Can we feed the world?

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Recurring food price spikes

About 1 billion people
(1 in 6 of the world’s population)
are chronically hungry

We have to increase food production by
70-100% by 2050
Recurring Food Price Spikes

(price of major crops, indices; January 1, 2007 = 100)

Sources: Bloomberg, L.P., and IMF staff calculations.
Note: 2012 data includes January-October.
Food Riots

European Photo Agency: Financial Times
Hunger

240 million in Sub Saharan Africa,

360 million in India

In both 30% of Population

In both about 400 million live on < $1.25 a day
1 in 3 children under 5 have stunted growth
180 million children

In some countries as high as 50%

Stunting linked to over 3.5 m deaths under fives

Stunting has largely irreversible long-term effects on health and development
The Challenges

Demand
- Rising populations
- Rising per capita incomes
- Growing demand for livestock products
- Growing demand for biofuels

Supply
- Impact of climate change
- Increasing water and land scarcity
- Slowing of productivity increases
- Rising fuel and fertiliser prices spikes

Contribute to hunger
The Challenges of Demand
Rise in Meat Consumption

Meat consumption rises with per capita income

World Bank, 2010. World Development Indicators

Source: FAO, 2009
Biofuel Demand is Growing Rapidly

The Challenges of Supply
More than 5% reduction in length of growing period

Average Annual Max Temp > 30°C

Source: Ericksen et al Mapping hotspots of climate change and food insecurity in the global tropics
**Russia**
- Severe heatwave in 2010
- Doubled Moscow’s death rate
- 30% of grain crops lost to burning

**Pakistan**
- Worst floods in 80 years
- Killed over 1600 people
- Submerged 1/5th of the country, including 14% of Pakistan’s cultivated land
How do we Cope?

- Political Leadership
- Food Security
- Innovation
- Markets
- People
Innovation
Mrs. Namarunda

A single mother farming a hillside in western Kenya
African Cassava Mosaic Virus (ACMV)
Mealybugs on Cassava

Source: FAO
A Secure Farm

- **Soil Fertility**
- **Resilient Crops**
- **Survival line**
- **Weeds**
- **Insects & diseases**
- **Drought**

**Months**
- 1
- 2
- 3
- 4

**Potential harvest (t/ha)**
- 1
- 2
- 3

**Actual harvest**
- >2 t/ha
Sustainable Intensification

- More with Less
- Increased yields or production
  - On the same amount of land
  - With less water
  - Less fertilisers
  - Less pesticides
  - Lower emissions of Greenhouse Gases
- While increasing natural capital and flow of environmental services
- And in a manner that is resilient

- Greater productivity but smaller footprint
Any Technology can be Appropriate

- Traditional
- Intermediate
- Conventional
- New Platform Technologies
Precision Farming
Microdosing in Niger
Precision Farming
Controlling Striga
Use ecological principles to design agricultural practices

- e.g.
  - Agroforestry
  - Integrated Pest Management
  - Organic farming
Home Gardens

Java

Ethiopian Resettlement
Conservation Farming in Zambia
Plants more nutritious
- carbohydrate and protein
- micronutrients (Vit A, iron, zinc)

Plants more resilient to
- pests and diseases
- climate change

Plants more efficient at
- converting sunlight to food
- taking up nitrogen from the atmosphere using water
The New Rices for Africa (NERICAs)

Monty Jones
Nutritive Foods

Orange-Fleshed Sweet Potato

Golden Rice

Golden Bananas
Bananas Resistant to Wilt in Uganda

- $500 million losses a year in Uganda
- Academia Sinica provided sweet potato gene
- Successfully transferred to bananas
- In Ugandan field trials
- Entirely government funded
Chaperone Genes for Drought Tolerance

- Genes from Bacterial RNA that help to repair misfolded proteins resulting from stress
- Plants rapidly recover
- No yield penalty when stress free
- In African field trials
Win-win-wins

Reduce Greenhouse Gases

Increase food security

Conserve natural resources

Win-win-wins
Socio-Economic Intensification Markets
Output Markets

- Farmer Associations
- Cooperatives
- Cereal Banks
- Contract Farms
- Outgrowers
Northern Ghana

Savanna Agricultural Research Institute
An Enabling Environment

Rural Economy

Connectivity

Farm Household in the local community

Regional trade

Local trader

National trade

Seed Co

Fertiliser Co

Agrodealer

Banks for microcredit

Model of Alliance for a Green Revolution for Africa (AGRA)
People
Most farms are Smallholdings - under 2 ha

- Globally
  - 400 – 500 million smallholders
  - 2 billion people
- In Africa
  - 33 million in Africa
  - 80% of farms in Africa
Women and Nutrition

Women as:

- Farmers
- Mothers
- Innovators
- Educators

Wambi Michael. Agfax
Agriculture develops

Greater yields

Greater trade opportunities

Farmers more prosperous

More roads and markets

More rural employment

More wage labour

Rural economy grows

Less hunger

The Virtuous Circle

People at the Heart
Political Leadership
Ghana

Agriculture Growth

- Average growth 2.6% per year
- Average growth -3.1% per year
- Average growth 5.1% per year

Constant $ million (2000)
(3-year moving average)
Thank You

www.canwefeedeftheworld.org

Follow us on twitter: #1billionhungry

For more info on Ag4Impact, go to:
www.ag4impact.org

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