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A systems approach for sustainable healthy diets: Example of increasing fruit and vegetable intake

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Nutrition, diets and health

CGIAR Fruit and Vegetables for Sustainable Healthy Diets

2.0 Billion
People are affected by micronutrient deficiencies worldwide.

2.2 Billion
People are overweight or obese (40% of all men & women).

1.2 Billion
People have increased blood pressure.

0.5 Billion
People have diabetes.

Poor quality diets is the **leading cause** of disease worldwide.

In 2017, **3.9 million deaths** were **attributed to inadequate fruit and vegetable intake.**

1 in 5

Lives could be saved each year by improving diets (including increasing intake of fruits and vegetables).

Overarching challenges

1 Availability

Insufficient year-round availability of diverse fruits and vegetables, which means high costs and hard-to-find sources.

2 Accessibility

All too often, consumers are not close enough to safe sources of fruit and vegetables for consumption to be convenient or possible on a regular basis.

3 Affordability

Low income + high costs of safe and diverse fruits and vegetables make healthy diets unaffordable.

4 Desirability

Even when fruits and vegetables are available, accessible and affordable, people often do not eat sufficient quantities. This is due to the complex interplay of a person's cognition, environment and behavior.

Fruit and vegetable supply in FRESH Countries[1]

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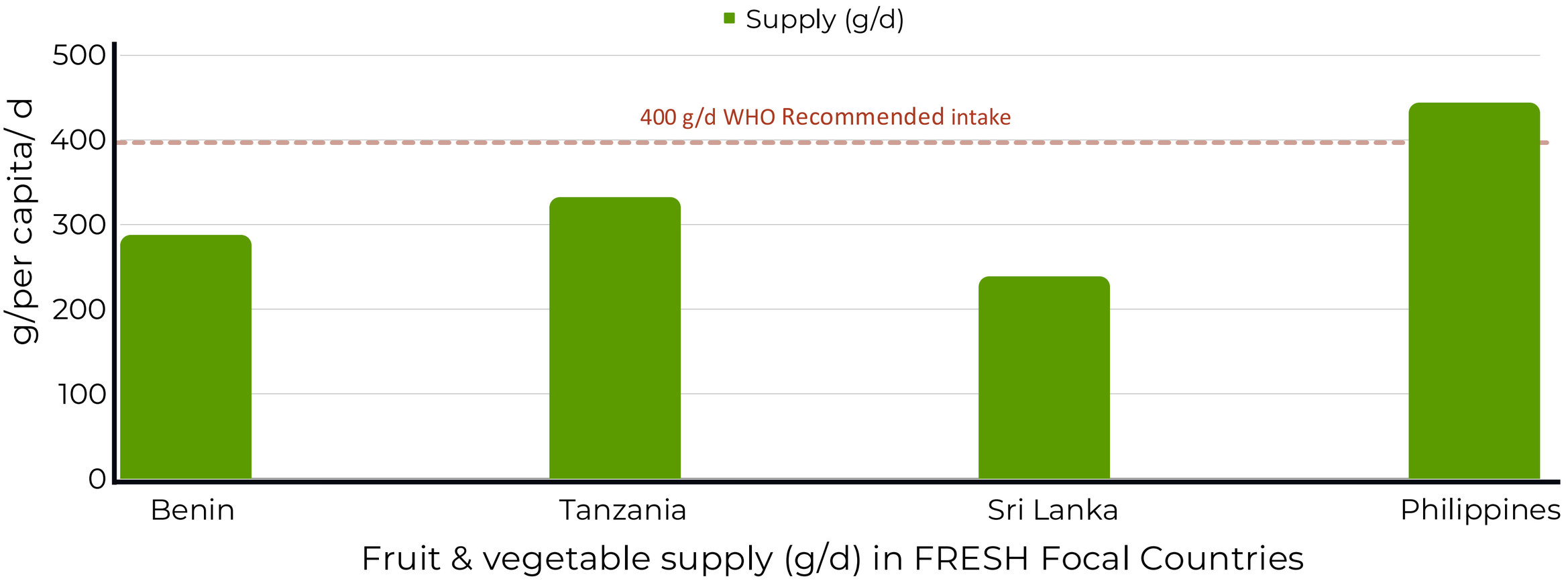

[1]Food Systems Dashboard, 2017

Fruit and vegetable supply and consumption gaps in FRESH Countries[1]

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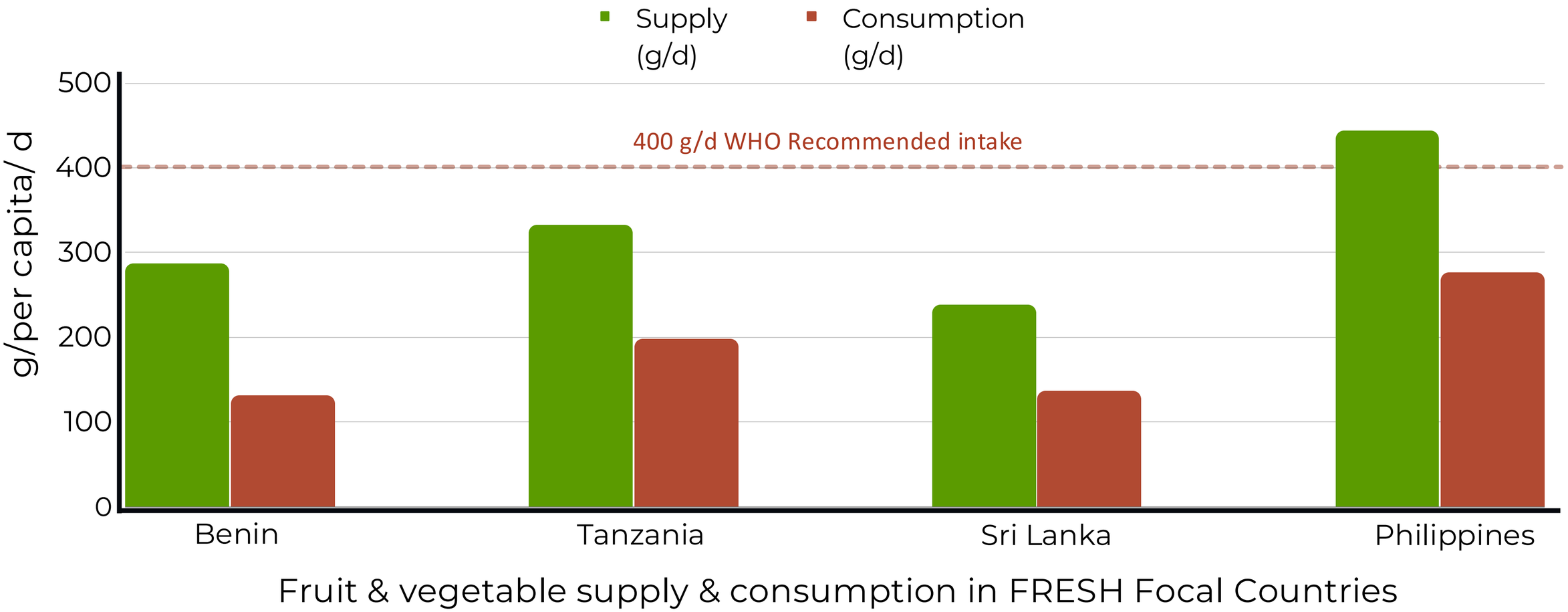

Fruit & vegetable supply & consumption in FRESH Focal Countries

[1]Food Systems Dashboard, 2017

Affordability of diets globally

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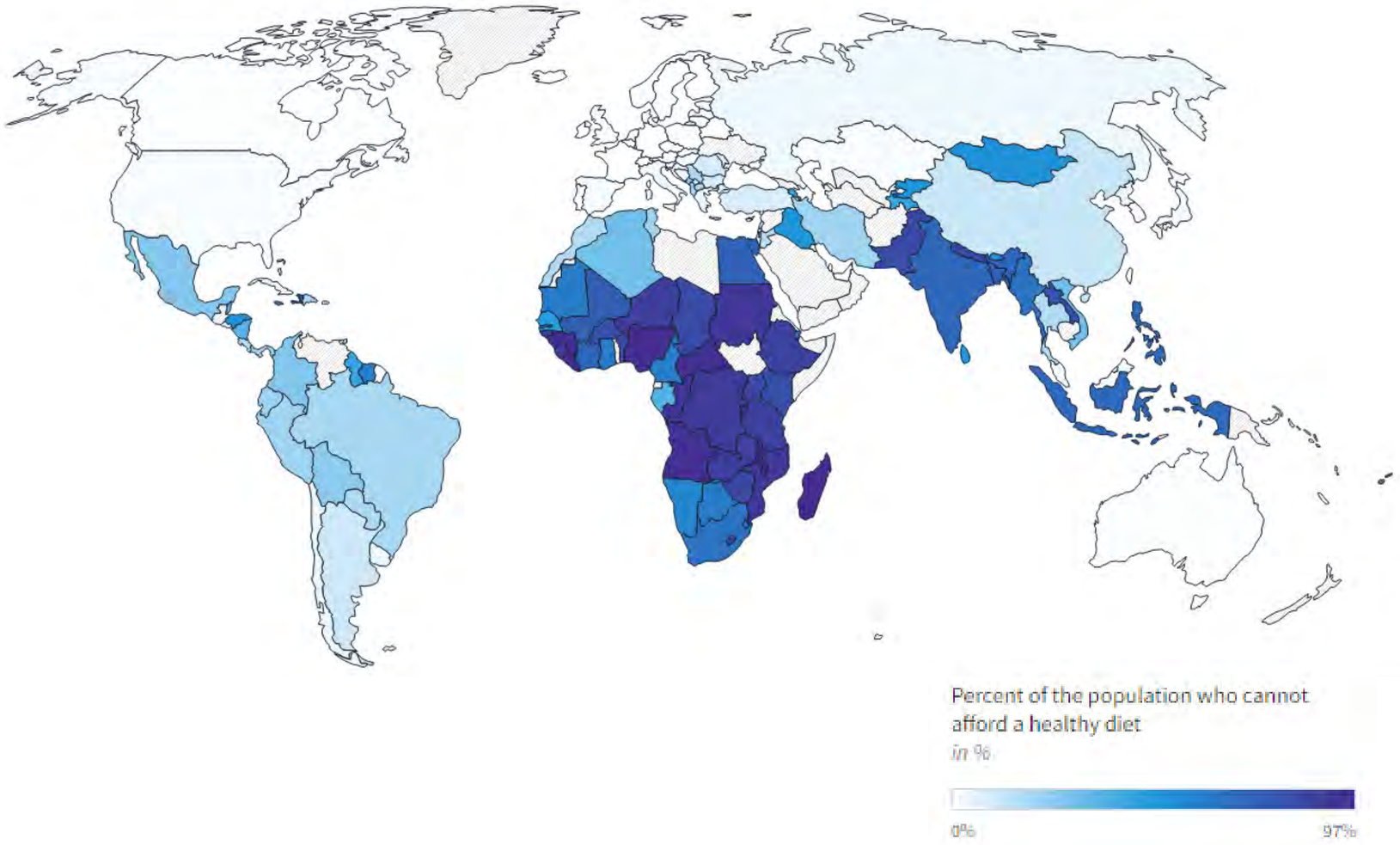
Healthy diets are unaffordable for most people in Africa and Asia.

Low income + inadequate year-round supply of safe and diverse fruits and vegetables contribute to **making healthy diets unaffordable for 3 billion people** worldwide.



Double burden of malnutrition globally

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Sub-Saharan Arica and South Asia have the largest increases in the double burden of malnutrition among higher wealth households

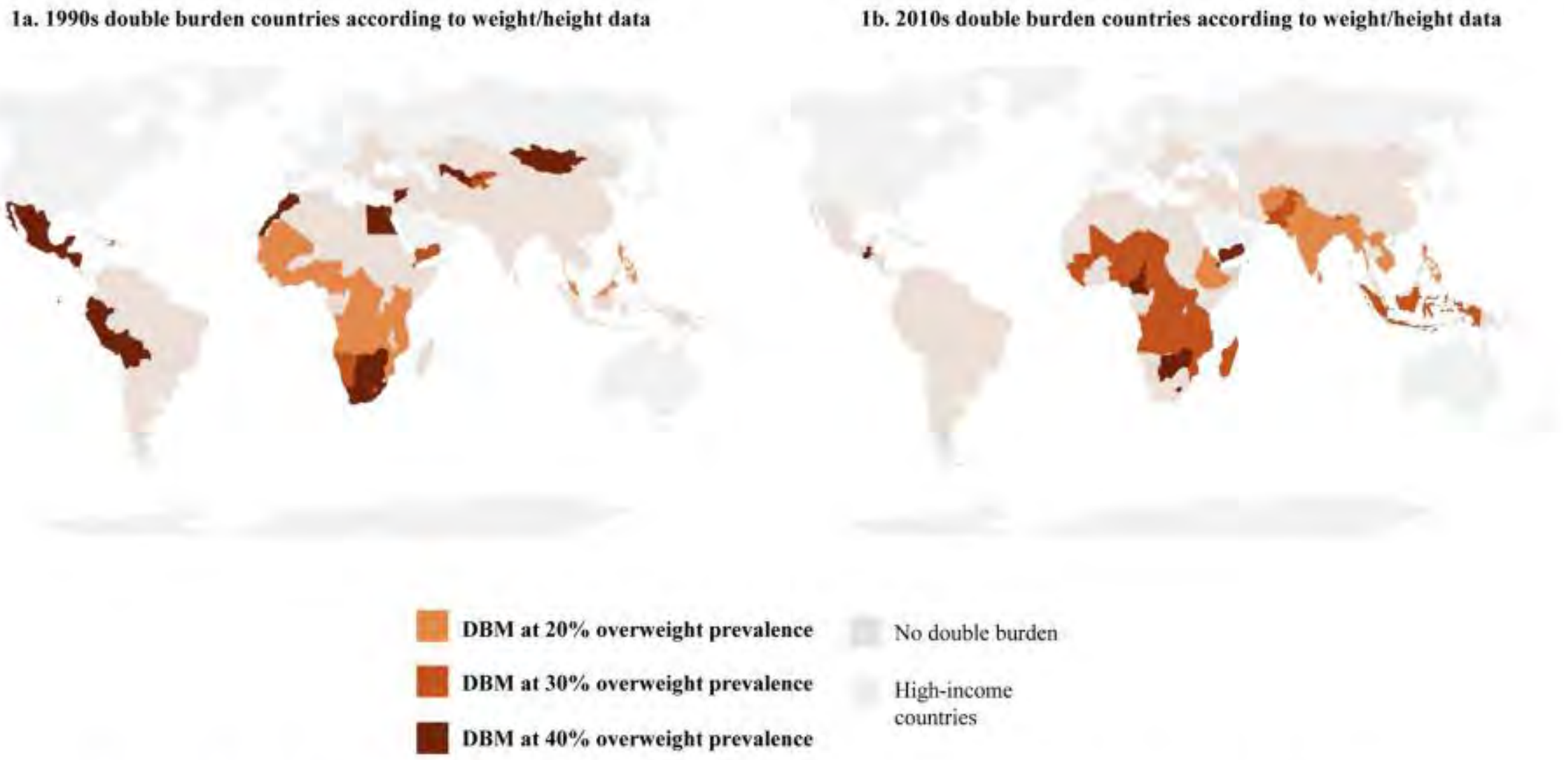
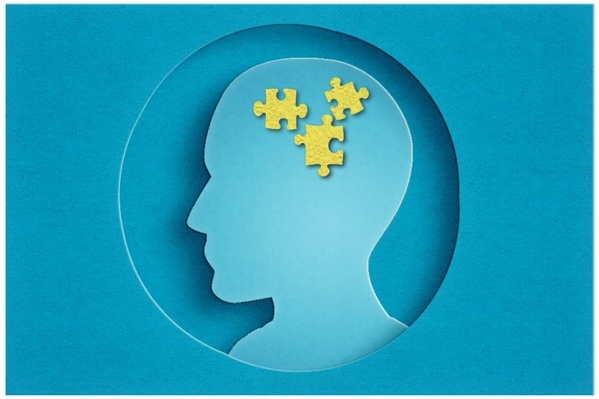


Figure 1. The global double burden of malnutrition in low- and middle-income countries based on 1990s and 2010s weight and height data*
(using UNICEF, WHO, World Bank, and NCD-RisC estimates, supplemented with selected DHS and other country direct measures)
* Double burden of malnutrition (DBM) = at least 1 child, adolescent, or adult in household with severe levels of wasting/stunting/thinness and 1 with overweight/obesity (shown at 20%, 30%, or 40% overweight prevalence)

[1]Popkin, 2020

How can we increase fruit and vegetable intake?



Barriers to diets rich in fruits and vegetables[1]

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Barriers - broad categories[1]

Sociodemographic
income, education, gender, age

Socio-environmental
Parental/peer influence, support, stress, perceptions, cost

Personal
time, skills, habits, preferences, knowledge and attitudes

Macrosystems
trade, marketing, food safety, policies

Barriers identified through reviews, stakeholder interviews and consultations in FRESH Focal Countries

Cost

Availability

Perceptions

Time

Habits

Preferences

Seasonality

Food safety

[1]Kaur, 2022

Options for change – targeting

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Establishment of preferences
Dietary preferences are influenced in utero[1] and solidified by age three[2]
Early habits persist into adulthood[3,4]

Likelihood of change
Adolescence can be opportune time for influencing health behaviors as they gain independence and agency[5]

Role in household and influence over what is prepared at home
Influencing women's preferences and empowering them could improve all household members' diets especially their children's[6] given their central role in food preparation.

[1]Spahn et al, 2019;2 Ventura and Worobey, 2013; 3Craigie et al, 2011; 4Lien et al, 2001; [5] Viner et al, 2015; [6]Quisumbing et al, 2021

Options for change – delivery platforms

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Social assistance programs
Investments in SAPs are increasing as is interest in making these types of programs deliver on more than food security and poverty alleviation

Schools
Schools offer a platform for both provision of education and can also provide direct influence over dietary intake through school meals and/or modifying the school food environment

Primary care
Information provided during primary health visits (e.g. prenatal visits) can be influential in changing knowledge and practices

Community and household level
Although commonly used platforms, evidence is mixed

[1]Spahn et al, 2019;2 Ventura and Worobey, 2013; 3Craigie et al, 2011; 4Lien et al, 2001; [5] Viner et al, 2015; [6]Quisumbing et al, 2021

Options for change – types of interventions

- Transfers
  - Cash-based transfers
  - School meals programs
- Social and behavioral change communication (SBCC)
- Digital
- Home or community agriculture interventions
- Multicomponent
- Food systems approaches

Options for change – Transfers provided through Social Assistance Programs (SAPs)

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Cash or in-kind transfers can improve dietary outcomes among women and children

- However, impacts more likely for women's diet diversity compared to children's (78% vs. 39% of SAPs studied had positive impacts)[1]
- For children - likely need complementary program components such as SBCC, targeting to women and/or children directly, provision of both household and individual transfers[2]
- Evidence suggesting that direct provision of fruits and vegetables/setting standards for school meal programs can improve intake

More rigorous evidence of the impact of these types of approaches, how impact is achieved, and cost-effectiveness of different approaches is needed

[1]Olney et al, 2022; [2]Olney et al, unpublished

Options for change – Social and Behavior Change Communication (SBCC)

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SBCC Successes:

Behavior change techniques (using an example from complementary feeding)[2] are more likely to be effective if:

- offer social support
- create enabling physical environments (ag inputs, transfers)
- improve self-efficacy through self-monitoring, goal setting, rehearsal and problem-solving

SBCC challenges:

- Program impact pathways are not well-defined[1]
- Implementation bottlenecks are often not considered[1]
- Lack of details in publications to foster replicability[3]
- Too heavy of a focus on nutrition education and not enough related to social support and creating enabling environments[3]
- To be most effective, likely need multichannel approaches[4]

SBCC is likely necessary but not sufficient to increase fruit and vegetable intake, especially in resource constrained environments

[1]Fabrizio, van Liere, and Pelto, 2014; [2]Girard et al, 2019; [3]Sanghvi et al, 2017

Options for change – homestead agriculture programs

Homestead agriculture programs can increase intake of fruit and vegetables and improve maternal and child dietary diversity[1,2]

- However, more likely to be effective in improving diet and nutrition outcomes when targeted to women, coupled with SBCC, actions to improve women's empowerment and other complementary program components[2]
- Limited evidence of spillover and sustained impacts[3,4]

[1]Girard-Webb, 2015; [2]Ruel, et al 2018; [3]Dillon et al, 2020; [4]Bliznashka et al, 2022

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Options for change – food systems approach (example: FRESH)

DEMAND → FOOD ENVIRONMENT → SUPPLY

- Nutrition, health & food security
- Poverty reduction, livelihoods & jobs
- Climate adaptation & mitigation
- Enviro health & biodiversity
- Gender equality, youth & social inclusion

FRESH End-to-End Approach

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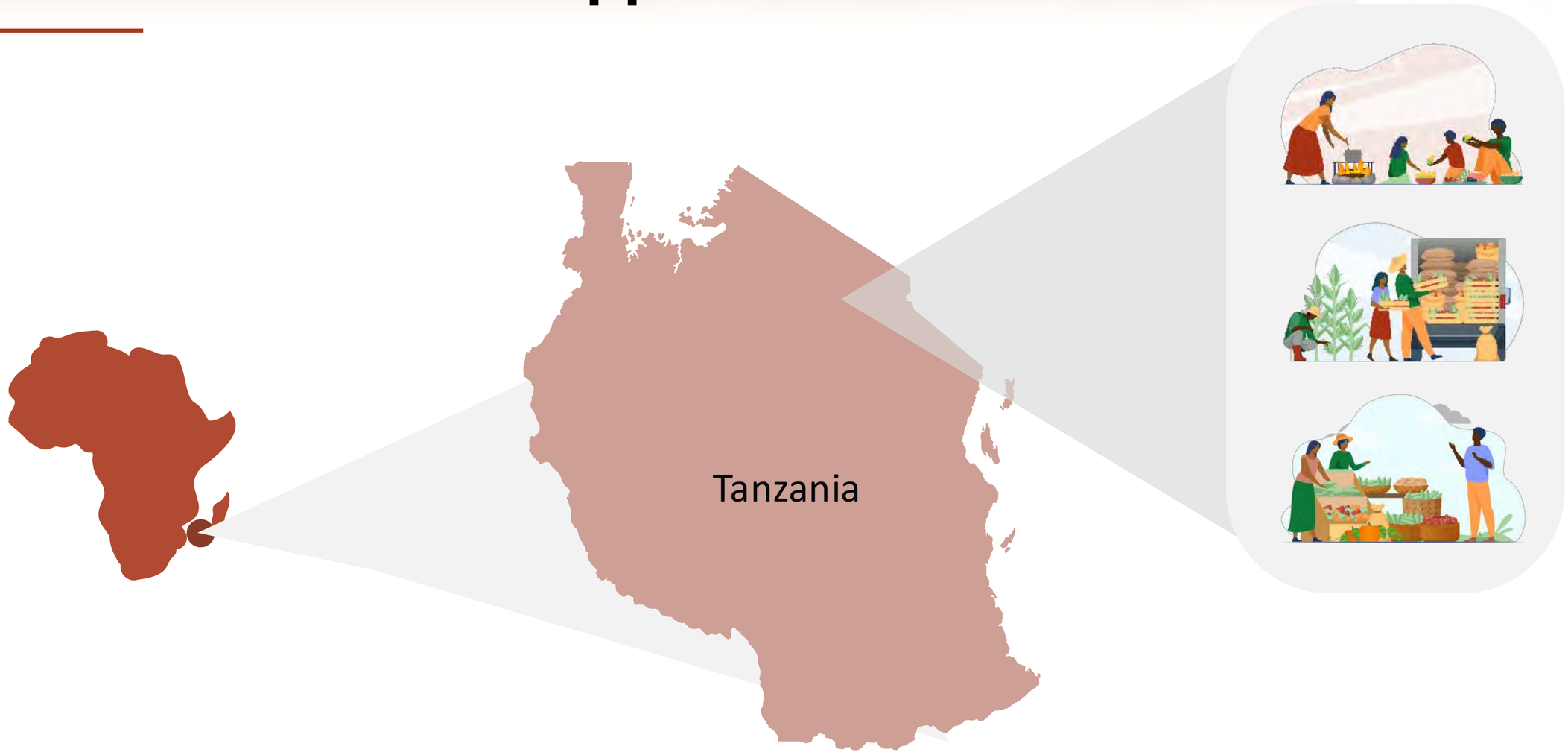
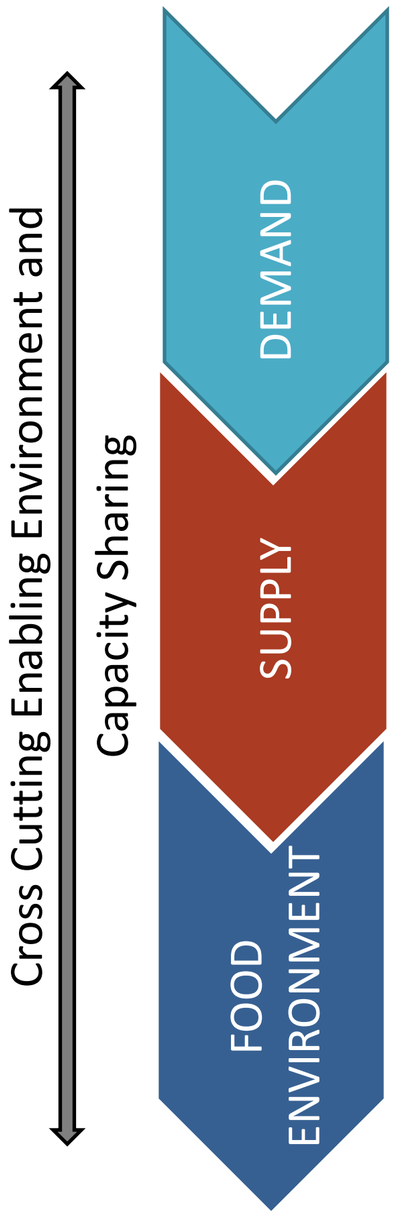


FRESH Focal Countries – Tanzania, Benin, Sri Lanka and the Philippines

Countries selected based on CGIAR and/or WorldVeg presence, co-occurrence of micronutrient deficiencies and obesity, strong partnerships with local partners across the food system, country priorities related to agriculture and nutrition and potential to demonstrate the proof of concept of co-location of interventions across the food system

FRESH Initiative Theory of Change

End to End Approach



End of Initiative Outcomes (Initial 3 years within FRESH)

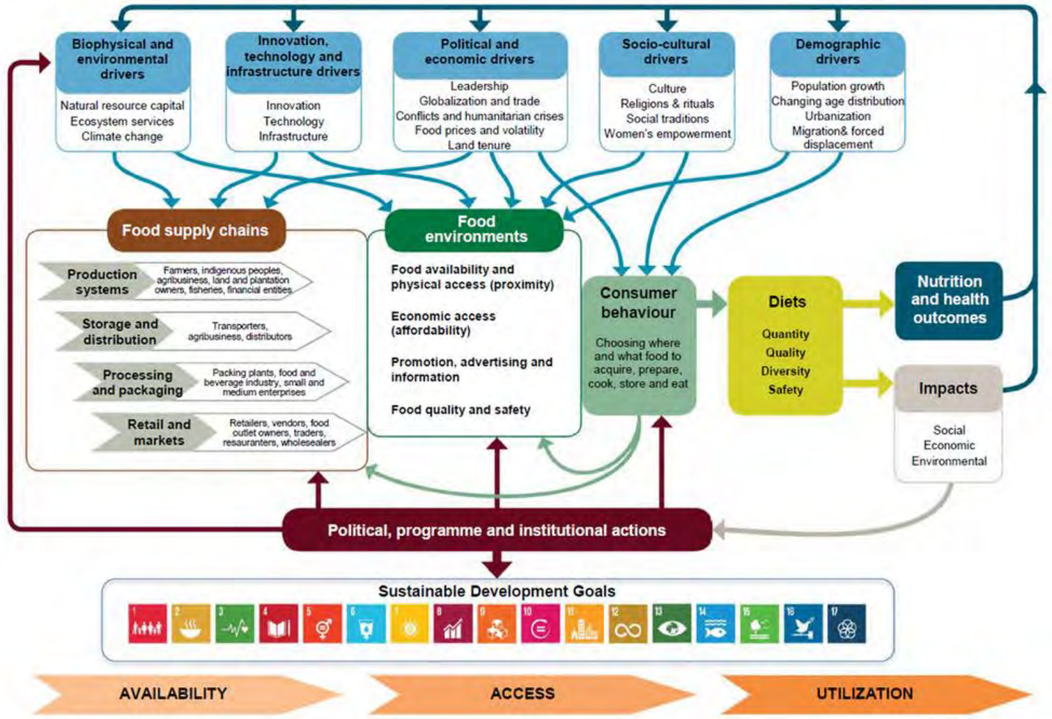
- Key actors are actively engaged in designing and testing interventions to increase F&V intake

- 10,000 farmers (50% women) adopt safe and sustainable vegetable production practices
- 10,000 farmers (50% women) adopt improved climate-resilient vegetable cultivars that align with consumer, farmer and other value chain actor preferences
- Private sector partners co-design and pilot innovations to reduce post-harvest losses and/or improve food safety

- Key actors are actively engaged in designing and testing interventions to increase accessibility and affordability of F&V

- At least 4 national-level programs, regulations, laws or policies across 4 countries prioritize F&V

Micro to macro food systems and linkages with other systems



Health

Education

Social Protection

Summary

- Dietary habits are difficult to change, BUT there are many potentially effective means to support positive change, although evidence from low- and middle-income countries is limited.
- Limited evidence of the effectiveness of food systems approaches in eliciting positive dietary changes, BUT theoretically plausible and MAYBE more sustainable
- For change to be successful, significantly more investments in context specific multicomponent and/or food systems solutions coupled with robust evidence generation and policy support are needed to:
  - Elicit change
  - Sustain change
  - Scale change

Thank You!

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FRESH Partners and Funders

Global	Benin	Tanzania	Sri Lanka	Philippines
• CGIAR Centers (IFPRI, ABC, CIMMYT, CIP, IWMI (country coordinator, Sri Lanka))	• *Institut national des Recherches agricoles du Bénin* (INRAB)	• Sokoine University of Agriculture	• Wayamba University of Sri Lanka	• Department of Science and Technology-Food and Nutrition Research Institute (DOST-FNRI) (Country Coordinator, Philippines)
• World Vegetable Center (country coordinators Benin and Tanzania)	• *Centre de coopération internationale en recherche agronomique pour le développement (*CIRAD)	• Tanzania Agricultural Research Institute (TARI)	• University of Peradeniya	• University of Mindanao
• **Applied Horticultural Research**	• University of Abomey Calavi	• National Irrigation Commission	• World Food Programme	• University of the Philippines Los Baños
• **Wageningen University and Research**	• University Parakou	• Tanzania Horticultural Association (TAHA)	• Horticultural Crop Research and Development Institute (HORDI)	• Bureau of Plant Industry (BPI)
• **University of California, Davis**	• African Breeding Vegetable Council	• Tanzania Plant Health and Pesticides Authority	• Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI)	• International Institute of Rural Reconstruction
• **Institute of Development Studies**	• Genetic Biotechnology & Seed Science Laboratory		• Foundation of Health Promotion	• Asia & Pacific Seed Alliance Consortium
• **University of Sydney**			• Medical Research Institute (MRI)	• IPB – University of the Philippines Los Baños
			• Colombo Urban Lab	
			• Landmark Seed	
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WorldVeg

CGIAR INITIATIVE ON Fruit and Vegetables for Sustainable Healthy Diets

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