



The Challenge for Agriculture: Improving the Consumption of Nutritious & Safe Food for Healthier Diets in Developing Countries

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June 4, 2018 | AIARD | DC

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**RESEARCH
PROGRAM ON**
Agriculture for
Nutrition
and Health



An **Opportunity** for Agriculture: Improving the Consumption of Nutritious Food for Healthier Diets in Developing Countries

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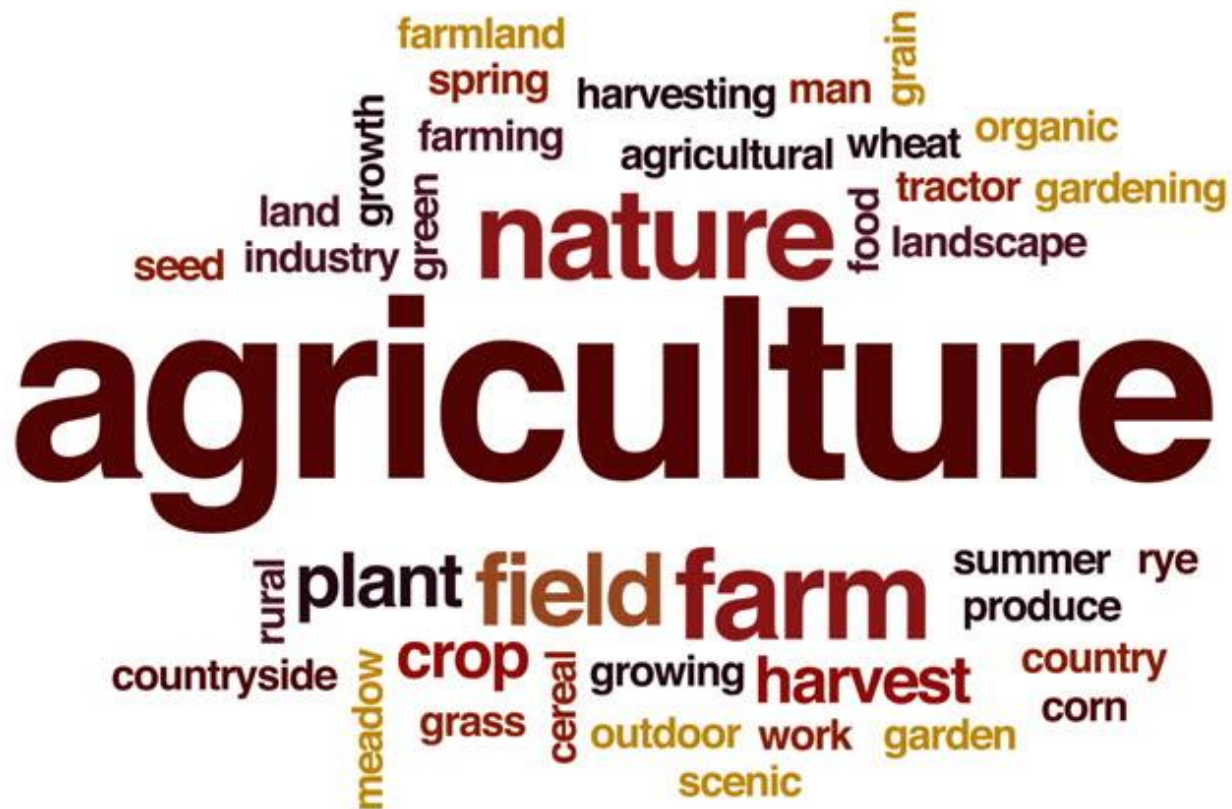
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What is agriculture?





What is happening to agriculture?

- Food supply has increased since Green revolution → Energy deficits have fallen
- Staple food prices have fallen relative to nutritious foods → Diets are of low quality
- A dozen plant and a handful of animal species provide 75% of food → Diets are less diverse
- Climate change → High CO₂ levels reducing nutrient content of staples
- 2.5 billion people are at RISK of micronutrient deficiencies → vitamin A, iron and zinc

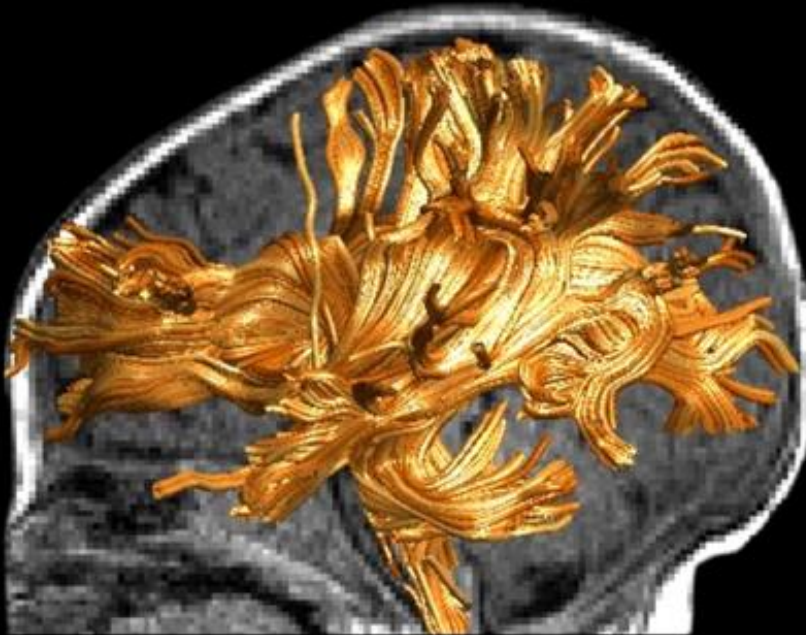


Micronutrient Malnutrition

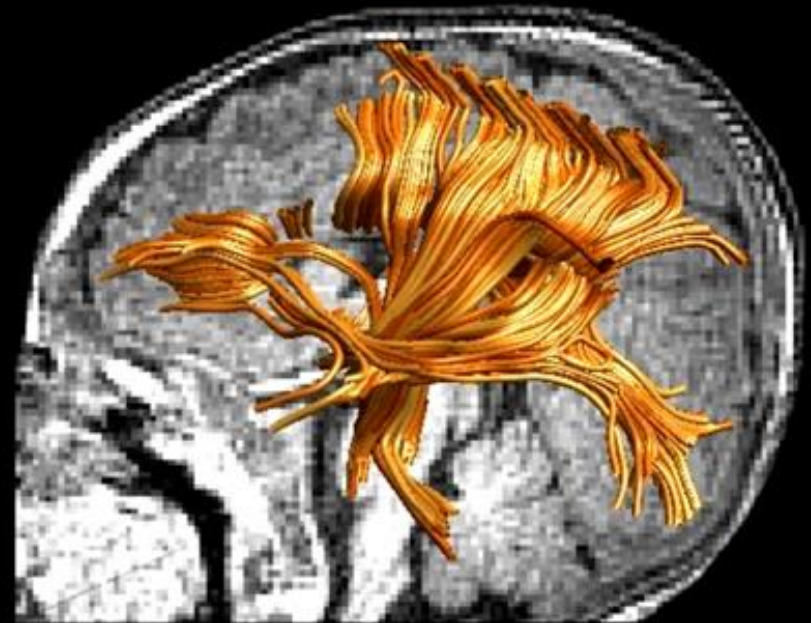
- “Hidden” hunger affecting 1 in 3 people
- Reduces adult health and productivity
- Inhibits children from reaching their full growth and development potential



A vicious cycle of poverty



**HEALTHY WELL
NOURISHED CHILD**



**MALNOURISHED CHILD
WITH STUNTED BRAIN**



Strategies for tackling hidden hunger

- **Dietary diversity**
- Supplementation
- Fortification
- **Biofortification**





Biofortification



Biofortification is a process of **increasing the density** of vitamins and minerals in a crop through **plant breeding** or **agronomic practices**, so that the biofortified crops, when consumed regularly, will generate measurable improvement in vitamin and mineral nutritional status.



Does biofortification work?

*Can conventional breeding add extra **nutrients** in the crops without reducing **yields**?*

*When consumed, can the increase make a **significant impact** on human **nutrition**?*

*Are **farmers** willing to grow biofortified crops?*

*Are **consumers** willing to eat biofortified foods?*

*Is biofortification **cost-effective, sustainable and scalable**?*



Almost 300 varieties released



BIOFORTIFIED CROPS: WHAT IS AVAILABLE WHERE?



Biofortified crops are conventionally bred to have higher levels of essential vitamins and minerals that are needed for good health.



Updated May 2016. Source: HarvestPlus. Copyright © 2016 HarvestPlus. Further information: www.harvestplus.org
 HarvestPlus improves nutrition and public health by developing and generating biofortified food crops that are rich in vitamins and minerals needed for good health, and providing global leadership on biofortification evidence and technology. HarvestPlus is part of the CGIAR Research Program on Agriculture for Nutrition and Health (A-4NH). CGIAR is a global agriculture research partnership for a food secure future. Its science is carried out by its 15 research centers in collaboration with hundreds of partner organizations. The HarvestPlus program is coordinated by two of these centers, the International Center for Tropical Agriculture (CIAT) and the International Food Policy Research Institute (IFPRI). HarvestPlus principal donors are the UK Government, the Bill & Melinda Gates Foundation, the U.S. Government's Feed the Future initiative, the European Commission, the Government of Canada and donors to A-4NH. HarvestPlus is also supported by the John D. and Catherine T. MacArthur Foundation. Data source: HarvestPlus and International Potato Center (CIP)



Cassava

Vitamin A

Provides up to 40% of daily vitamin A needs



Beans

Iron

Provides up to 50% of iron needs



Maize

Vitamin A

Provides up to 25% of daily vitamin A needs



Pearl Millet

Iron

Provides up to 80% of iron needs



Sweet Potato

Vitamin A

Provides up to 100% of daily vitamin A needs



Rice

Zinc

Provides up to 60% of zinc needs



Wheat

Zinc

Provides up to 50% of zinc needs



Biofortified crops are efficacious

- In all biofortified crops micronutrients are bioavailable
- **Vitamin A** biofortified crops reduce vitamin A deficiency & diarrhea, improve vision
- **Iron** biofortified crops reverse iron deficiency and improve cognitive & physical functions
- **Zinc** biofortified crops can improve immune function, reduce inflammation, pneumonia, vomiting and fever



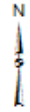


Farmers like biofortified crops

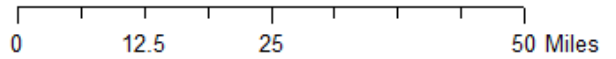
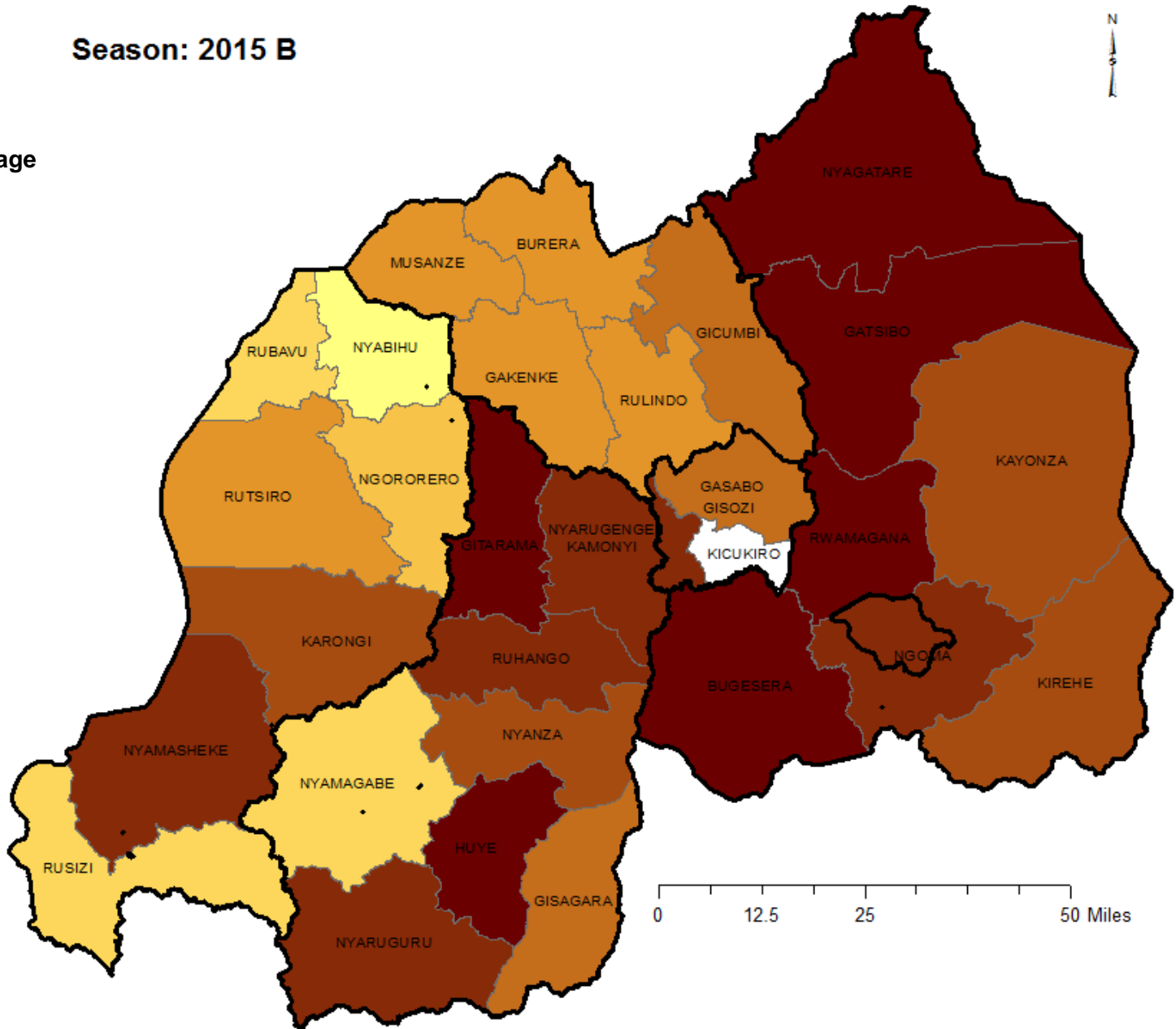
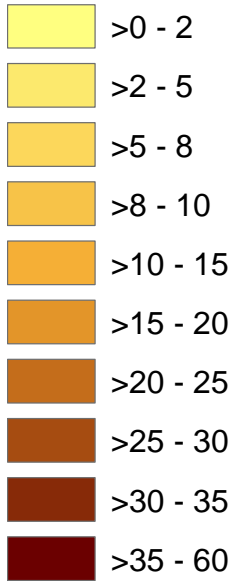


- Varieties are developed **with** farmers
- As of the end of 2017, 6.7 M farm households (33 million people) **are growing & consuming** biofortified crops
- Evidence shows increasing adoption & diffusion of biofortified crops

Season: 2015 B



Districts: Percentage of Adoption





Consumers like biofortified foods

- Consumers like biofortified foods
- Color change is not an impediment
- Significant role of nutrition information
- Potential to link to urban markets





Biofortification is cost-effective

- Return on investment 1:17
- Cost-effectiveness \$15-20 for DALY saved



Scaling up biofortification

- Aim to reach 1 billion by 2030
- Need to work **ACROSS** the supply chain
 - Supply **PUSH**
 - International and national breeding programs
 - National governments and multilateral institutions
 - Demand **PULL**
 - Private food companies process
 - Consumers demand nutritious foods



Thank you!



*Let food be
thy medicine
and medicine
be thy food.*

-HIPPOCRATES