Translating R4D in Food Security

(Agricultural and Nutritional Resilience)

Research for Development at the Food Processing, Training & Incubation Centre, University of Eldoret, Kenya

By

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Research for Development Conference (R4D), May 2019, Uganda

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- **Food security is a complex sustainable development issue and is linked to the 17 SDGs, linked to health through malnutrition, but also to sustainable economic development, environment, and trade.**

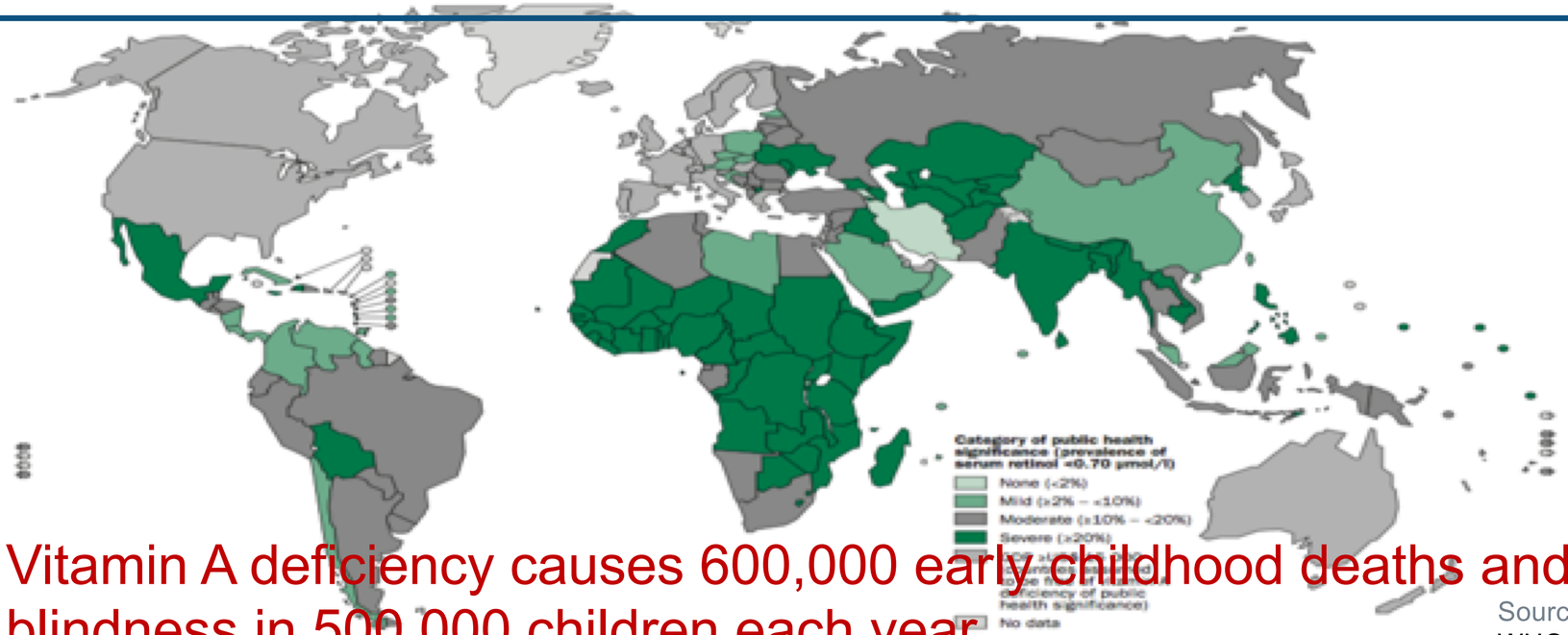
In FS-R4D, a research team endeavors to pursue as many SDGs as they possibly can, mapping out the problem using primary data.

The R4DProblem: High global prevalence of vitamin A, iron and zinc deficiency

Vitamin A Deficiency

190 million (33.3%)
Pre-school age children

19.1 million (15.3%)
Pregnant women



Vitamin A deficiency causes 600,000 early childhood deaths and blindness in 500,000 children each year

Iron Deficiency

273 000 deaths: 45% in Southeast Asia, 31% in Africa (2004 report)

Zinc Deficiency

> 450,000 deaths annually in children <5 years of age (worldwide)

Sources:
WHO Global Database, http://whqlibdoc.who.int/publications/
Harvest plus. http://www.harvestplus.org/content/zinc

R4D: Creating successful models using food and nutrition-related technologies to enable us to tackle the relevant malnutrition problem

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- **Using a Food Systems approach to curb postharvest losses.**
- **Expand cereal/veges/fruit markets in urban/rural Kenya through application of diversified food technology.**
- **Improve nutritional quality of food products.**
- **Enable a market-pull for food fortification**
- **Support entrepreneurship.**

R4D: Strategies to alleviate micronutrient deficiencies

Supplementation

Commercial Fortification

Dietary Diversification

To possibly translate to a presence in the market??

Biofortification

Means

B: Using plants within the food system as natural fortificants


Baobab Fruit


Moringa


Hibiscus


Amaranth


Mango


Oule


Pumpkin



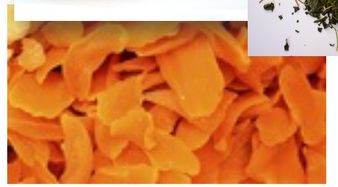
Carrot


OFSP

Plant species	Vitamin A (ug RE)	Zn (mg/g)	Fe (mg/g)
Amaranthus sp.	327	0.02-8.4	0.3-3.8
Arachis hypogea	-	-	1
Bidens pilosa	301-985	0.9-2.6	162-340
Brassica sp	-	0.9-1.3	27-31
Mangifera indica	1090.8	-	0.5
Chenopodium album	316	1.4-18.5	2.2-6.1
Cleome sp.	1200	0.6-0.8	2.6-2.9
Cucurbita pepo	194	2.3	1.5
Carica papaya	447.6	trace	0.4
Galinsoga parviflora	-	1.5	3
Ipomoea batatas (OFSP)	103-980	0.03-3.1	0.6-1
Manihot esculenta	1970	0.34	-
Daucus carota	3057.3	-	-
Senna occidentalis	-	2.1	2.5
Solanum sp	1070	-	-
Sonchus oleracea	985	0.5	2.7
Vernonia sp.	-	0.08	0.8-3.2
Vigna unguiculata	99	0.23	0.3-3

Odhav et al. 2007. J. Food Comp. Anal 430–435.
Ejoh, et al. 2007. Pakistan Journal of Nutr. 712–717.
Isong, et al., 1997. Plant Foods Hum Nutr. 79–84.

The Technology premise: Food Processing can help to reach "target" consumers and create a "value chain" (Farmer-Processor-Consumer Chains)



Consumers

Weekly market

Mini-market

City shop

Fair

Exports

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Processors

Retailers

½ Wholesalers

Urban Wholesalers

Intermediates

Processor's organization

Equipment suppliers

Rural Wholesalers

Central Selling Units

Farmers

NGO AND DEVELOPMENT PARTNERS

Inputs suppliers

Financial institutions

Farmer's organization

Courtesy of H. de Groote (2016)

Research and Product Development at scale-up.

At this stage, stakeholder engagement is necessary

Figure 2: Scaling Up Approaches and Methods of Scaling Up R&D Products at FPTIC

Type	Method
Expansion	• Growth • Restructuring • Franchising • Spin-off

R4D _ Training women/young Entrepreneurs

- Innovative food product development is continuously undertaken using a systems approach so as to produce nutritionally enhanced biofortified cereal products plant-based processed natural fortificants in order to enhance nutrition in the product thus help in curbing malnutrition among consumers.
- The purpose of the Centre is to develop a variety of cereal formulations with the aim of getting naturally fortified nutrient rich products with a market demand. All the knowledge used in training emenates from development research.

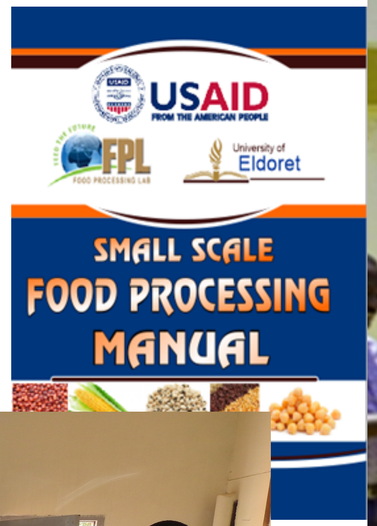
R4D-Engaging with rural smallholders-Gender and all age inclusive

Develop nutritious products using a food systems based approach,

"

"Engage-enable the community

From research4d To training



Current Products

Incubatee's brand label "Nefer wellness"

Take away messages for R4D

- **Embrace science and technology and local knowledge.**
- **Understand the "consumer" and the community and meet them where they are.**
- **Look for opportunities for changes in products to meet nutrient needs in unique ways.**
- **Train, and incubate for potential entrepreneurs for sustainable production and consumption.**
- **Foster partnerships with key entrepreneurs and global partners.**
- **Push and pull for biofortified crops to reach consumers at market.**

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The author is grateful to:

- USAID & Laser Pulse for the funds
- Home institutions for various forms of support.
- The organizers for the invitation.
- The audience for listening.

THANK YOU