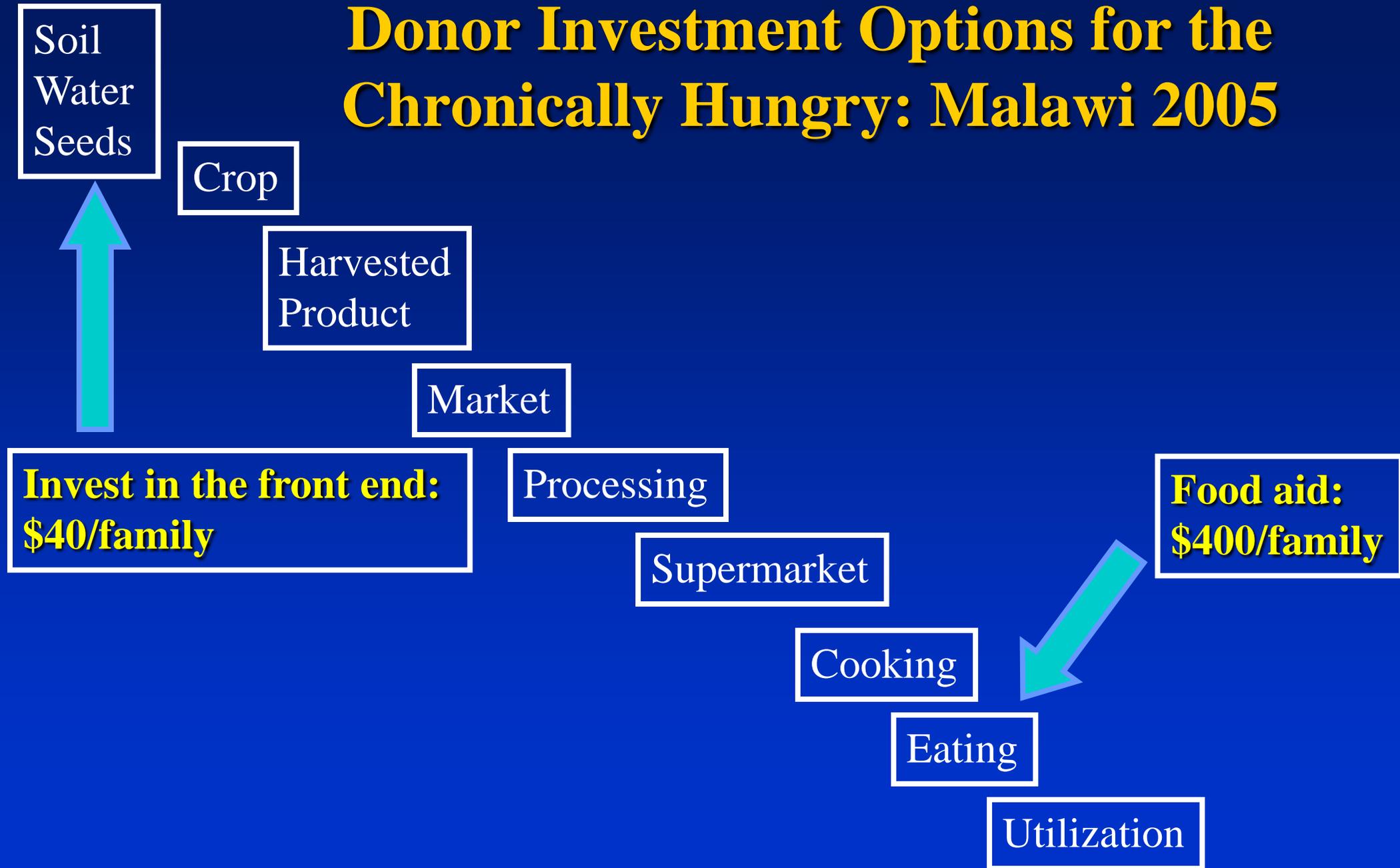
# Business Coalition Against Hunger



# Paradoxes

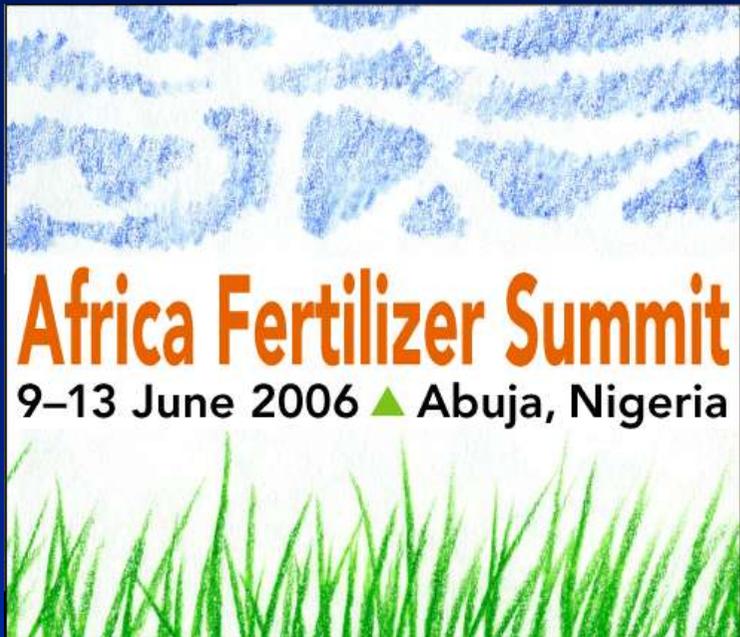
- Donor country commitments vs. lagging delivery
- Market-based development focus vs. first getting out of the poverty trap
- “Small farmers not viable” vs. Asian Green Revolution experience
- Subsidies for the rich vs. no subsidies for the poor
- Land expansion not possible vs. land increases in small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

# Donor Investment Options for the Chronically Hungry: Malawi 2005



# 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



**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



# Government, Industry, UN, Working Together



# 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**



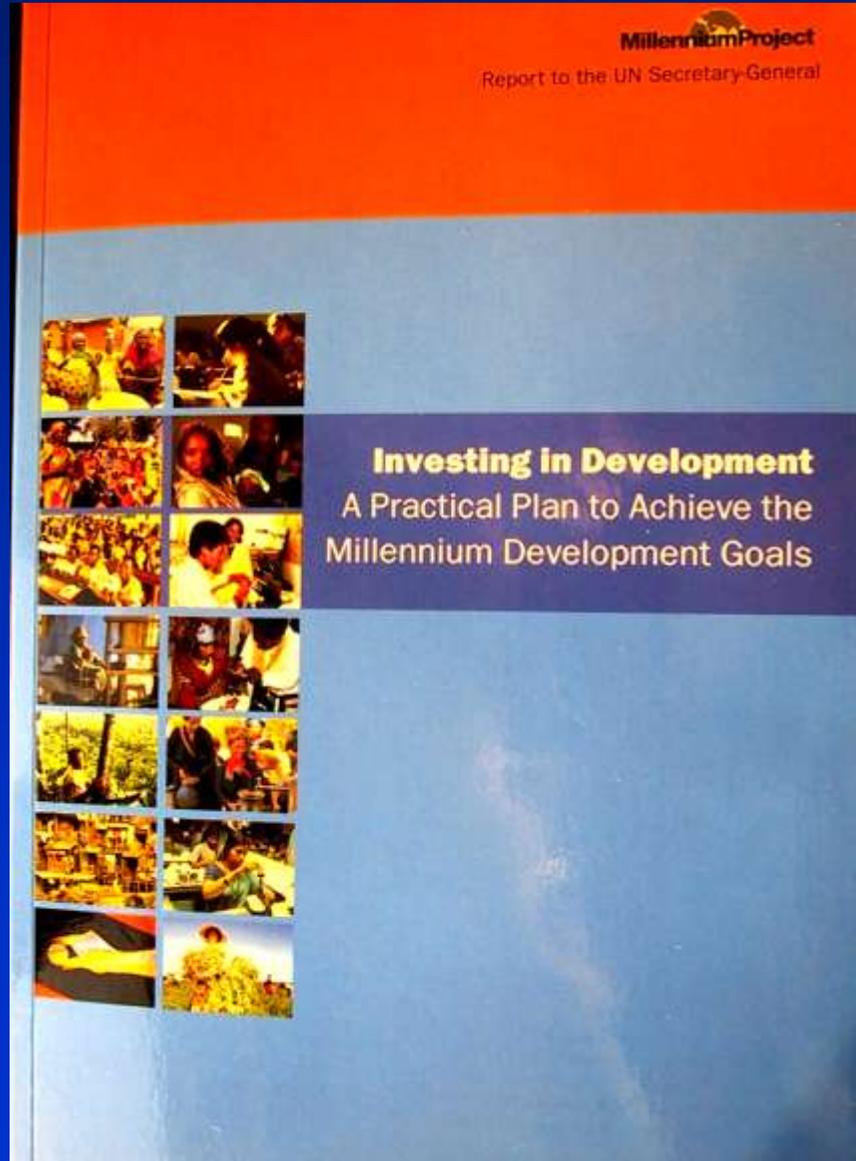
**Koraro Tabia  
Hawzen Woreda, Tigray Region  
Ethiopia**

# UN Millennium Project Recommendations

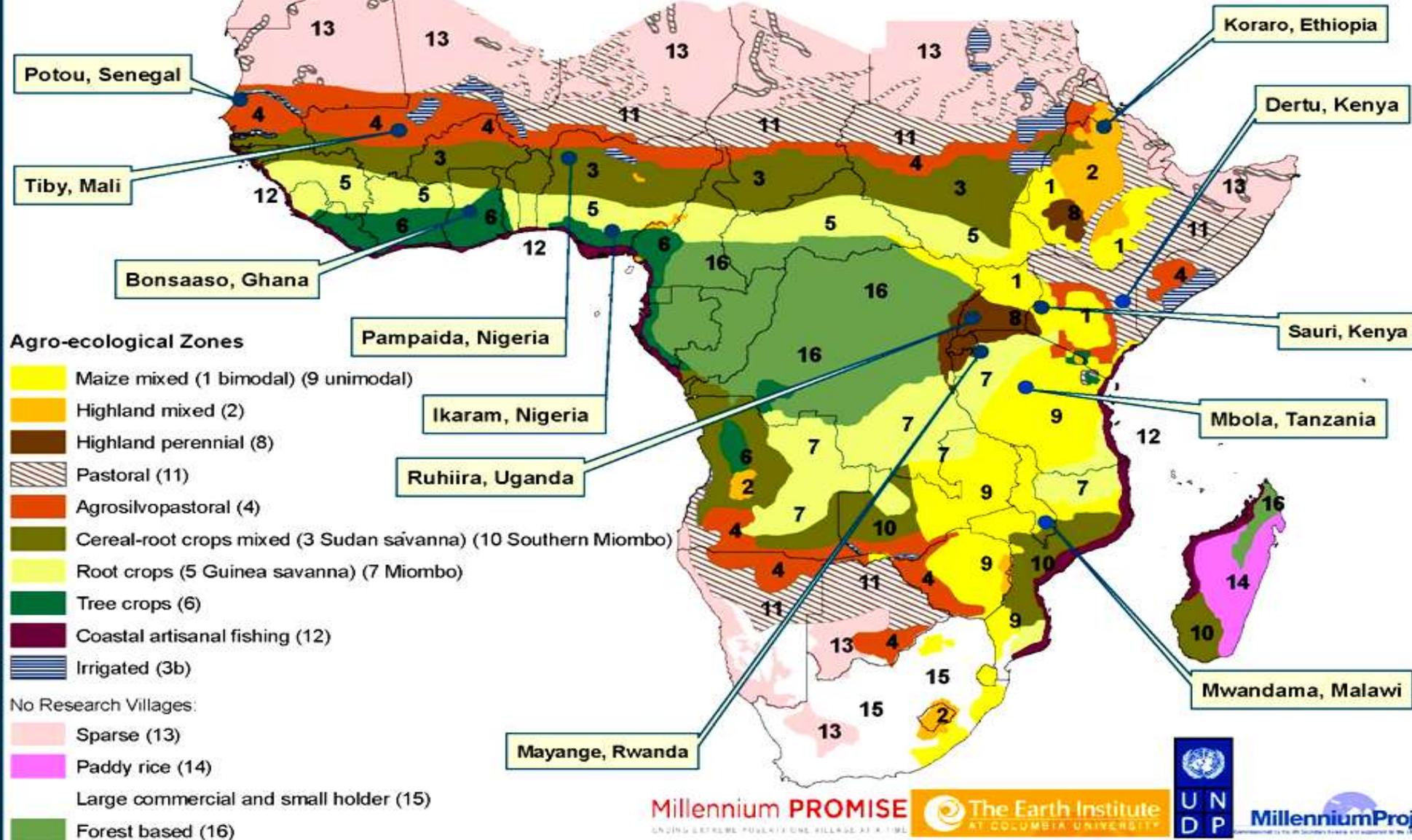
## Estimated Costs: Rural Africa

**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



Adapted from Dixon et al. 2001. Farming Systems and Poverty. FAO

Millennium PROMISE

The Earth Institute  
AT COLUMBIA UNIVERSITY



MillenniumProject

May 1, 2006

# Millennium Villages Science Coordinators



# Community leads / Science-based



# Sauri: February 2005 Planting



Outside:





# Staple Food Production—First Year

<b>Sauri Kenya (Maize)</b>	<b>2004</b> 1.9 tons /ha in 229 ha = 435 tons	<b>2005</b> 4.9 tons/ha in 327 ha =1602 tons	<b>2.6x</b> <b>1.4x</b> <b>3.5 x</b>
<b>Koraro Ethiopia (Teff, wheat, maize, others)</b>	<b>2004</b> 0.13 tons/ha in 1067 ha = 138 tons	<b>2005</b> 0.58 tons/ha in 1979 ha =1163 tons	<b>4.5x</b> <b>1.8x</b> <b>8.4x</b>

# Staple Food Production Year 1

<b>Mayange Rwanda (Maize)</b>	<b>2005</b> 0.3 tons/ha in 80 has = 24 tons	<b>2006</b> 3.7 tons/ha in 440 ha = 1,628 tons	<b>12.3x</b> <b>5.5x</b> <b>67.8x</b>
<b>Mwandama Malawi (Maize)</b>	<b>2005</b> 0.8 tons/ha in 2175 has = 1749 tons	<b>2006</b> 5.2 tons/ha in 3841 has = 19,973 tons	<b>6.5x</b> <b>1.8x</b> <b>11.4x</b>

# **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**
- 
- **Total: 130,000**
  - **Estimate 8% still food insecure**
  - **120,000**

# Partitioning the Yield Increases

## Koraro, 2005

### Teff yields (kg/ha)

<b>2004 drought year</b>	<b>80</b>
<b>Due to good rainfall</b>	<b>+ 326 (3.4x)</b>
<b>Due to fertilizer alone</b>	<b>+179 (1.4x)</b>
<b>Due to fertilizer with improved seed + training</b>	<b>+472 (2.1x)</b>
<b>Overall (2005 improved seed + fertilizer + training) – 2004 yields</b>	<b>+798 (9.4x)</b>

# Partitioning the Yield Increases

## Mwandama Cluster, Malawi

(Maize yields tons/ha)

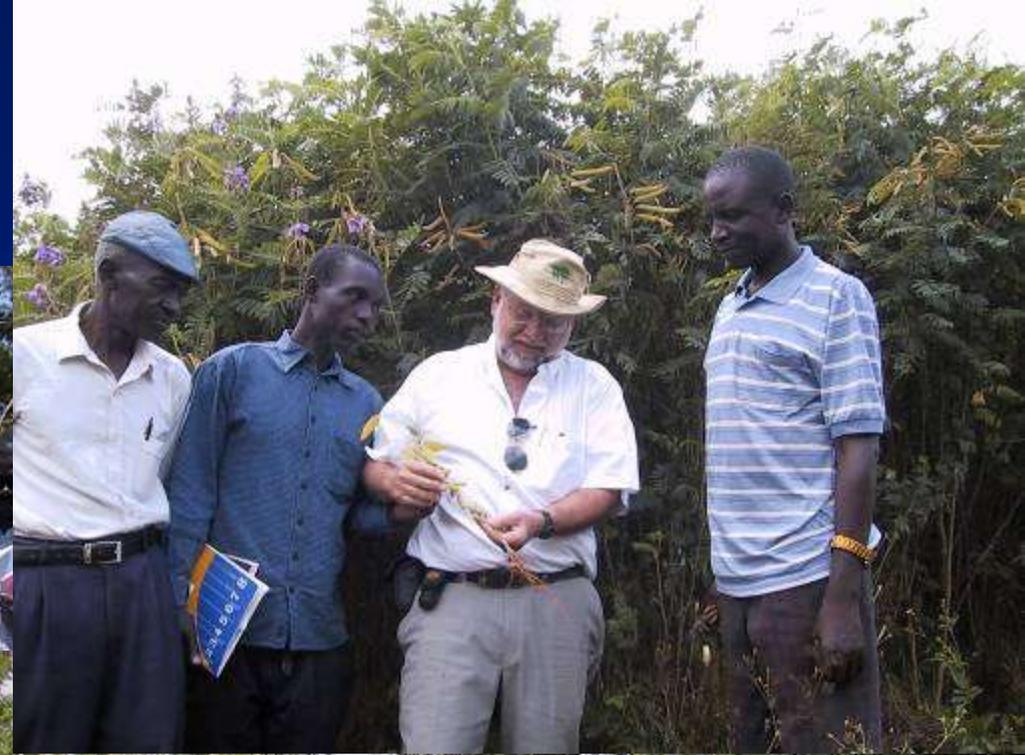
<b>2004/5 Drought year</b>	<b>0.8</b>	
<b>2005/6 Good rains, no inputs</b>	<b>2.21</b>	<b>2.8 x</b>
<b>2005/6 Good rains + fertilizer + hybrid seed + “Sasakawa” plant spacing</b>	<b>5.18</b>	<b>2.3 x</b>
<b>Overall effect</b>	<b>5.18</b>	<b>6.4 x</b>

# Cereal Banks: doubling prices



**Agrodealers**  
**Microfinance**  
**Crop insurance**

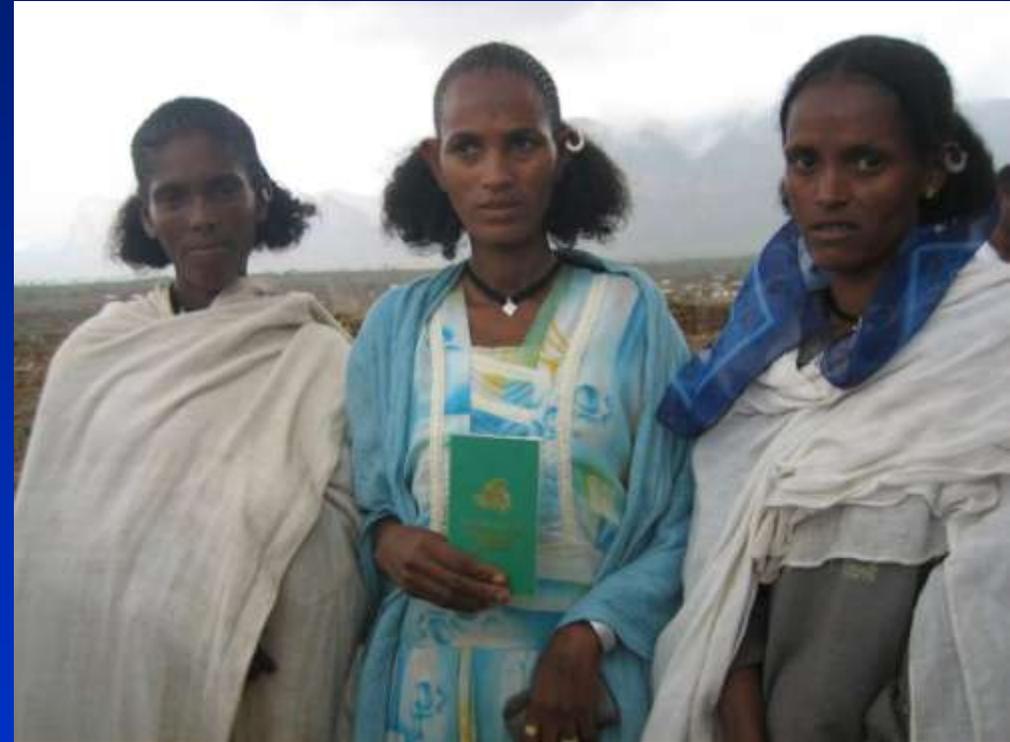
# Next Season: Agroforestry



# 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

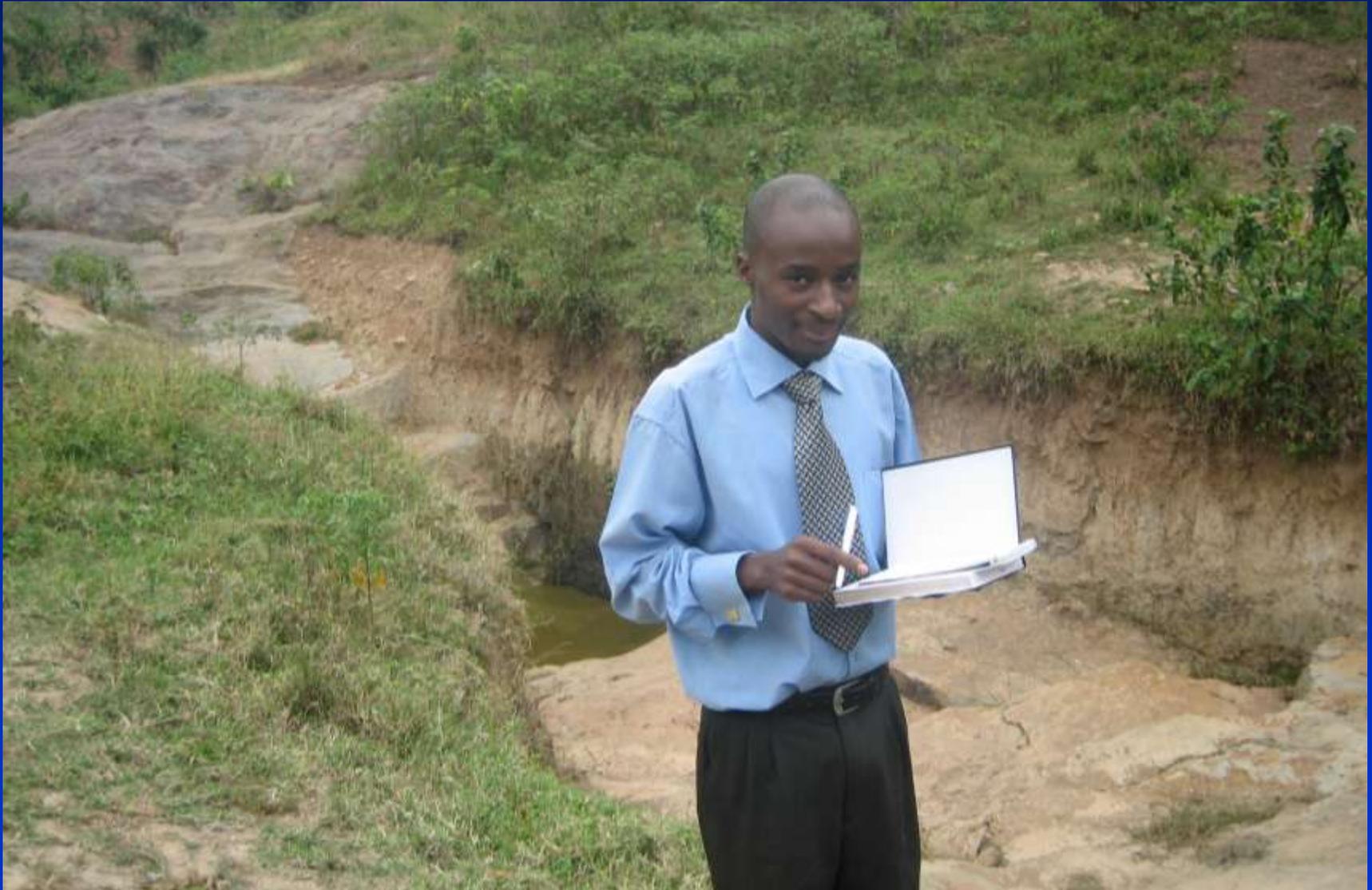


- **Balanced nutrition**
- **Suits local tastes**
- **Increases local food demand (+25% maize; pulses, livestock products, horticulture: several fold)**
- **Much more effective than food aid**

# Energy Interventions: For cooking



# Ruhiira, Uganda Cluster Source of Drinking Water



# Safe Drinking Water



# Village Truck-Koraro



# The Road!





**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



Backhaul Module  
(BH)



Subscriber Module  
(SM)



# 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**