

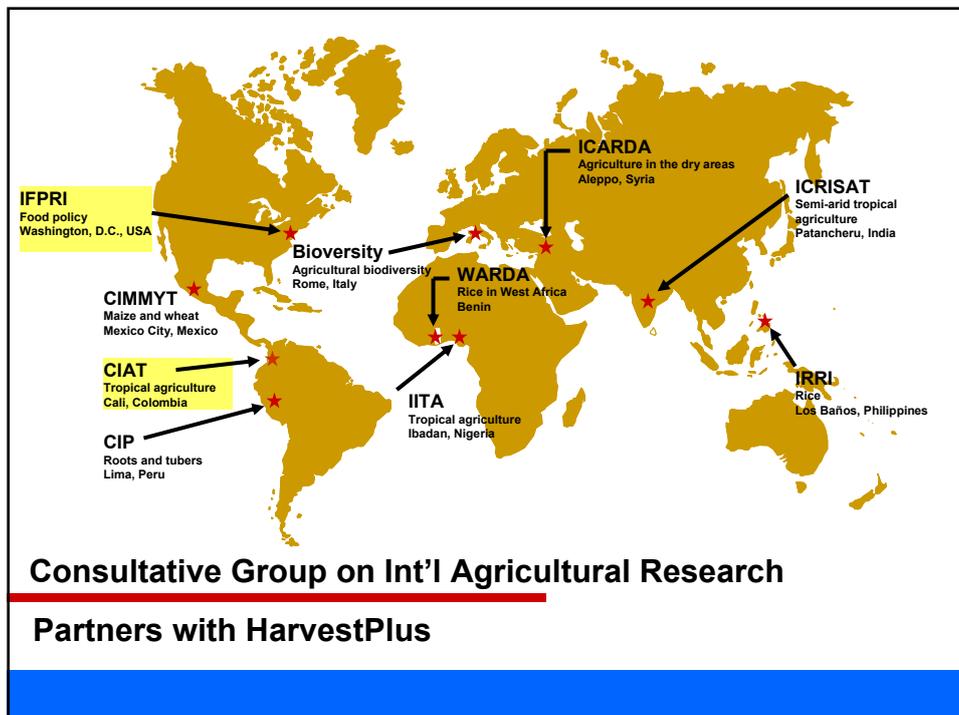
## The CGIAR

- Today I will be speaking about the **HarvestPlus Challenge Program**, one of the partnership programs supported by the CGIAR
- Outline what HarvestPlus is about
- Issues of partnerships within HarvestPlus



## The CGIAR

- The Consultative Group on International Agricultural Research (CGIAR), established in 1971, is a strategic partnership of countries, international and regional organizations and private foundations supporting the work of 15 international agricultural research Centers.



## The CGIAR

- In collaboration with national agricultural research systems, civil society and the private sector, the CGIAR fosters sustainable agricultural growth which benefits the poor through:
- Higher incomes (higher-yielding crops)
- Better food security (supplies/prices)
- Improved management of natural resources
- **Better human nutrition and health**



## Consequences of Micronutrient Malnutrition

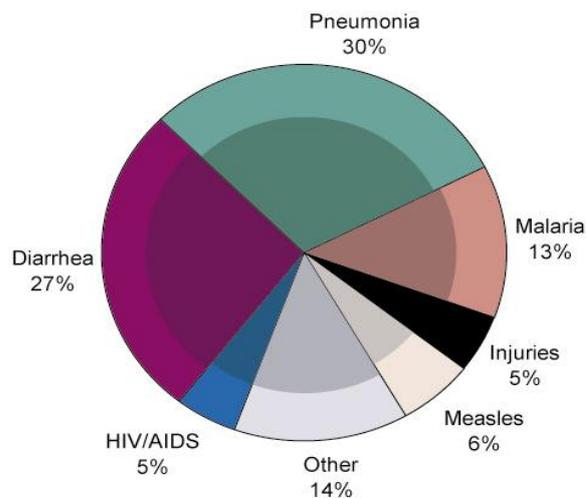
- More illness and disease
- Higher mortality
- Lower cognitive ability
- Capacity for physical labor reduced
- growth hindered- stunting
- Poorer reproductive health
- death
- Decline in productivity → lower GDP



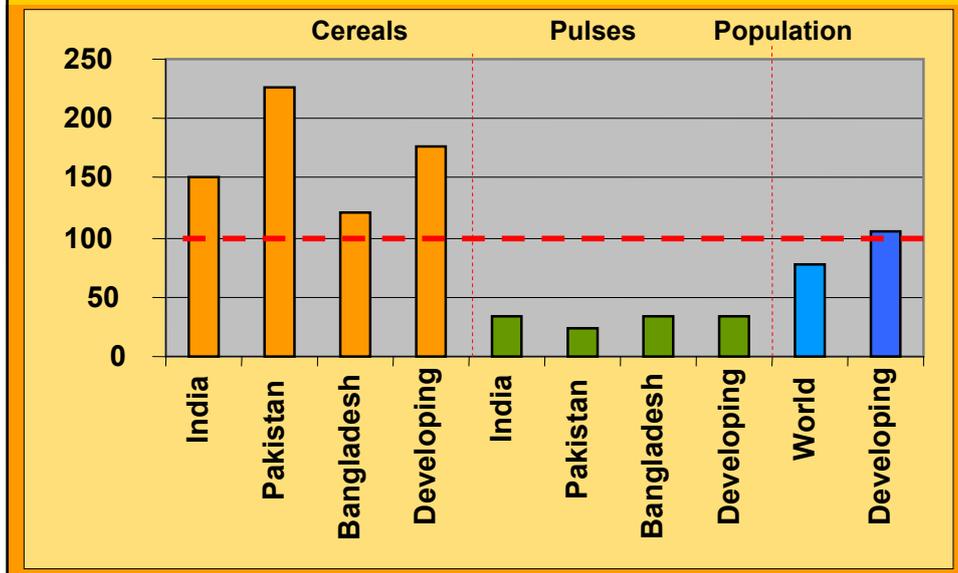
## How Important is Nutrition for Health?

Undernutrition's impact on post neonatal child deaths by illness

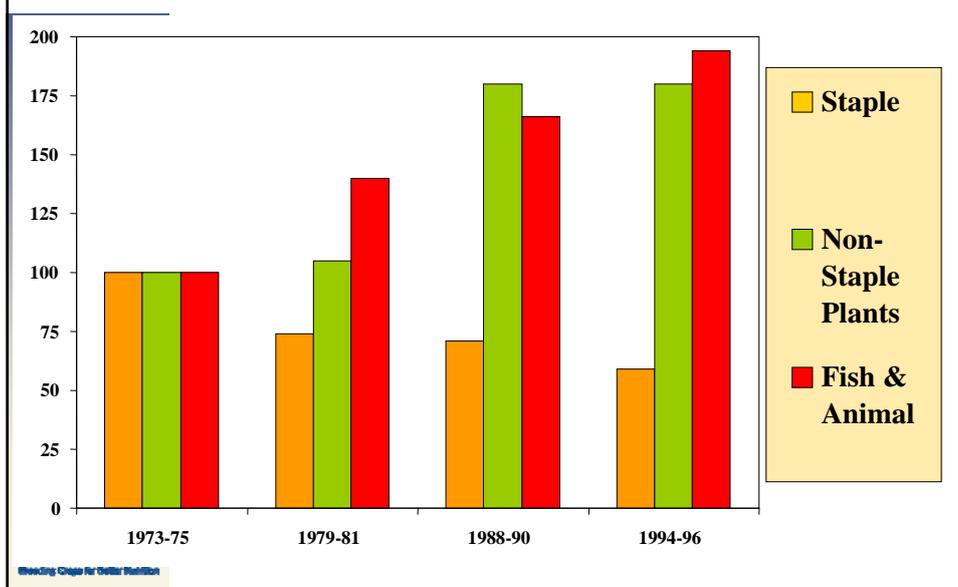
**53 % of all deaths are directly caused by undernutrition in diseased children**



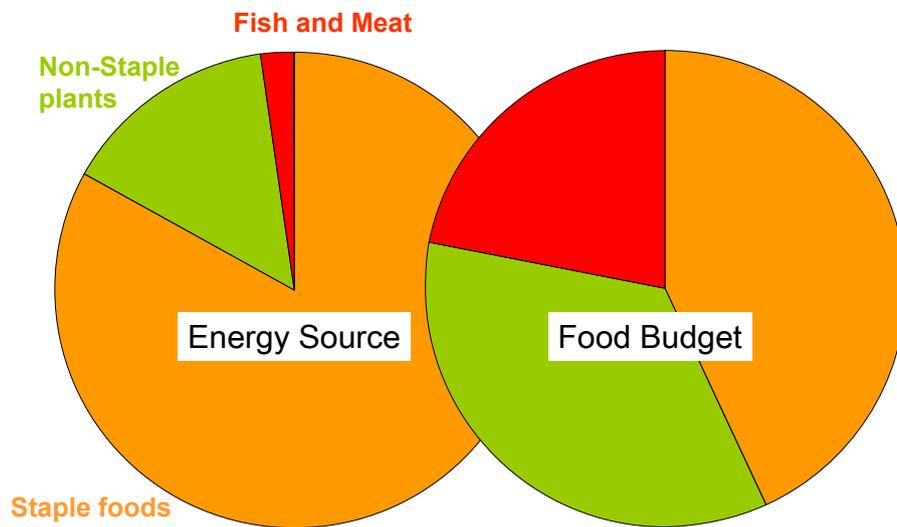
## % Changes in Cereal & Pulse Production & in Population Between 1965 & 1999



## Indices of Inflation-adjusted Prices for Bangladesh 1973-75 = 100



## Share of Energy Source & Food Budget in Rural Bangladesh



## What people eat and what it costs

Germany: \$500 / week



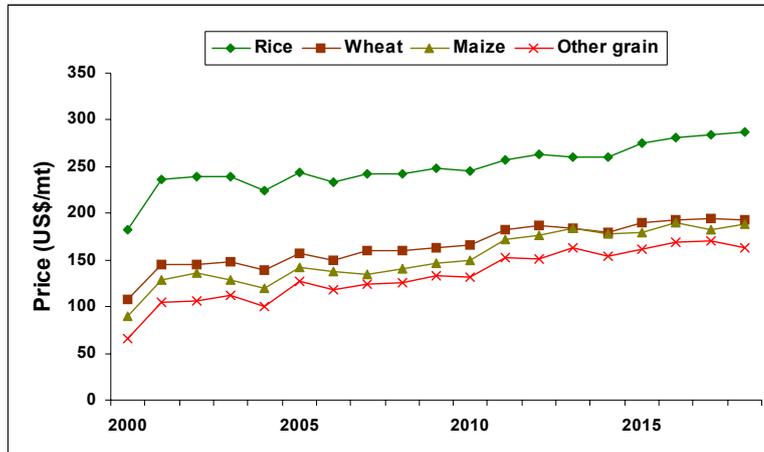
Chad refugee camp: \$1.23/week



Ecuador : \$31.55/week

Source: Hungry Planet. P. Menzel and F.D'Aluisio

## Real world cereal prices projected to rise



Source: M. Rosegrant, IFPRI 2007

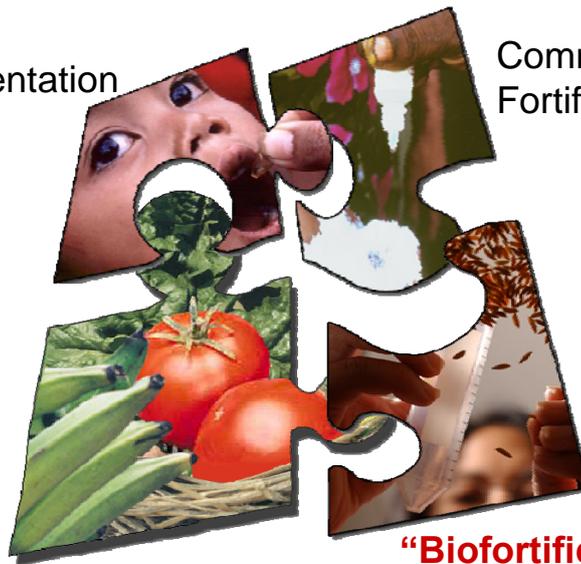


## An additional weapon to fight deficiency:

Supplementation

Commercial Fortification

Dietary Diversity



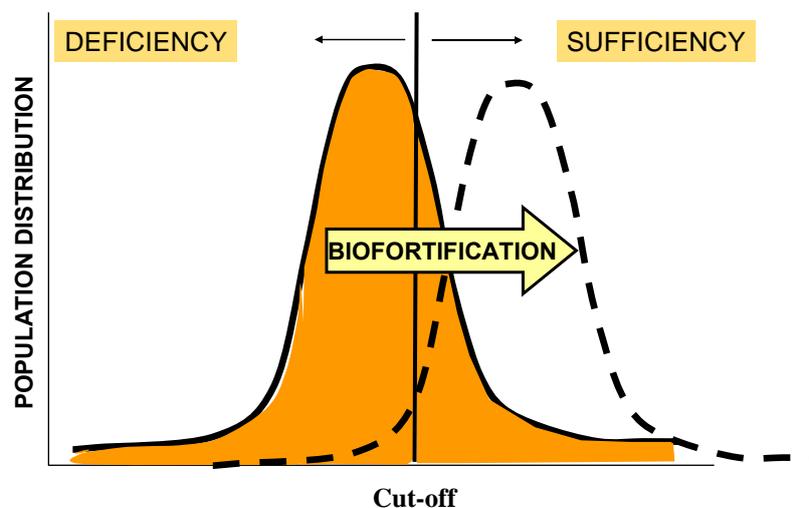
**“Biofortification”**

## HarvestPlus Biofortification Strategy

Breed micronutrient dense staple crops with higher levels of vitamin A, iron, and zinc that will improve human nutritional status when eaten.



HarvestPlus is working to move millions from deficient to sufficient



## Cost-Benefit Calculations

- Move 1% of 1 billion people across line for one year:
  - 10 million x \$20 = \$200 million
- Move 10% of 1 billion people (e.g. India) across line for ten years:
  - 100 million x \$20 x 10 year = \$20 billion



## Advantages of Biofortification

- **Targets the poor** who eat high levels of food staples
- **Rural-based:** where 75% of the malnourished populations live
- **Cost-effective:** research at a central location can be multiplied across countries and time
- **Sustainable:** investments are front-loaded, low recurrent costs



### *Phase I Crops*

- Rice
- Wheat
- Maize
- Cassava
- Sweet Potato
- Beans
- Pearl Millet

### *Phase II Crops*

- Potato
- Sorghum
- Banana/  
Plantain
- Lentils
- Groundnuts



Barley, Cowpea, Pigeon Pea, and Yams have been dropped

## PRODUCTS FOR ASIA

### Zinc Biofortified

- Rice
- Wheat

### Iron Biofortified

- Pearl Millet-India
- Lentil

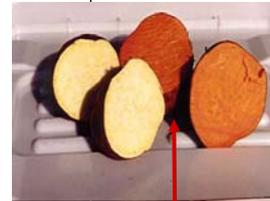
Zinc rice



## PRODUCTS FOR AFRICA

### Provitamin A Biofortified

- Sweetpotato
- Maize
- Cassava
- Banana/Plantain



Pro Vitamin A



### Iron Biofortified

- Bean
- Potato
- Sorghum



## After 4 years

- Can breeding increase nutrient levels to high enough levels?
- Will the extra nutrients be absorbed at sufficient levels to improve micronutrient status?
- Will farmers adopt and will consumers buy/eat in sufficient quantities?



## HarvestPlus Milestones By Crop Year 4 of 15

STEP	Sweet Potato	Beans	Pearl Millet	Cas-sava	Rice	Maize	Wheat
Breeding							
Bioavailability							
Dissemination							

## Schedule of Product Releases

Crop	Nutrients	Release Year of Initial Lines*
Sweetpotato	Pro-vitamin A	2007
Bean	Iron, Zinc	2010
Pearl Millet	Iron, Zinc	2011
Cassava	Pro-vitamin A	2012
Rice	Zinc, Iron	2012
Maize	Pro-vitamin A, Zinc, Iron	2013
Wheat	Zinc, Iron	2013

\* Approved for release by national governments after 2-3 years of testing

## Institutional and Coordination Issues

### Partners

- Scientists
- Implementing Agencies
- Donors
  - Those Responsible for Ensuring Accountability



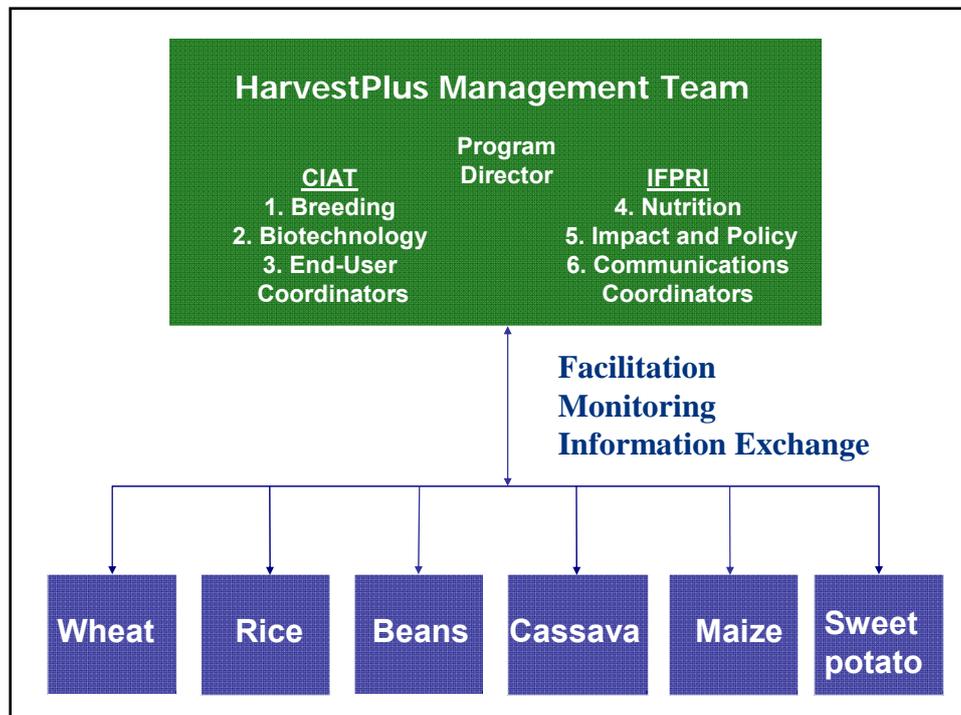
**Is the major impediment  
to the success of  
HarvestPlus:**

- 1. Scientific discovery**
- 2. Getting people  
on the same page and  
working together  
(institutional structures)**



## A Global Interdisciplinary Effort

- Plant Breeders
- Molecular Biologists
- Food Technologists
- Human Nutritionists
- Experts in Food Product Development & Marketing
- Communicators
- Economists



## HarvestPlus: Coordinating a Multidisciplinary Program

Function	Rice IRRI	Maize CIMMYT	Wheat CIMMYT	Cassava CIAT	Sweet potato CIP	Bean CIAT
1. Breeding						
2. Biotechnology						
3. Food processing						
4. Human nutrition						
5. Reaching end-users						
6. Impact/policy						
7. Communication						

## Institutions For Sweetpotato

<b>Plant Breeding</b>	CIP (Peru, Kenya, Mozambique, India), NARES in Uganda, Kenya, India, Indonesia, Philippines, Brazil, China
<b>Molecular Biology</b>	
<b>Food Processing</b>	Campinas University, EMBRAPA (Brazil); Food and Nutrition Center (Tanzania); Medical Research Council (South Africa); CIP (Peru)
<b>Human Nutrition</b>	Medical Research Council (South Africa); UC Davis (USA); ICDDRB (Bangladesh)

## Institutions For Sweetpotato

<b>Extension/Seed Systems</b>	CIP (Kenya), ASARECA, VEDCO (Uganda), World Vision (Mozambique)
<b>Market and Product Development</b>	University of Greenwich (UK); VEDCO (Uganda); World Vision (Mozambique)
<b>Demand Creation</b>	IFPRI (USA), Makerere University (Uganda); Helen Keller International (Mozambique)
<b>Measuring Impact</b>	IFPRI (USA), CIP(Kenya), Makerere University (Uganda), World Vision (Mozambique)

## Cohesion Among Crop Teams

- Sharing a **common vision** is very important to motivate “unselfish” behavior
- Opportunities for **learning across disciplines** is important
  - Example: Crop targets may change as new research becomes available
- **Constraints**
  - Different institutions, different disciplines
  - Need to publish in a narrow field
  - Need to keep institutional directors happy



## Cohesion Among Crop Teams

### Regular Communication is vitally important

- Crop meetings (18-month intervals)
  - Maize, Zambia, March
  - Wheat, Turkey, June
  - Sweetpotato, South Africa, October
  - Rice, Thailand, November
- Intranet platform (Harvestplus “Hub”) – Documents, discussions
- Weekly, sometimes daily contact by e-mail



## Sustainability – HarvestPlus Country Programs

### Coordinated Multi-Crop Activities

- **India** – government budgetary support (\$15 million over five years)
- **China** – willingness to move quickly, strong scientific infrastructure
- **Brazil** – EMBRAPA (federal) is well-funded, as well as State agricultural research institutes



## Funding (\\$million for 2003-2008)

Gates Foundation	\$38.7
World Bank	\$13.5
USAID	\$6.9
DFID	\$3.7
DANIDA & SIDA	\$1.9
Asian Development Bank	\$0.5
Interest	\$1.2
<b>TOTAL</b>	<b>\$66.5</b>

## Donors

**Voracious demand for information on progress, accountability, and recognition**

- PAC meetings (two per year)
- Annual donor reports
- Medium Term Plan revised annually
- *Ad hoc* requests for information
- Periodic external reviews
- **Media, public recognition**



## Conclusions

- Interdisciplinary dialogue and communication gets easier over time, buy-in for a common long-term vision becomes more solid
  - Considerable investment needs to be made up front in meetings to get off to a good start
- Scientists and implementers will cooperate (some non-cooperators need to be replaced over time)



## Conclusions

- A major disadvantage of crop breeding is that it takes **15 years** from initiation of planning activities to realization of widespread adoption, especially where development of new methodologies and capacity building is involved
- Sustaining donor interest over such a long period is a major challenge



## In Conclusion ...

“Such intimately related subjects as agriculture, food, nutrition and health have become split up into innumerable rigid and self-contained little units, each in the hands of some group of specialists. The experts, as their studies become concentrated on smaller and smaller fragments, soon find themselves ... learning more and more about less and less. Everywhere knowledge increases at the expense of understanding ...”



## In Conclusion

“The remedy is to look at the whole field covered by crop production, animal husbandry, food, nutrition, and health as one related subject and then to realize the great principle that the birthright of every crop, every animal, and every human being is health.”



# *The Soil and Health, 1945*

**Sir Albert Howard,  
1873-1947**

