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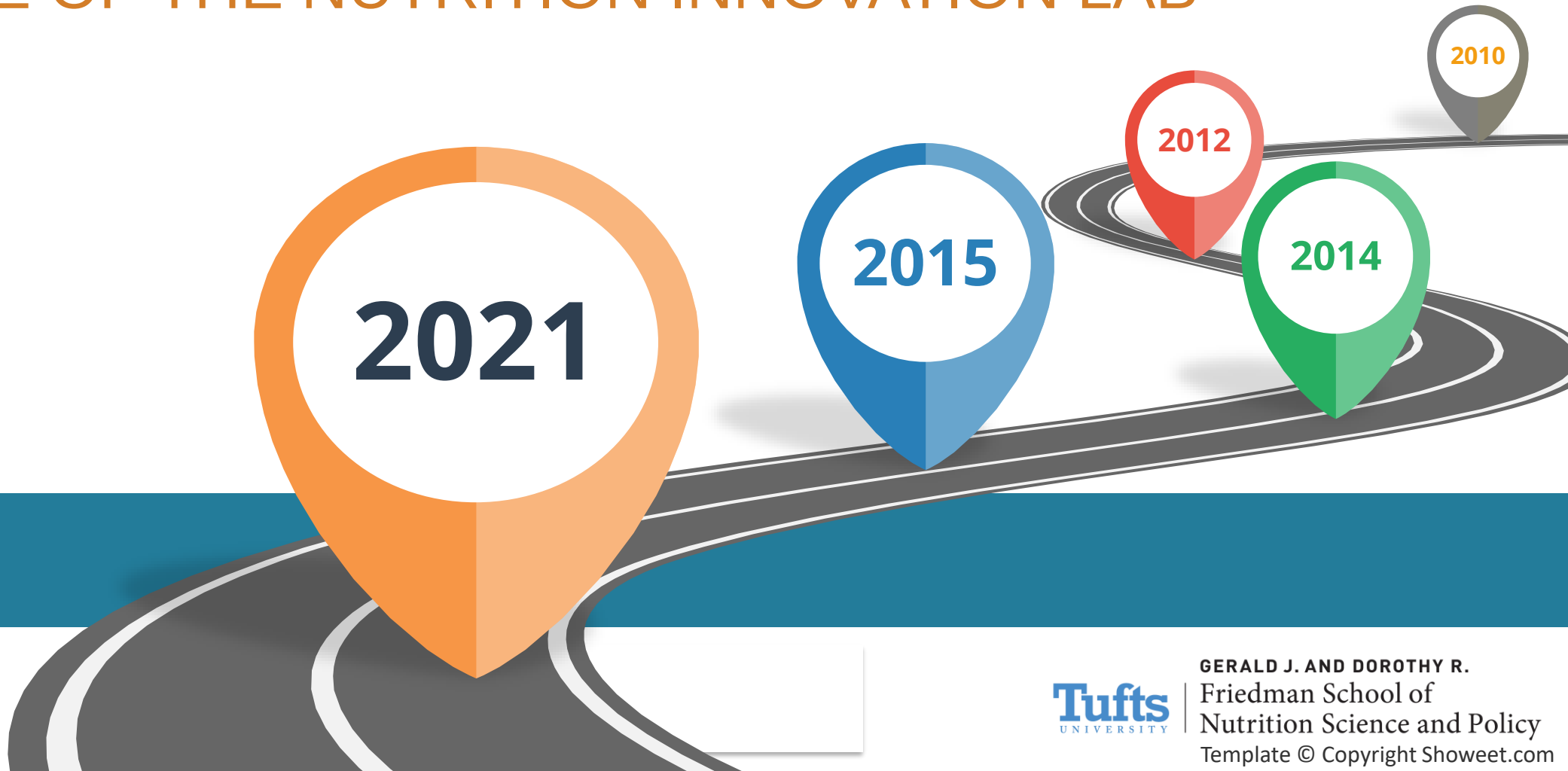
BACK TO THE FUTURE:
A DECADE OF THE NUTRITION INNOVATION LAB



Patrick Webb, PhD.
16 Sep 2021

USAID
FROM THE AMERICAN PEOPLE

Tufts UNIVERSITY | GERALD J. AND DOROTHY R. Friedman School of Nutrition Science and Policy

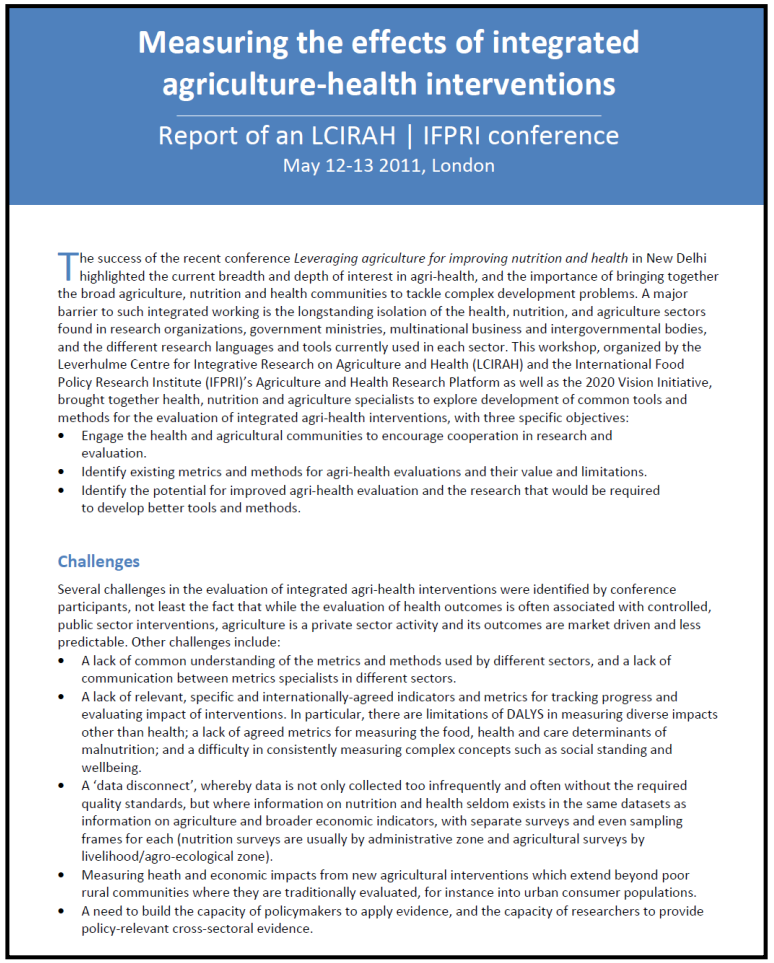
THE WORLD IN 2010…

- "There is an urgent need to provide evidence-based information on food-based strategies and systems for enhanced nutrition." *19th Intl. Congress on Nutrition (2009)*

- "The logic of the transmission mechanisms between agricultural production and nutritional outcomes is not…clear." *John Newman, World Bank (2009)*

- "The most urgent gaps relate to…multisectoral interventions addressing food availability and household economics that have not yet focused on reducing undernutrition."
  Nepal Nutrition Assessment & Gap Analysis (2009)

We need "*innovative and rigorous evaluation designs as alternatives to RCTs to measure impacts and understand causality in agri-health interventions*."



Measuring the effects of integrated agriculture-health interventions

Report of an LCIRAH | IFPRI conference
May 12-13 2011, London

The success of the recent conference *Leveraging agriculture for improving nutrition and health* in New Delhi highlighted the current breadth and depth of interest in agri-health, and the importance of bringing together the broad agriculture, nutrition and health communities to tackle complex development problems. A major barrier to such integrated working is the longstanding isolation of the health, nutrition, and agriculture sectors found in research organizations, government ministries, multinational business and intergovernmental bodies, and the different research languages and tools currently used in each sector. This workshop, organized by the Leverhulme Centre for Integrative Research on Agriculture and Health (LCIRAH) and the International Food Policy Research Institute (IFPRI)'s Agriculture and Health Research Platform as well as the 2020 Vision Initiative, brought together health, nutrition and agriculture specialists to explore development of common tools and methods for the evaluation of integrated agri-health interventions, with three specific objectives:

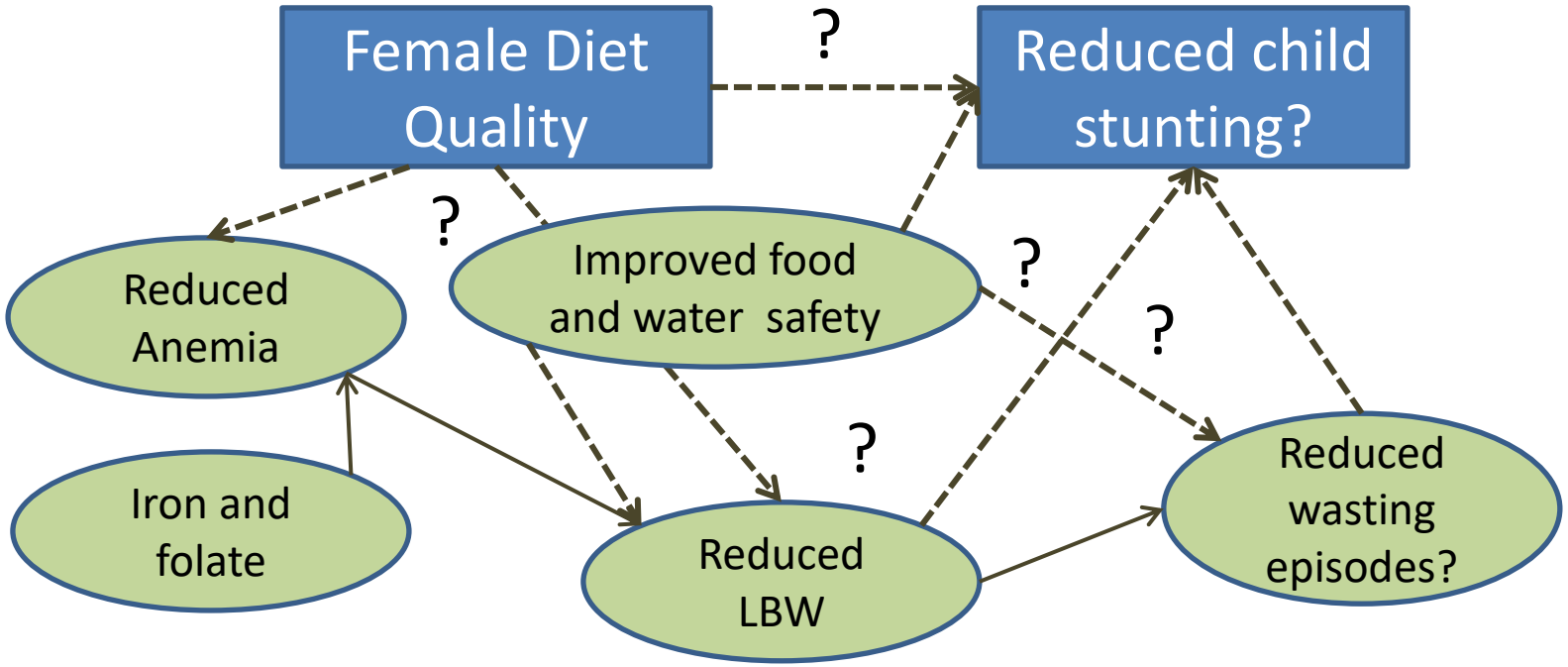
- Engage the health and agricultural communities to encourage cooperation in research and evaluation.
- Identify existing metrics and methods for agri-health evaluations and their value and limitations.
- Identify the potential for improved agri-health evaluation and the research that would be required to develop better tools and methods.

Challenges

Several challenges in the evaluation of integrated agri-health interventions were identified by conference participants, not least the fact that while the evaluation of health outcomes is often associated with controlled, public sector interventions, agriculture is a private sector activity and its outcomes are market driven and less predictable. Other challenges include:

- A lack of common understanding of the metrics and methods used by different sectors, and a lack of communication between metrics specialists in different sectors.
- A lack of relevant, specific and internationally-agreed indicators and metrics for tracking progress and evaluating impact of interventions. In particular, there are limitations of DALYS in measuring diverse impacts other than health; a lack of agreed metrics for measuring the food, health and care determinants of malnutrition; and a difficulty in consistently measuring complex concepts such as social standing and wellbeing.
- A 'data disconnect', whereby data is not only collected too infrequently and often without the required quality standards, but where information on nutrition and health seldom exists in the same datasets as information on agriculture and broader economic indicators, with separate surveys and even sampling frames for each (nutrition surveys are usually by administrative zone and agricultural surveys by livelihood/agro-ecological zone).
- Measuring heath and economic impacts from new agricultural interventions which extend beyond poor rural communities where they are traditionally evaluated, for instance into urban consumer populations.
- A need to build the capacity of policymakers to apply evidence, and the capacity of researchers to provide policy-relevant cross-sectoral evidence.

UNDERSTANDING THE PATHWAYS:
Collaborative Research Support Program (CRSP)



May 2011

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RESEARCH

Building rigorous evidence base for multisector programming, agriculture interventions, food safety

ENGAGEMENT

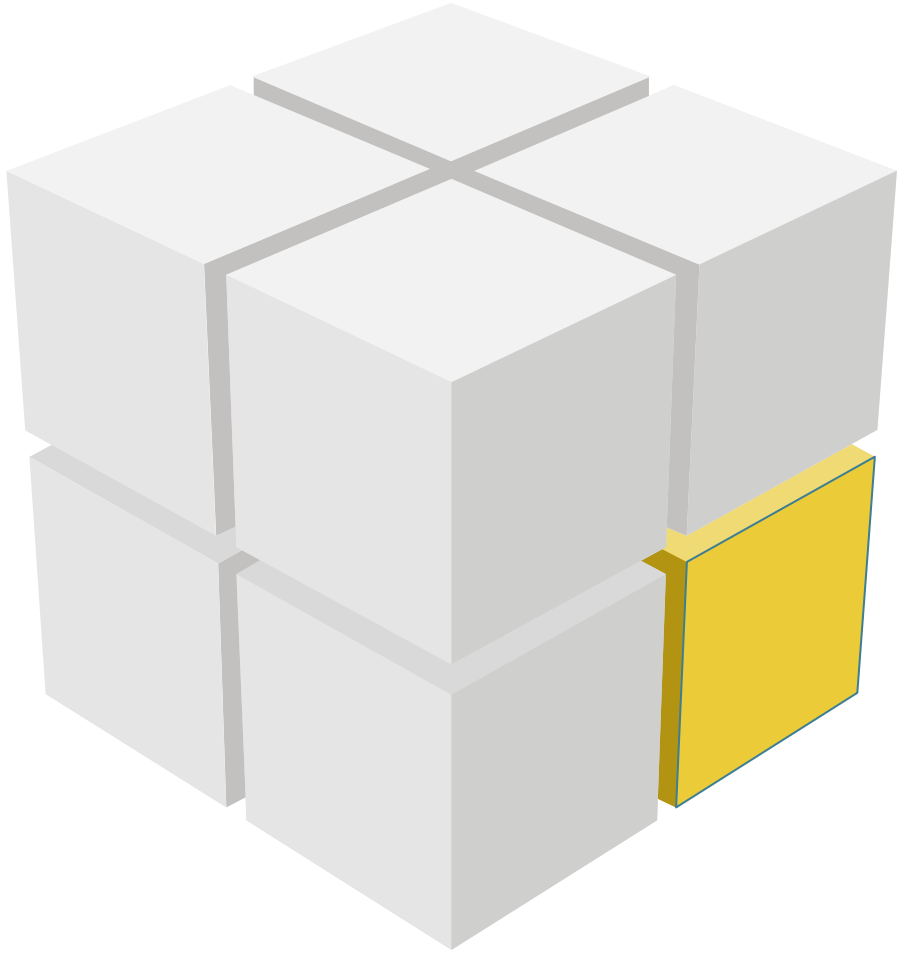
Policymakers, practitioners, donors, scientific peers, private sector innovators

CAPACITY BUILDING

Academic and technical training, skills labs and workshops, curriculum accreditation, study design

Metrics Innovation

New indices (NGI), new methods (energy expenditure), testing approaches (dried blood spots, cognitive outcomes)



RESEARCH

- Agriculture-to-nutrition pathways.
- Biological Mechanisms impacting nutrition.
- Technologies, markets, innovations.

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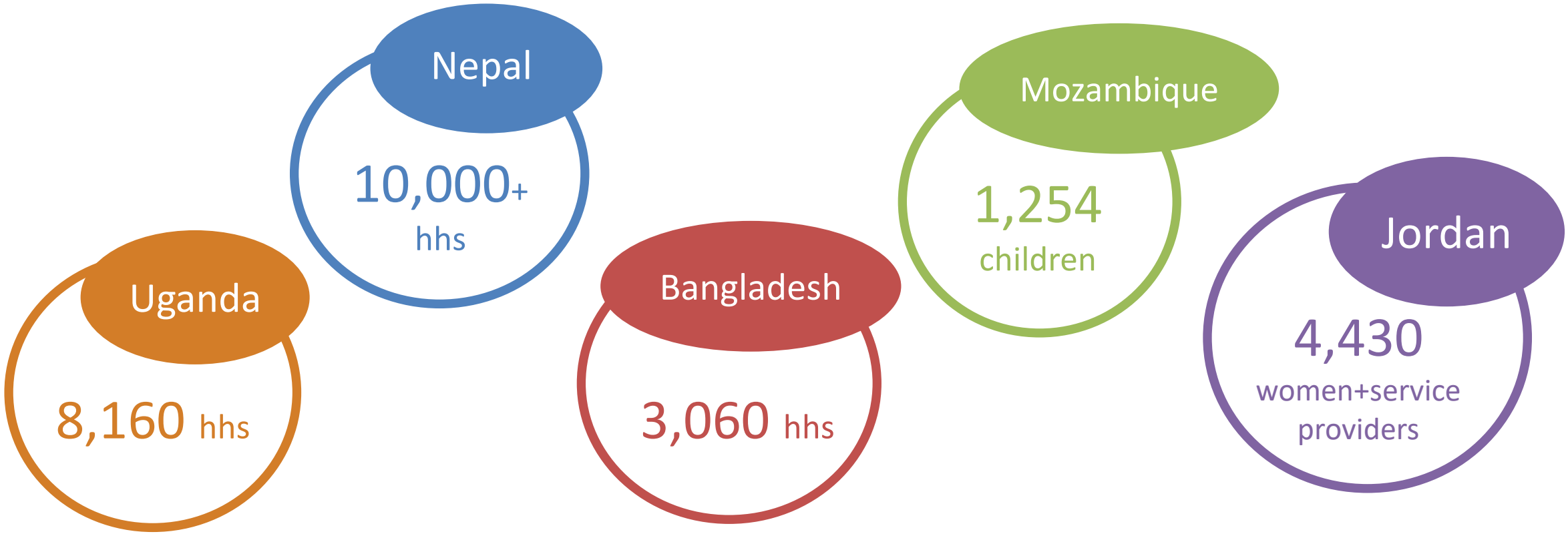
Larger survey samples, stronger results



Many studies (cohorts and panels) included 4-9 repeat rounds: e.g., Uganda birth cohort involved 7 rounds generating >18,000 data points; Nepal's AflaCohort was 9 rounds = 14,669 data points.

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MULTISECTOR PROGRAMMING IMPACTS ON NUTRITION

IMPROVED DIETS

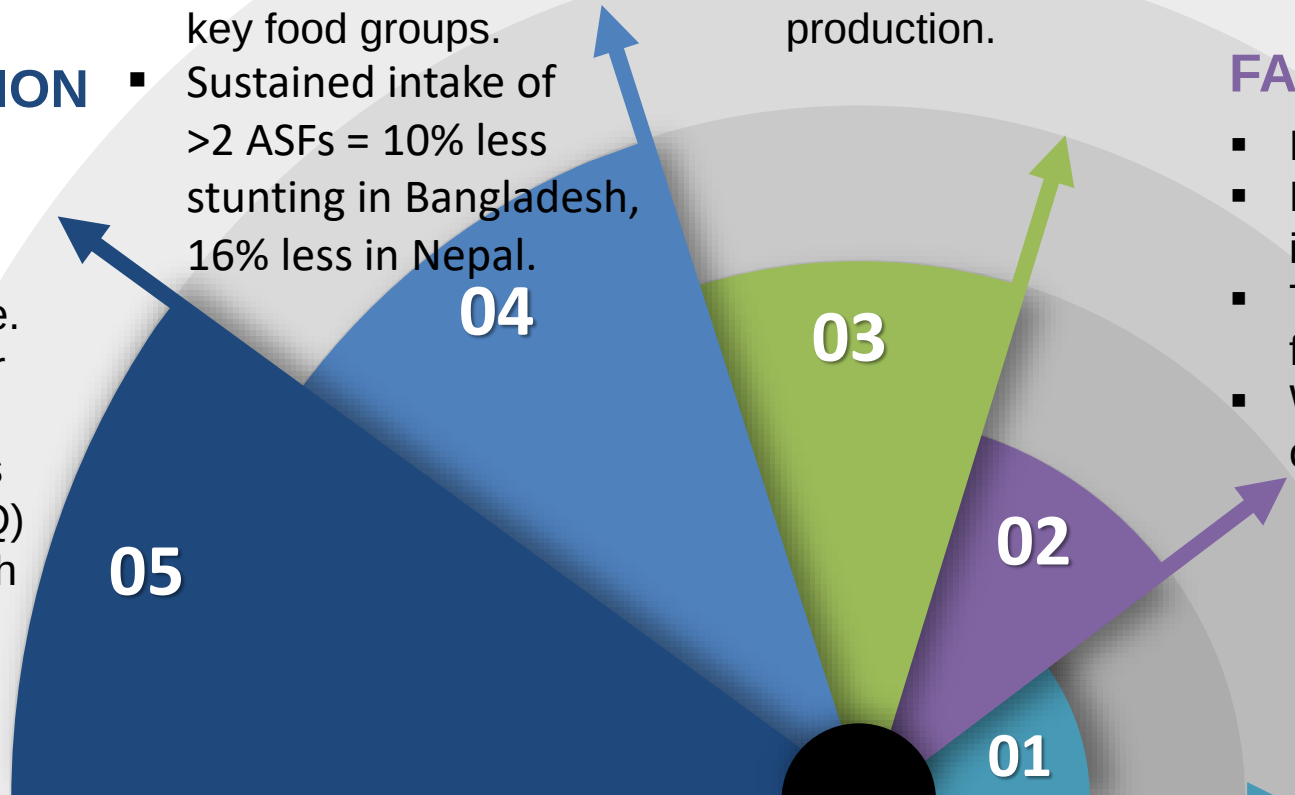
- Significant rise in: Women's diet diversity (DD), child's DD, ASF intake, minimum intake of key food groups.
- Sustained intake of >2 ASFs = 10% less stunting in Bangladesh, 16% less in Nepal.

MARKET ENGAGEMENT

- Women engaged in value-add food production and sales (more distant markets).
- *Affordability and proximity* both improve diets, choice enhanced by SBC, income and own production.

BETTER NUTRITION

- Not always… timeframe matters, and content of multisector package.
- Some gains only for children >24m.
- Cognitive outcomes also improved (ASQ)
- Effects work through birth outcomes, LBW, SGA, head circumference.



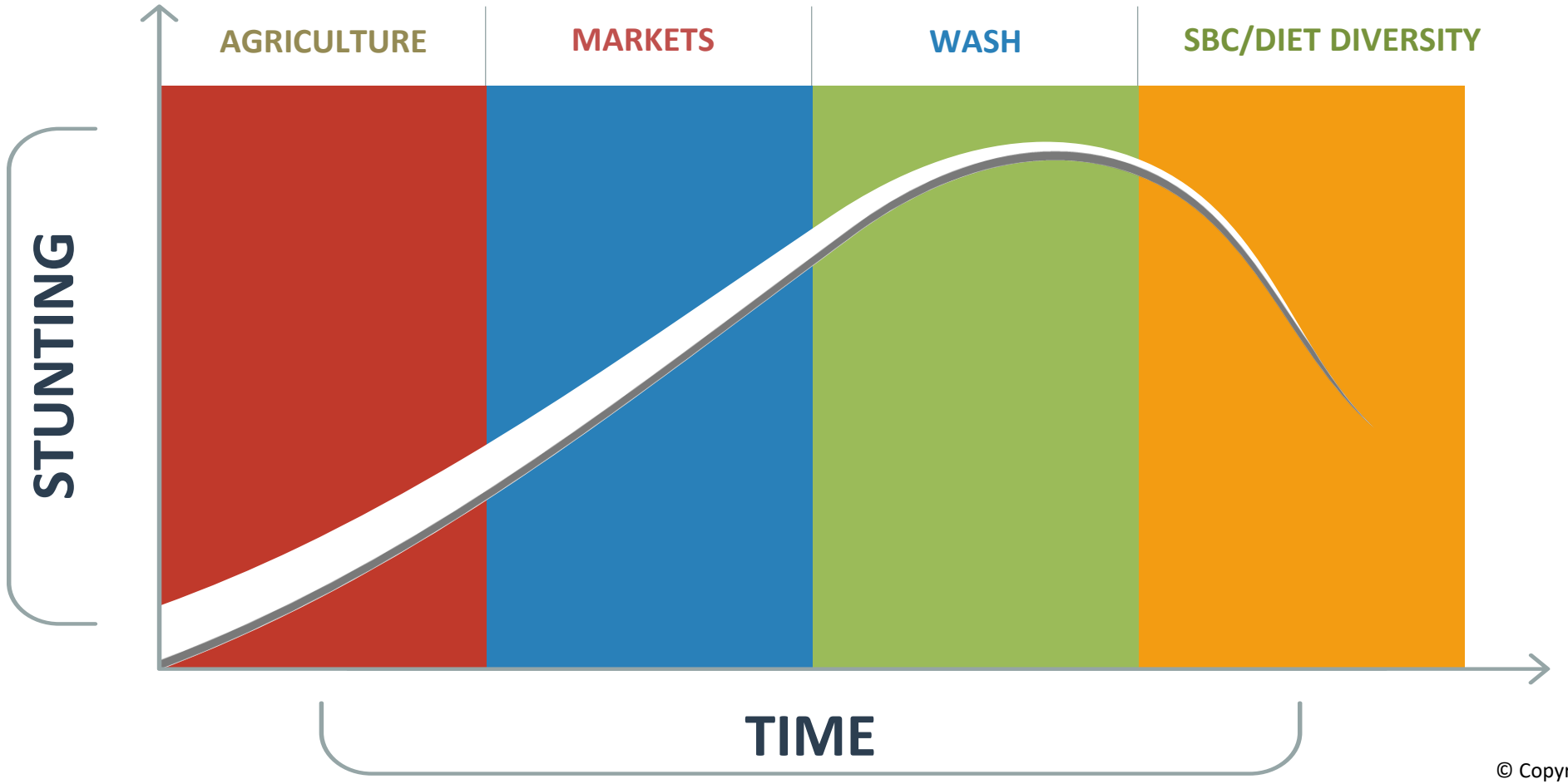
FARM DIVERSIFICATION

- Livestock species: up 31%***
- Linking horticulture with aquaculture increases income and intake of both
- Taking loans; joining finance groups: farm + nonfarm investment
- Women's *empowerment* from cash cropping

ADOPTING PRACTICES

- Row planting: up 15%***
- Fallow rotation: up 11%**
- Pest management: up 7%***

SECTOR INVESTMENTS TAKE DIFFERENT TIMES TO MATURE AND TO CONTRIBUTE TO NUTRITION



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BIOLOGICAL MECHANISMS

Maternal EED = shorter gestation and baby stunted @birth

Maternal AfB1 = SGA, baby stunted @birth, low WAZ, low head circumf.

Child AfB1 associated with higher ochratoxin A, and with higher EED.

Child AfB1 @birth = lower weight @3m, lower WHZ @6m

Child EED associated with poor linear growth, **high** DON, low iron status

IMPROVED FOOD PROCESSING AND STORAGE FOR IMPROVED NUTRITION

T	Traditional storage	▪ Child DD, 0.17*** ▪ Child HAZ, 0.02	▪ Buried pits, smoking of pots, chemical cleaners, sacks on floor.
D	Improved drying methods & tools	▪ Child DD, 0.15*** ▪ Child HAZ, 0.03***	▪ Sun drying on tarps, solar chimneys, smoking on racks.
P	Improved processing	▪ Child DD, 0.12** ▪ Child HAZ, 0.03**	▪ Screening out low-quality grains, removing mold, filleting fish.
IS	Improved storage	▪ Child DD, 0.152*** ▪ Child HAZ, 0.04***	▪ Scrubbing out containers, hermetically sealed bags, sealed sacks/airflow.

CAPACITY BUILDING

- **61** PhDs and Masters' degrees.
- Worked with **52** non-US universities.
- Engaged in government processes.
- Organized **~140** workshops, seminars, training on study methods.
- Active support to USAID GLEEs.
- Support to other ILs relating on nutrition, study design, proposals.

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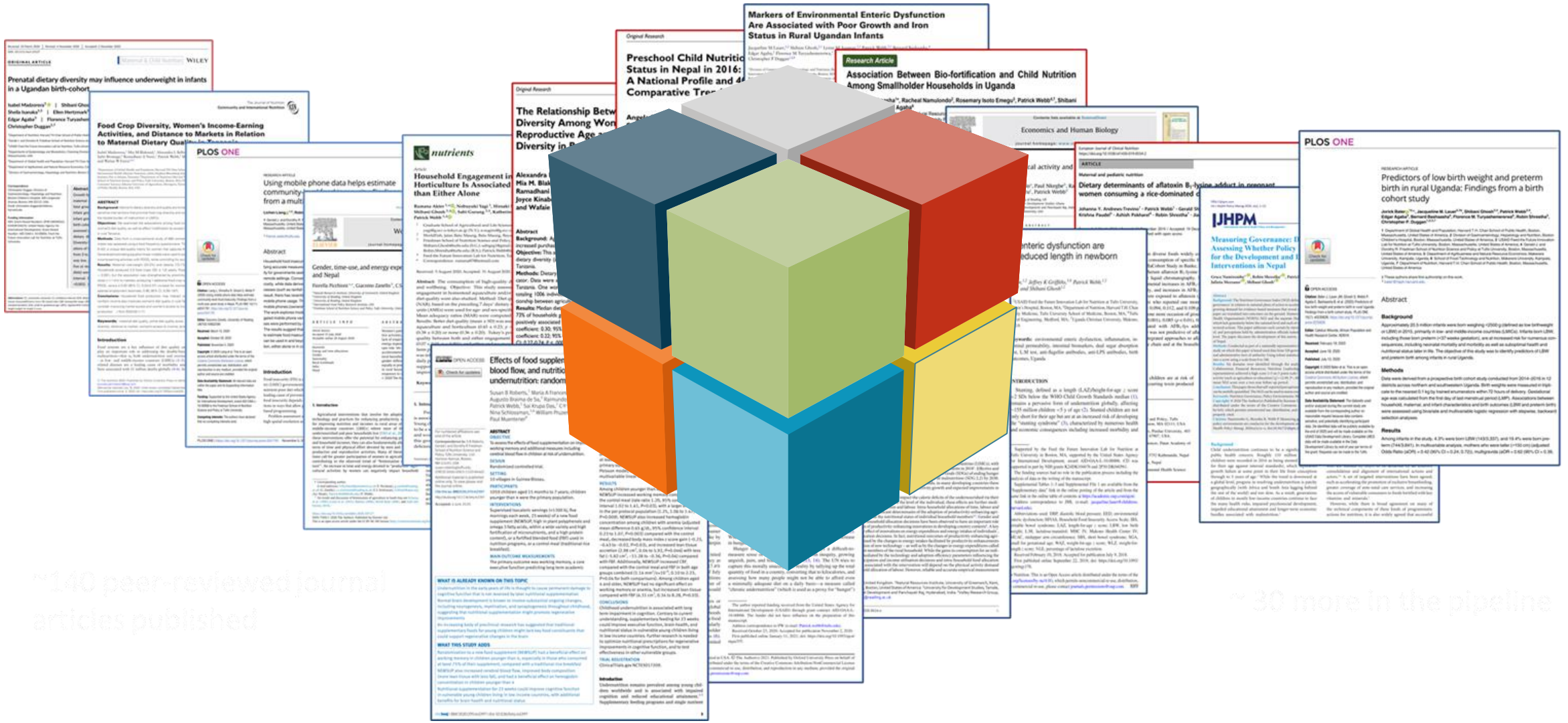
NUTRITION INNOVATION LAB OUTPUTS - PUBLISHED 2020



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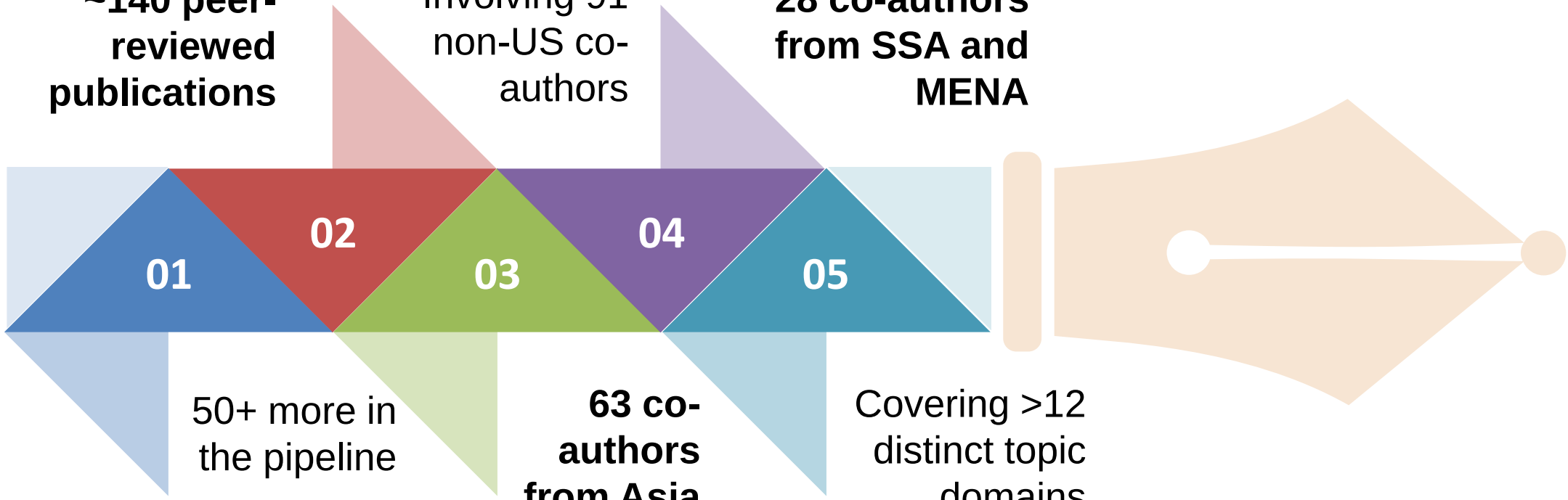
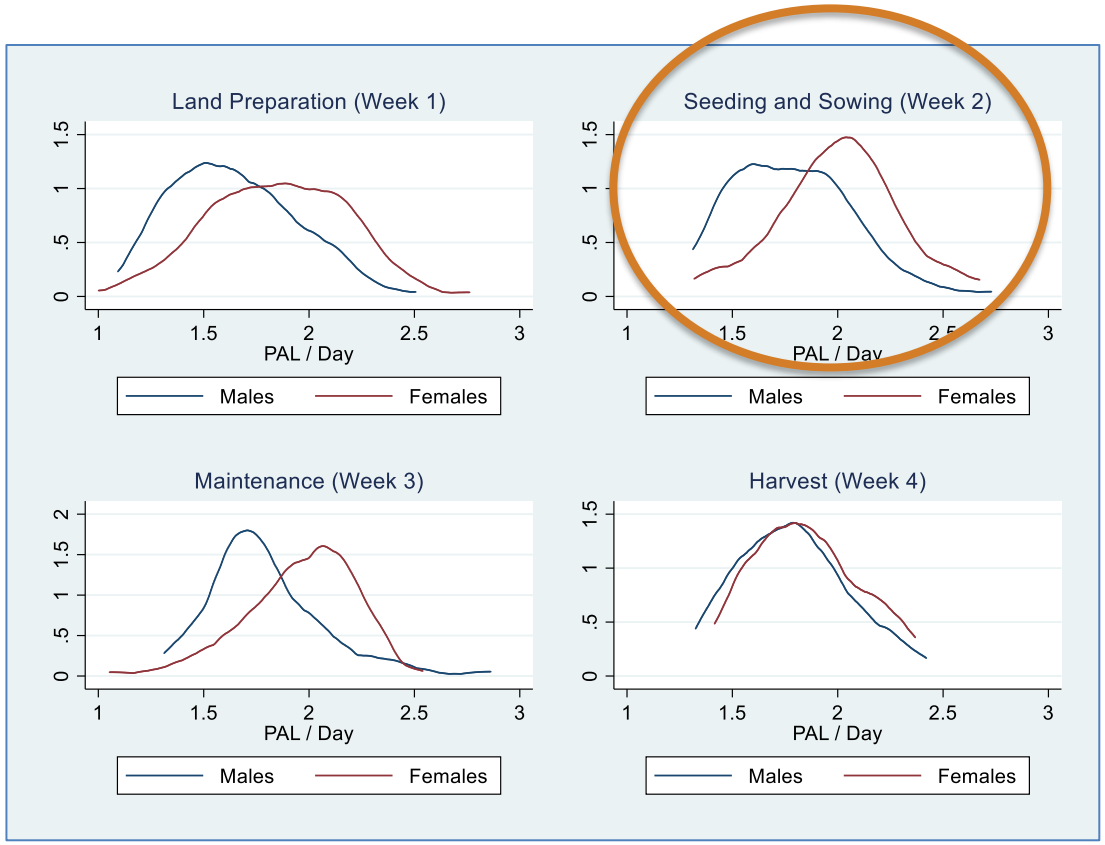
Building Capacity: From Study Design to Publication Skills



METRICS INNOVATIONS

- Index of nutrition ‘governance’.
- Energy expenditure.
- Cellphone use as proxy for food security.
- Resilience measure for nutrition security.
- Testing use of dried blood spots for measuring AfB1.

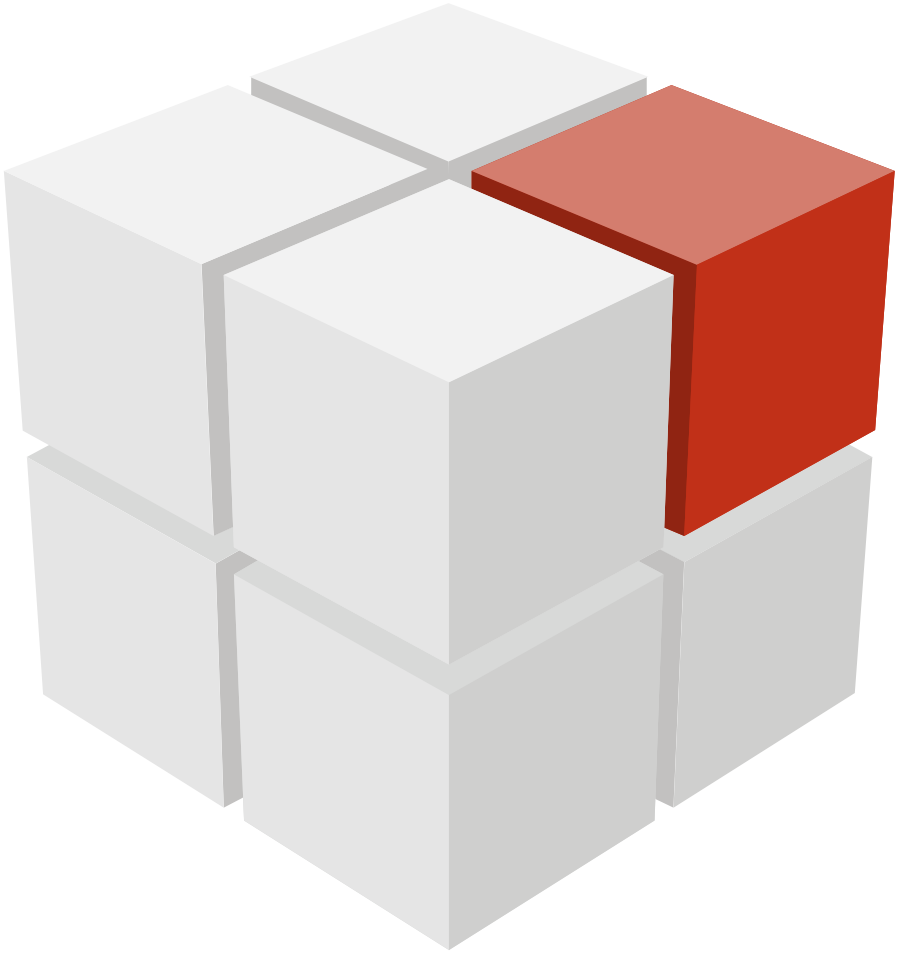

Land Preparation (Week 1)
Seeding and Sowing (Week 2)
Maintenance (Week 3)
Harvest (Week 4)
PAL / Day
Males
Females

Nutrition Governance Index

A one-point increase in the Index is significantly associated with **a 12% higher average HAZ** *in children >24 months old* two years later.

	HAZ				WHZ			
VARIABLE	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 1**	**Model 2**	**Model 3**	**M**
CHILD-LEVEL ESTIMATES								
Intercept	-1.49***	-1.70***	-1.64***	-1.68***	-0.75***	-1.92***	-1.86***	
Child's age								
>24 months		-1.51***	-1.52***	-1.51***		0.14***	0.14***	0.
≤ 24 months		*Ref*	*Ref*	*Ref*		*Ref*	*Ref*	*R*
Female child		-0.02	-0.02	-0.02		0.03	0.03	0.
CDDS^		-0.14***	-0.14***	-0.14***		-0.02***	-0.02***	-0
No fever#		0.04**	0.05**	0.05**		0.13***	0.14***	0.
Month of birth		-0.01**	-0.01**	-0.01**		-0.00	-0.00	-0
Mother's education		0.04***	0.04***	0.04***		0.01***	0.01***	0.
Mother's BMI		0.04***	0.04***	0.04***		0.06***	0.06***	0.
Mother's age		0.01***	0.01***	0.01***		-0.00*	-0.00*	-0
COMMUNITY-LEVEL ESTIMATES								
NGI (Z-score)			-0.02	-0.09			-0.05	-0
NGI (Z-score) & child's age								
NGI & >24months				0.12***				0.
NGI & ≤ 24months				*Ref*				*R*
Panel 2			-0.07**	-0.07***			-0.07***	-0
Panel 4			*Ref*	*Ref*			*Ref*	*R*
COVARIANCE PARAMETERS								
Intercept	0.116***	0.094***	0.094**	0.094**	0.199***	0.117**	0.115**	0.
Residual	1.555***	1.367***	1.365***	1.362***	0.950***	0.902***	0.901***	0.
ICC	0.07	0.06	0.06	0.06	0.17	0.11	0.11	0.
MODEL FIT STATISTICS								
AIC	42546.8	37608.4	37601.8	37574.4	30878.9	27854.5	27843.0	27
N	12950	11910	11910	11910	11046	10148	10148	10

Namirembe et al. (forthcoming)



ENGAGEMENT

- Direct and frequent interaction with **policymakers**.
- Close collaboration with in-country r**esearchers**.
- Global and national involvement in **dialogues**.
- Engagement with non-US **donors**.

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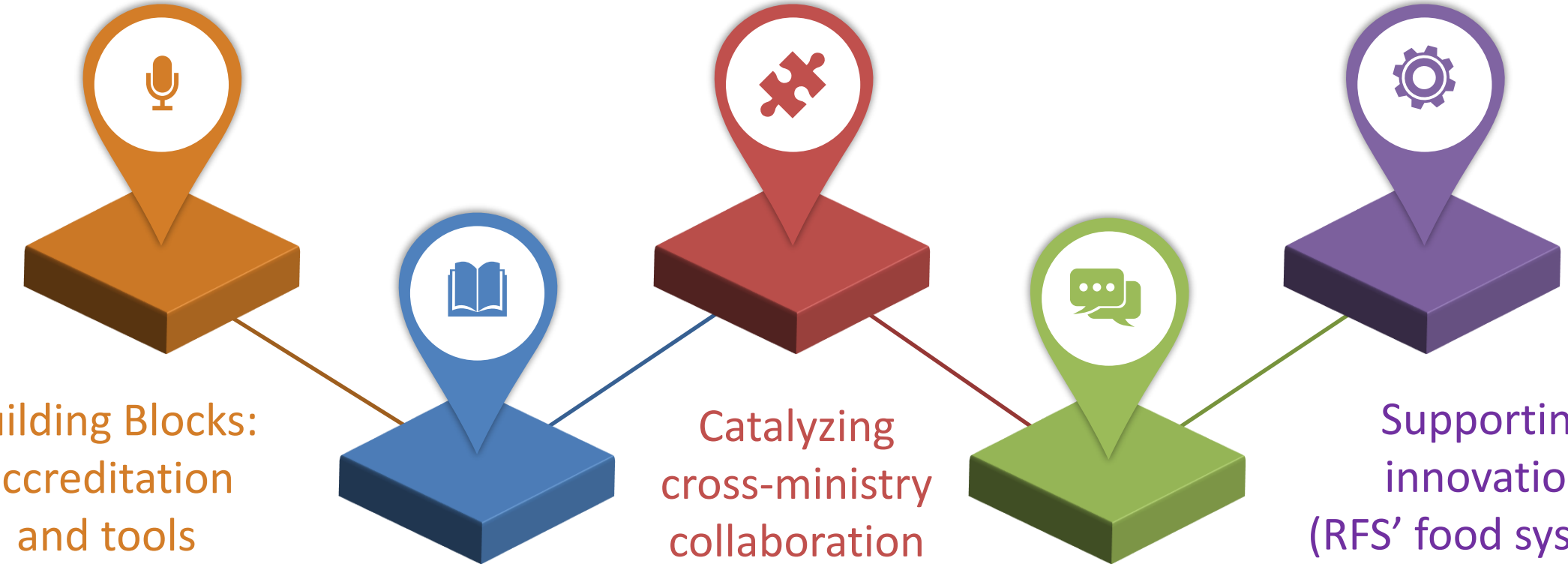
EXAMPLES OF ENGAGEMENT EFFECTIVENESS



Building Blocks: accreditation and tools (Malawi)

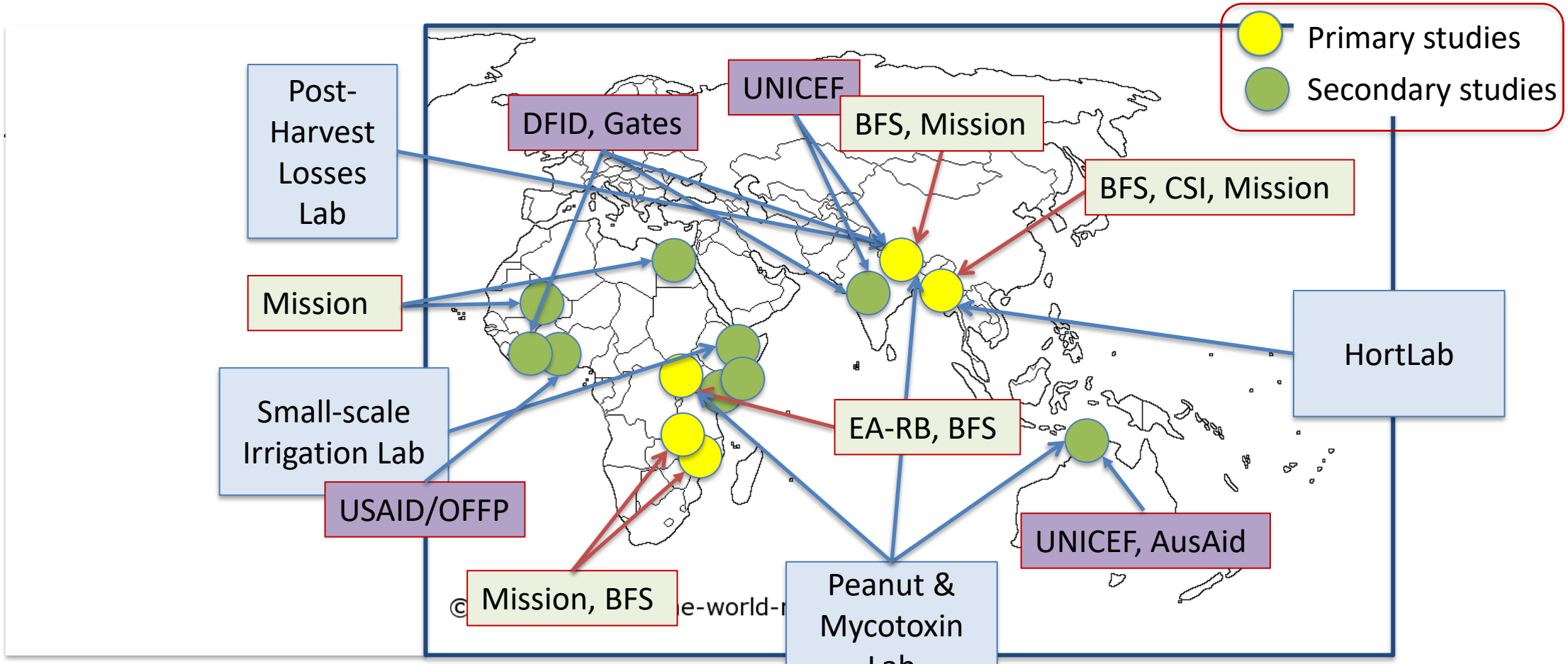
Curriculum and training (Bangalore)

Catalyzing cross-ministry collaboration (Nepal's mycotoxin strategy)

Helping build nutrition into other IL programs (Hort-IL; PHL-IL)

Supporting innovation (RFS' food systems framework)

LEVERAGING OTHER DONORS AND OTHER INNOVATION LAB WORK



GLOBAL AND LOCAL PARTNERS

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KEYS TO N-IL SUCCESS

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FOOD SYSTEMS – THINKING FORWARD

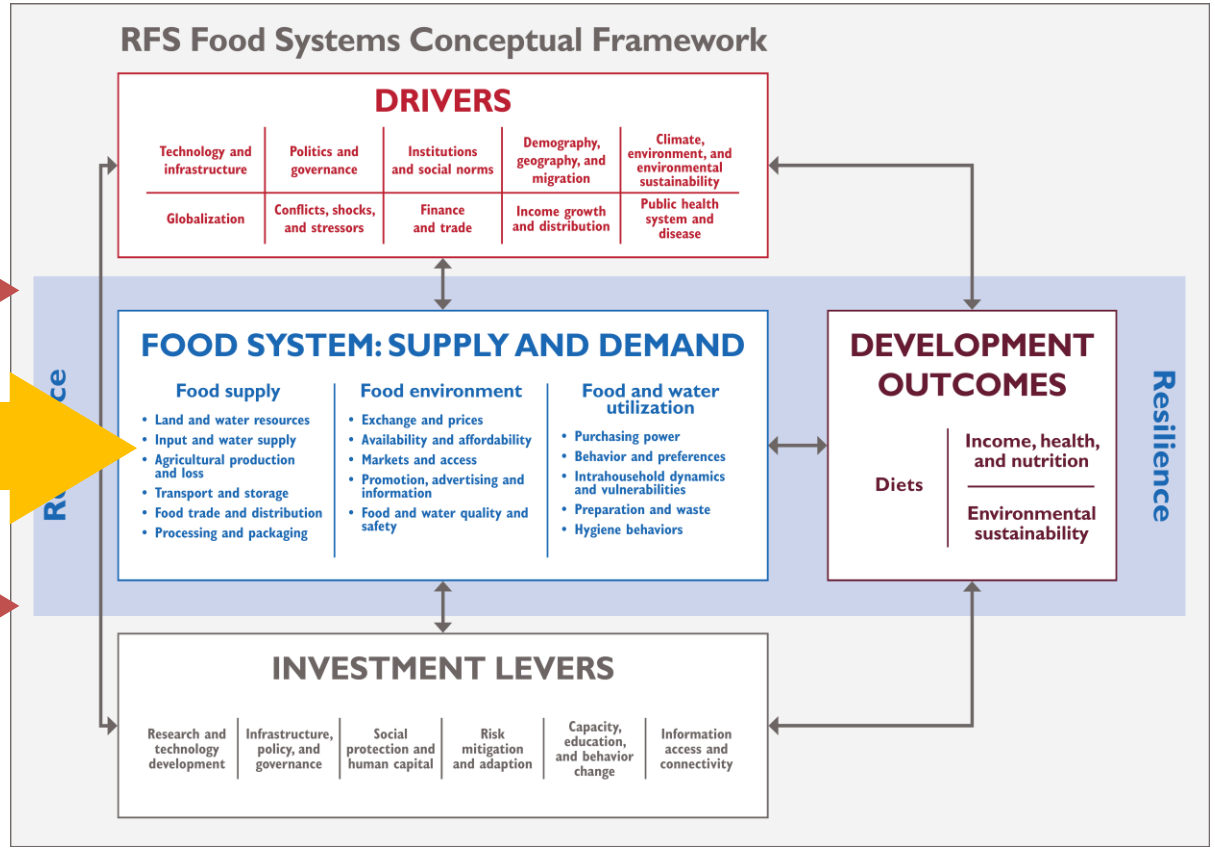
Which Investment Levers to Pull Next for Improved Nutrition?

Shaping the Drivers: Market level actions

Influencing the Food Environment

Food Safety; Food System Technologies

Beyond Stunting



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