



FEED THE FUTURE

The U.S. Government's Global Hunger & Food Security Initiative

This presentation is part of the

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Strengthening Partnerships, Results
and Innovations in Nutrition Globally



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Addressing micronutrient deficiencies through stronger public/private partnerships



WHAT ARE “MICRONUTRIENTS”?

- Two types of nutrients: macro and micro
 - Macro: fat, protein and carbohydrate (and water)
 - Micro: vitamins and minerals
- For public health purposes, “micronutrients” usually refers to vitamin A, iron, iodine and zinc because:
 - Deficiency is common
 - Deficiency consequences are severe
 - Feasible public health control measures exist

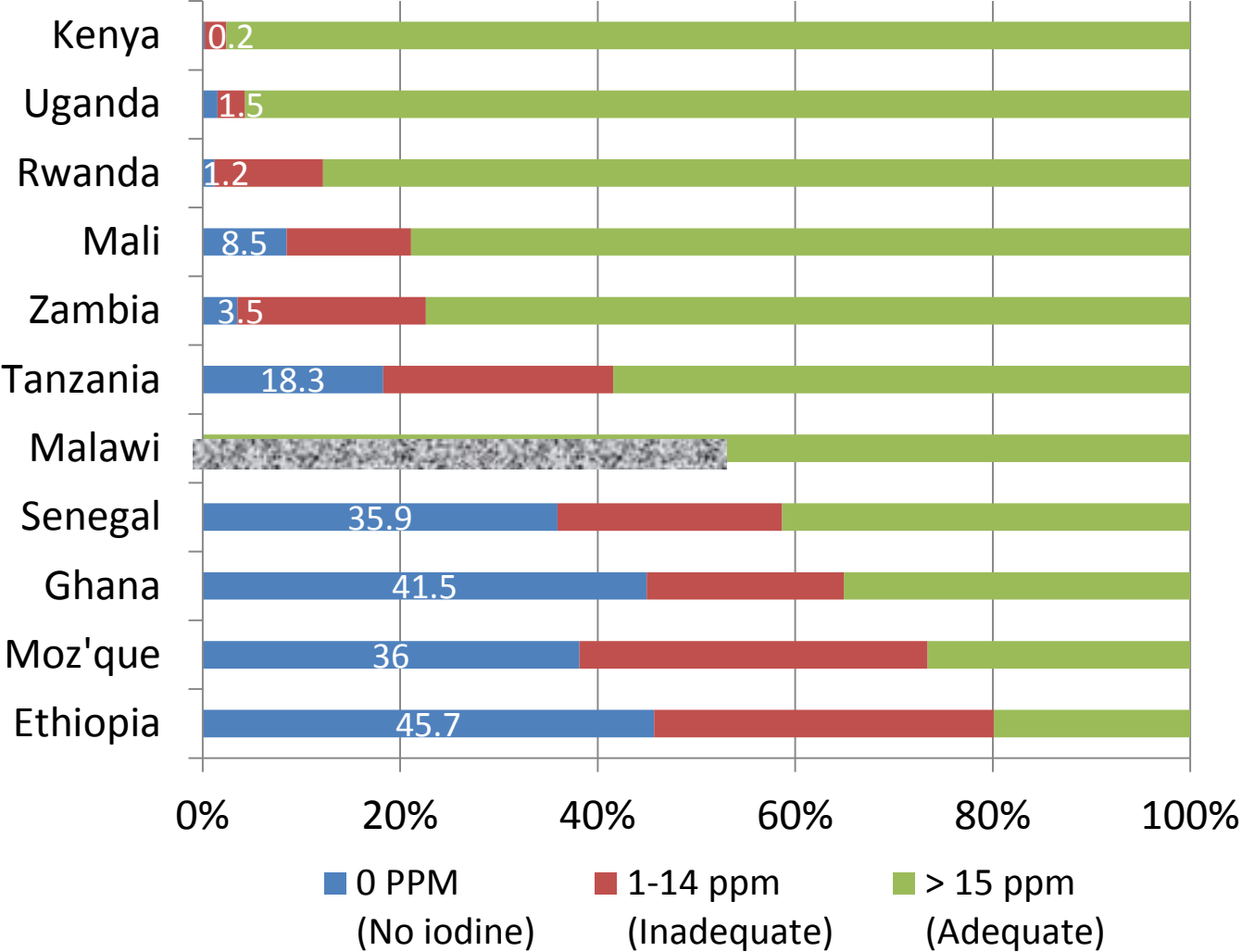
CONSEQUENCES OF MNM

- Micronutrient malnutrition has many adverse effects on human health, not all of which are clinically evident (“hidden hunger”)
- Even moderate levels of deficiency can have serious detrimental effects on human function
- Profound implications for economic development & productivity

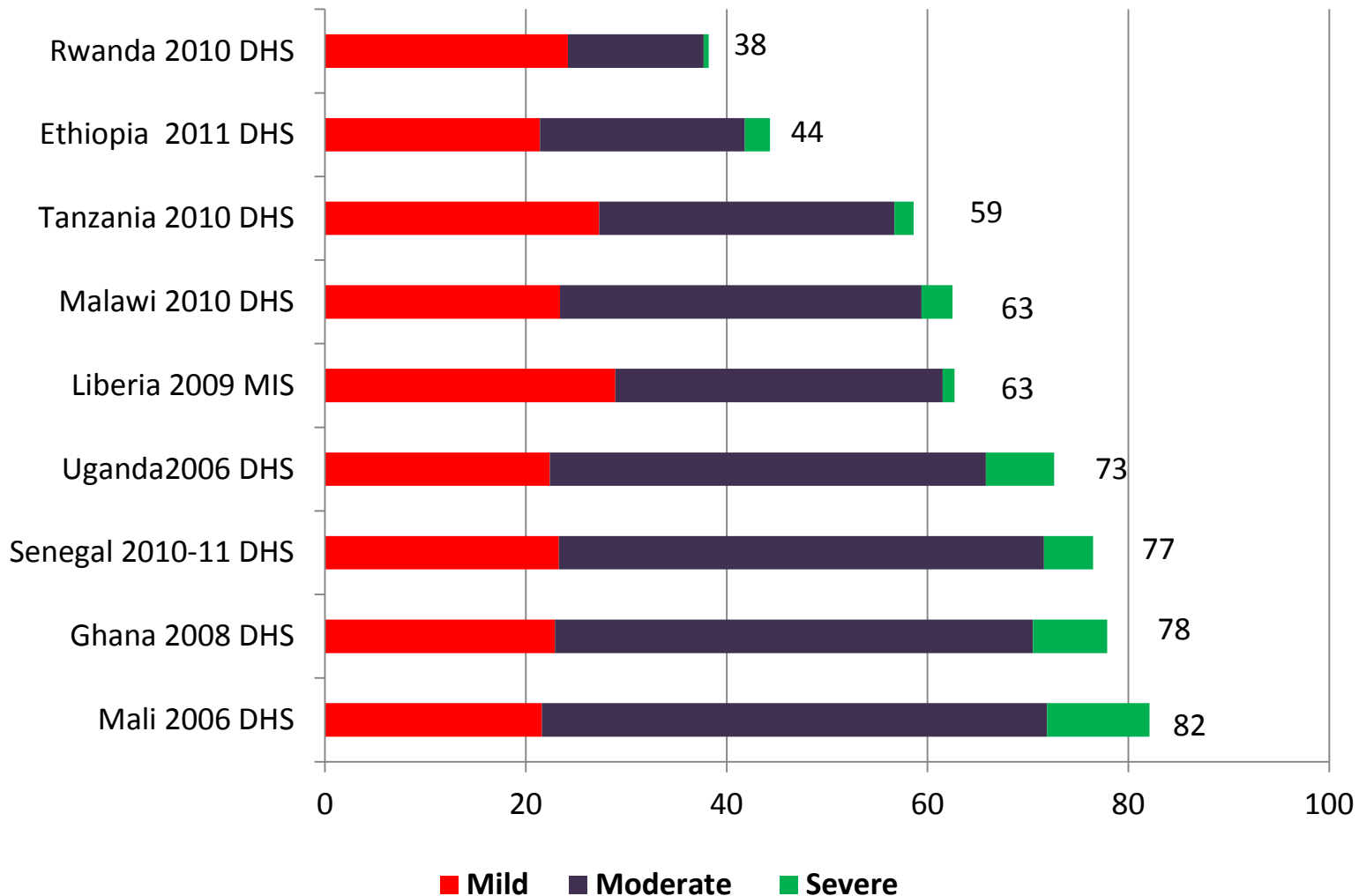


Severity of the Problem in Feed the Future Countries

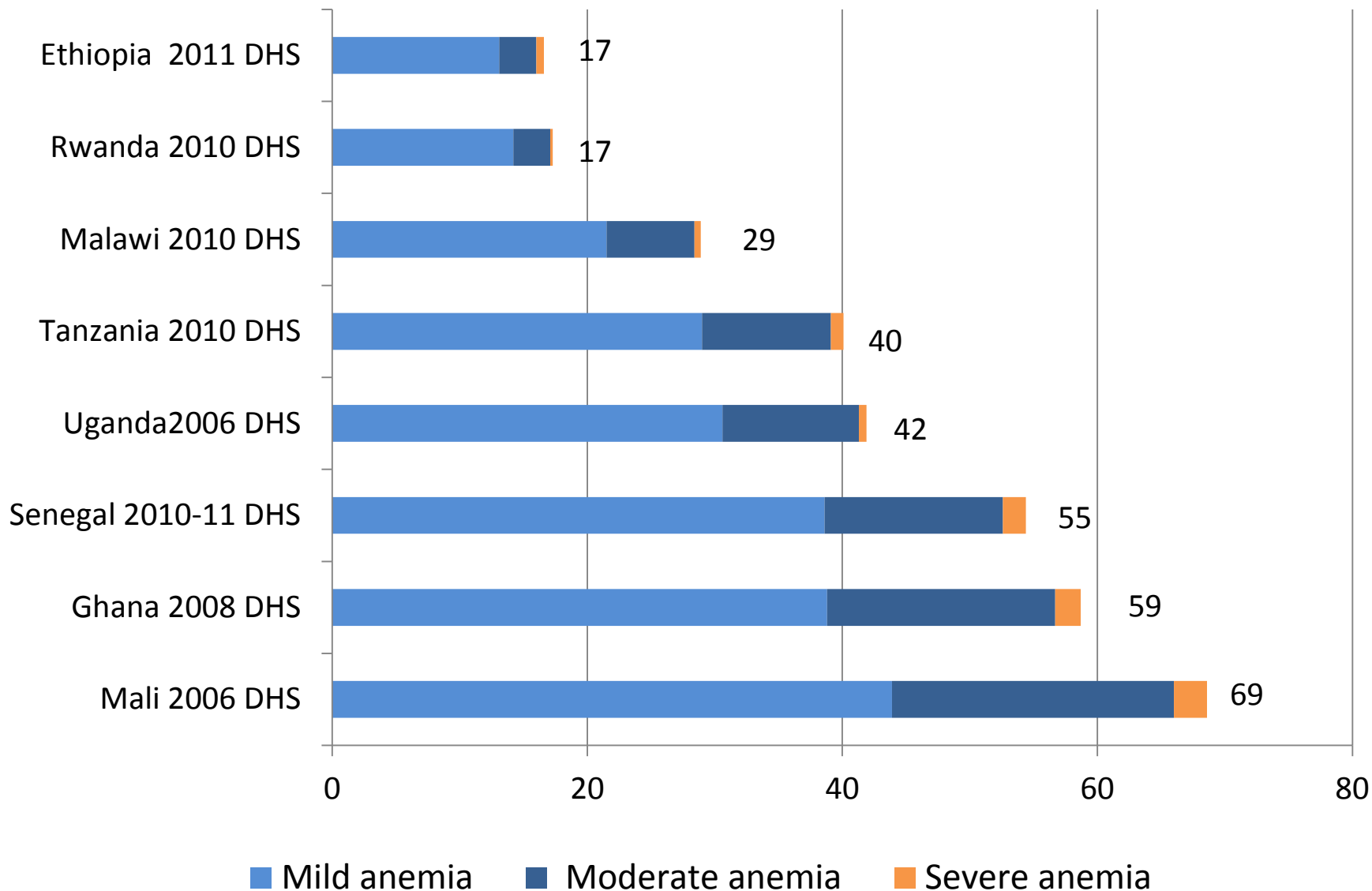
Proportion Of Households Consuming Iodized Salt (%)



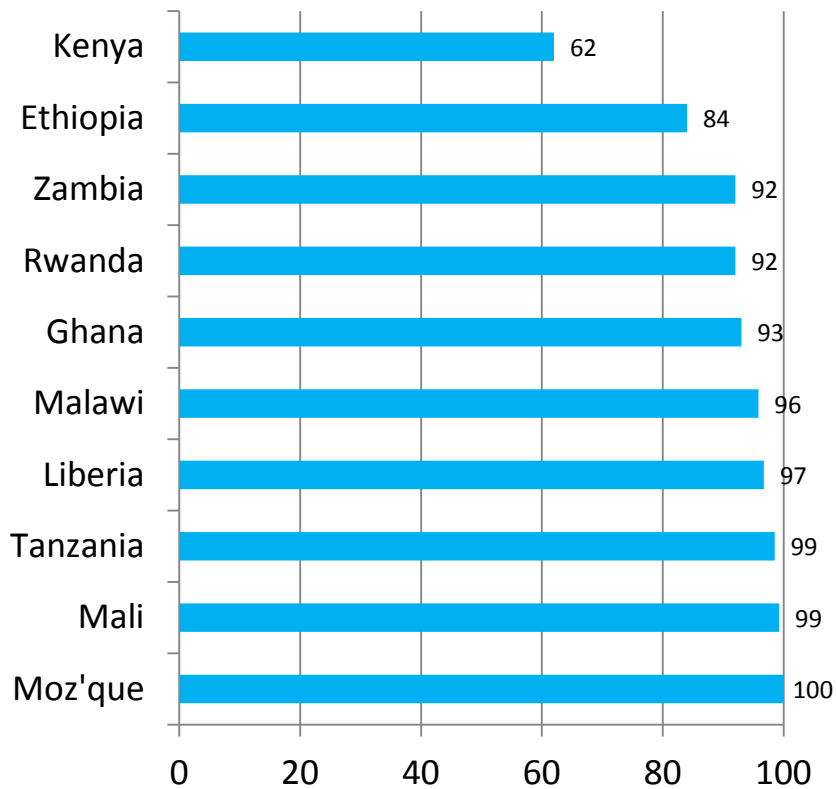
Prevalence of Anemia in Children U5



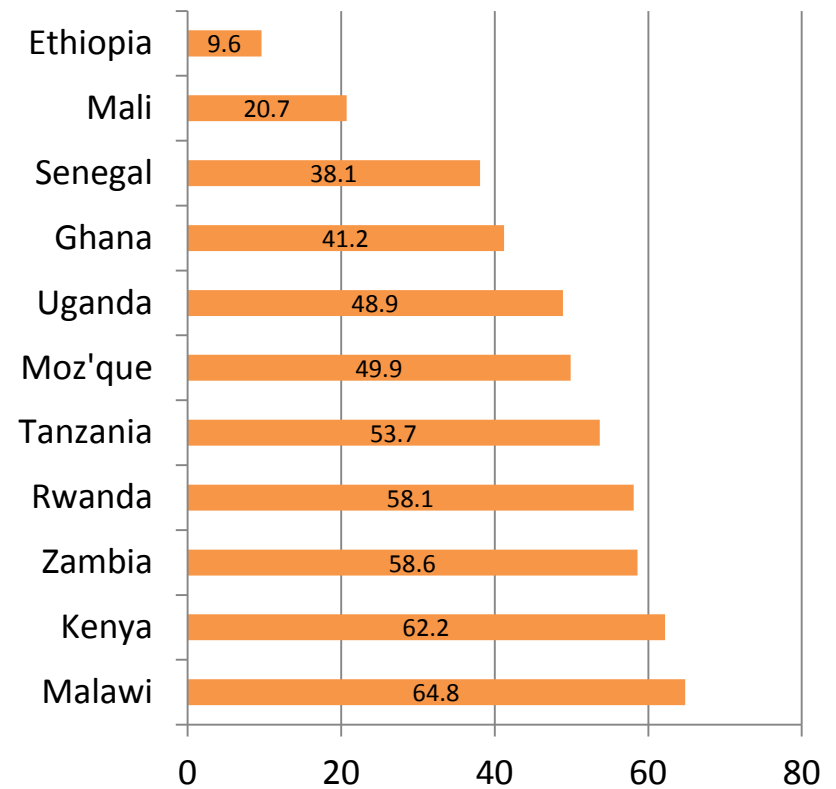
Prevalence of Anemia in Women (15 – 49 Yrs)



% Children Receiving Full Vit. A. Suppl (2 doses)



% Children U3 Living with their Mother who Consumed Vit. Rich Fruits & Veg in Preceding 7 Days



Consequences of Micronutrient Deficiencies

Consequence	Iron	Vitamin A	Iodine	Zinc
Maternal mortality, miscarriage and neonatal mortality	✓		✓	
Low birth weight	✓		✓	
Impaired cognitive development and decreased intellectual capacity	✓		✓	
Impaired immunity	✓	✓		✓
Disability, especially blindness		✓		
Severe mental retardation			✓	
Stunted growth	(✓)		✓	✓
Compromised life expectancy	✓	✓	✓	✓
Reduced work output	✓		✓	

Impact on Economic Development

- Lost potential
 - Adult work productivity
 - Cognitive functioning
 - Social costs of mortality and morbidity
 - Failure to achieve full potential as students, parents, workers & citizens
- Iron deficiency (Ross and Horton, 2003):
 - Productivity loss: USD 2.32 per capita
 - Productivity + cognitive loss: USD 16.32 per capita (4% of GDP)

Vitamin & Mineral Deficiencies:

4 strategies for preventing/correcting deficiencies in populations (implemented alone or in combination):

1. Supplementation
2. Food fortification
3. Biofortification
4. Dietary modification or diversification

1. Supplementation

The prophylactic or therapeutic provision of nutrients in pharmaceutical form.

With adequate coverage, supplementation can dramatically and rapidly reduce micronutrient deficiency.

1. Supplementation (cont.)

Advantages

- Rapid impact
- Therapeutic effectiveness
- Targeting of specific populations

Disadvantages

- Adherence requirements (behaviors)
- Delivery program costs
- Logistical complexity (forecasting, procurement, etc.)

2. Food Fortification

- *The practice of deliberately increasing content of an essential micronutrient in a food to improve its nutritional quality*
- The amount of nutrient added generally is very small, less than RDA.
- Though impact is not as rapid as supplementation, fortification can economically and sustainably reduce micronutrient deficiency.

2. Food Fortification

Advantages

- If fortify staple food, no changes required in dietary habits
- Very low cost per person
- Costs passed to the consumer (usually negligible)

Disadvantages

- Limited by scope of market for centrally processed foods
- To be most effective, requires food vehicle with relatively small variation in consumption
- Therapeutically less effective than supplementation
- Quality control difficult at small scale due to small amounts of nutrients added

2. Food Fortification continued

Variants of Food Fortification Programs:

- **Targeted Food Fortification:** designed for specific populations e.g. as complementary foods
- **Mass Fortification:** addition of micronutrients to foods consumed by the general public
- **Community-based milling and fortification** (small-scale)
- **Market Driven Fortification** – Food manufacturers driven
- **Point-of-use fortification** e.g. MNPs

3. Dietary diversity promotion / behavior modification

Promoting consumption of a diet that provides necessary micronutrients in adequate amounts.

- Many different behaviors involved:
 - Feeding of infants and young children
 - Household food choices
 - Crop production choices
- Influenced on availability and cost

3. Dietary diversity / modification

Advantages

- Sustainable elimination of micronutrient deficiency
- Benefit from foods greater than sum of individual nutrients

Disadvantages

- Difficulty of achieving without improving incomes.
- Difficulty of changing food production patterns and markets.
- Difficulty of changing food habits.
- Adherence issues—who eats what they should even when they know what's good for them?
- Time

4. Biofortification

Use of plant breeding techniques to enhance the micronutrient content of staple foods

- ✓ A new, complementary, approach
- ✓ The target nutrients include:
 - Fe and zinc in beans, rice, and wheat
 - Orange-fleshed sweet potatoes with beta-carotene (precursor of vit. A)

4. Biofortification

Advantages

- Targets the poor (staples a large share of diet)
- Rural-based (complements fortification and supplementation)
- Cost-effective (multiply across countries)
- Sustainable (investments front-loaded)

Disadvantages

- Time (e.g., change in zinc recommendations)
- Hybrid seed in some cases
- Crop itself may limit bioavailability (phytates in beans)