This presentation is part of the
Agriculture and Nutrition Global Learning and Evidence Exchange (N-GLEE)
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For additional presentations and related event materials, visit: http://spring-nutrition.org/nglee-africa
Biofortification and working with the private sector

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Country Manager
HarvestPlus Uganda
Supplementation

Commercial Fortification

Dietary Diversity

Biofortification
NUTRITIONAL NOSEDIVE

IRON

+50% GLOBAL FOOD PRICES

-30% IRON INTAKE

Then...

PHILIPPINES

ONLY 5%

If poor people in developing countries face a 50% increase in all food prices across the board and no rise in income, iron intake will fall by 30%.

If iron consumption declined by 30% in the Philippines, only 5% of Filipino women would consume adequate levels of iron.
Biofortification - breeding food crops that are more nutritious

Photo: D. Marchand
Cost-effective: one time investment in research
Targeted: poor people eat staples
Complementary:
‘Grow’ your own nutrients

Photo: IRRI
Sustainable for farmers

Photo: A.M. Ball
Biofortification: Improves Status for Those Less Deficient and Maintains Status for All

POPULATION DISTRIBUTION

Iron Deficient

Biofortification and Commercial Fortification

Supplementation

Iron Sufficient

HEMOGLOBIN

12.0
Impact Pathway

**discovery**
- Identify Target Populations and Crops
- Set Nutrient Target Levels
- Screen Germplasm and Gene Discovery

**development**
- Breed and Improve Crops
- Evaluate Crop Performance
- Evaluate Nutrient Retention in Crops and Food
- Evaluate Nutrient Absorption/Impact on Health

**dissemination**
- Promote New Varieties & Deliver products
- Promote Consumption of Micronutrient Rich Crops

**Measure Improvements in Nutritional Status of Target Populations**
#1 Can breeding increase nutrient levels enough to improve human nutrition?

Photo: Wolfgang Pfeiffer
#2 Will extra nutrients be bioavailable at sufficient levels to improve micronutrient status?
#3 Will farmers adopt crops and will consumers buy & eat enough?
Crops for Asia & Release Dates

2012
Pearl Millet
Iron (Zinc)
India

2013
Rice
Zinc
Bangladesh
India

2013
Wheat
Zinc
India
Pakistan

Crops are high-yielding and with other traits farmers want.
<table>
<thead>
<tr>
<th>Year</th>
<th>Crops</th>
<th>Vitamin A</th>
<th>Country 1</th>
<th>Country 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>Cassava</td>
<td>Vitamin A</td>
<td>Nigeria</td>
<td>DR Congo</td>
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<tr>
<td>2012</td>
<td>Beans</td>
<td>Iron (Zinc)</td>
<td>Rwanda</td>
<td>DR Congo</td>
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<tr>
<td>2012</td>
<td>Maize</td>
<td>Vitamin A</td>
<td>Zambia</td>
<td></td>
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</table>

Crops are high-yielding and with other traits farmers want.
Orange Sweet Potato (OSP) 

2007-09

24,000 Households reached

Up to 68% of project HHs adopted OSP.

Up to 47% increase in share of OSP in total sweet potato area.

Up to a 100% increase in vitamin A intakes for infants, children and women from increased OSP consumption.

Orange Sweet Potato

Vitamin A

Mozambique

Uganda
One “ice-cream scoop” of orange sweet potato daily can maintain liver stocks of vitamin A in a young child.
Crop Development (Breeding): Public & Private

Vit A / Zn / Fe
Seed Production

Commercialization:
Seed companies, tissue culture & Community Multipliers
Biofortified Crops

Test Ingredients for Use in Processed Foods

Develop New Foods Products

Private Sector - Products
Products: *Pão de Ouro* (Golden Bread)

Doubling profits by substituting 38% of wheat flour (by weight) with boiled and mashed orange sweet potato
Private Sector takes the lead ...

Gari (cassava)

Orange maize flour & samp

Pearl Millet products

Courtesy: Dr. Sehgal