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Agriculture and Nutrition Linkages: Implications for Multisectoral Programming

Looking Beyond a Decade of Accomplishments in Nutrition
NIL Legacy Event | September 16th, 2021

Beatrice Rogers Neena Joshi Nassul Kabunga Sonia Zaharia

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Agriculture Nutrition Linkages – Heifer Nepal Experiences

Neena Joshi, Heifer International Nepal

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END HUNGER AND POVERTY WHILE CARING FOR THE EARTH

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FOR MORE THAN

75

YEARS

we have partnered with and helped communities.

WE WORK IN

21

COUNTRIES

to attain sustainable livelihoods through community-owned interventions.

WE'VE PROVIDED

35+

MILLION

families the tools and training to lift themselves from poverty.

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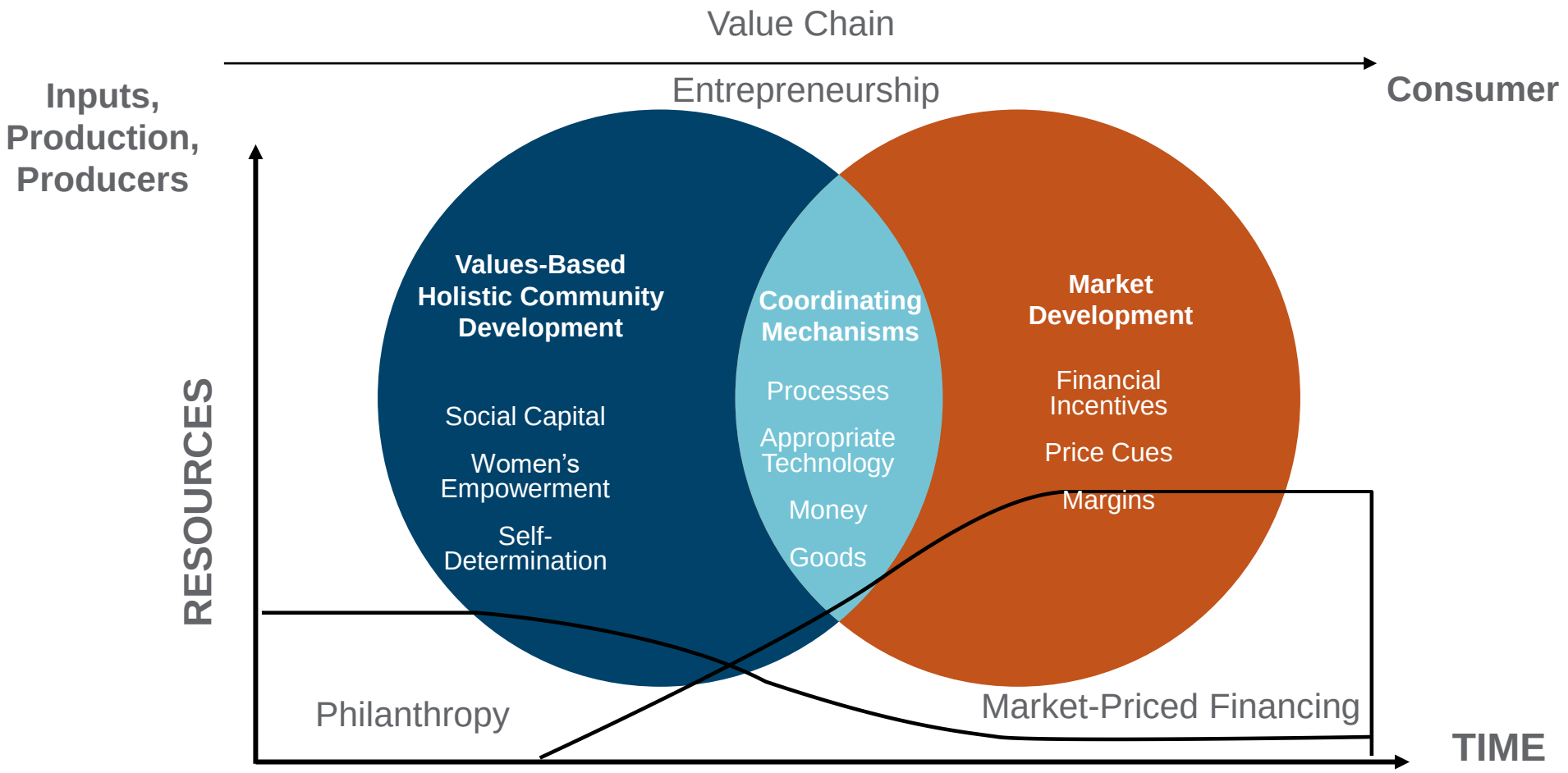

Value Chain
Inputs, Production, Producers
Entrepreneurship
Consumer
RESOURCES
Values-Based Holistic Community Development
Social Capital
Women's Empowerment
Self-Determination
Coordinating Mechanisms
Processes
Appropriate Technology
Money
Goods
Market Development
Financial Incentives
Price Cues
Margins
Philanthropy
Market-Priced Financing
TIME

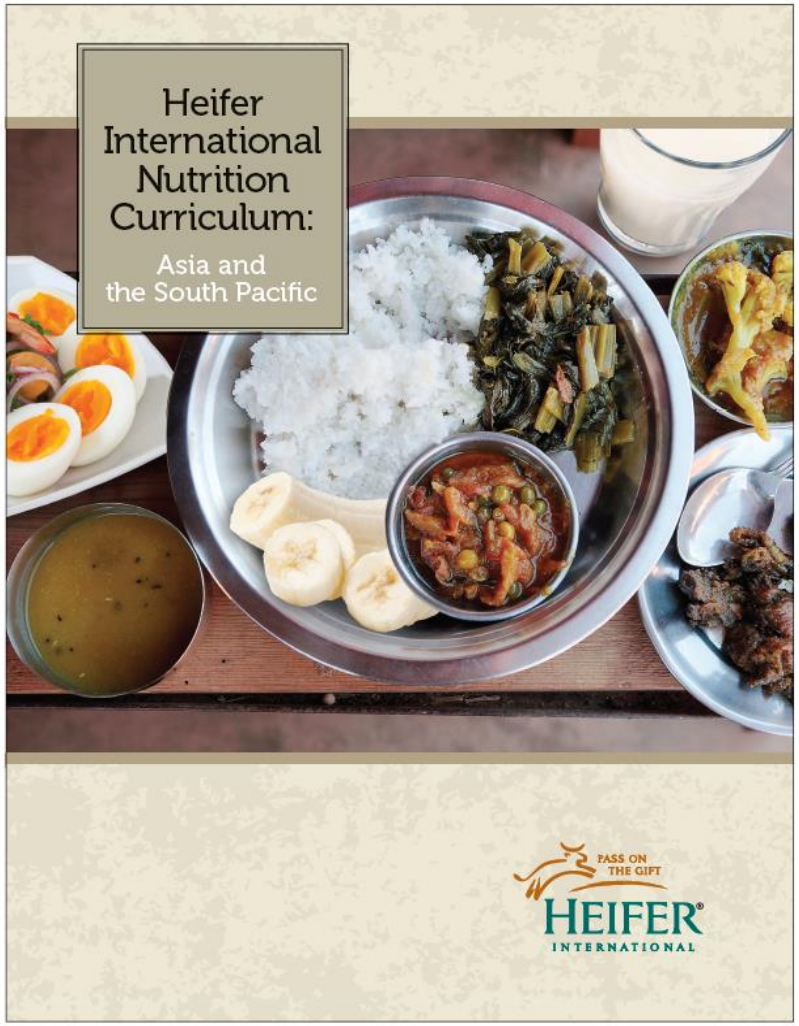
- What happens to child growth and diet in a multisectoral program that doesn't have nutrition as a core component ?

- What part of the Heifer program is most important to child outcomes? Is it the training and livestock donation? Or the community development?

Developed Nutritional Ciriculum

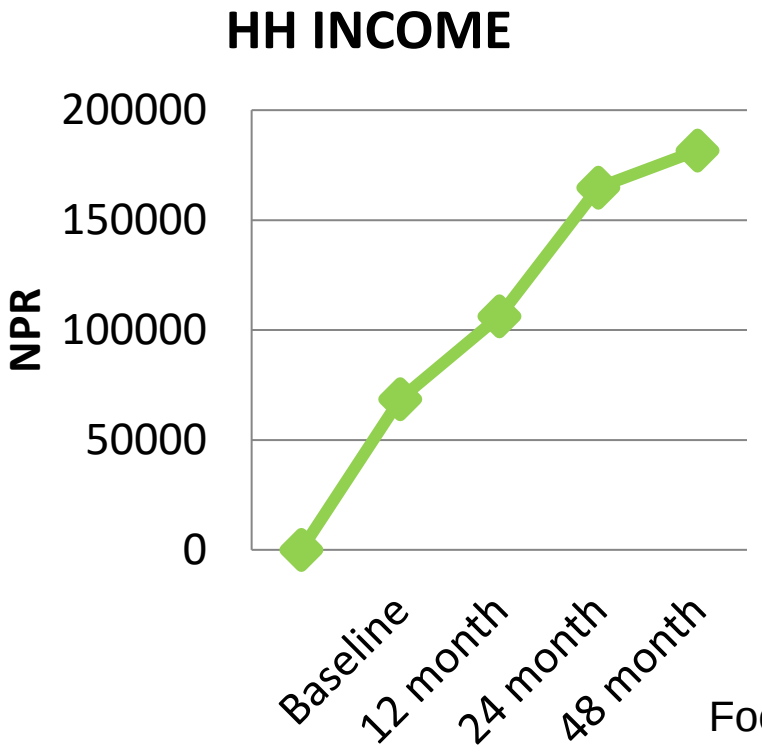
Behaviour change tools

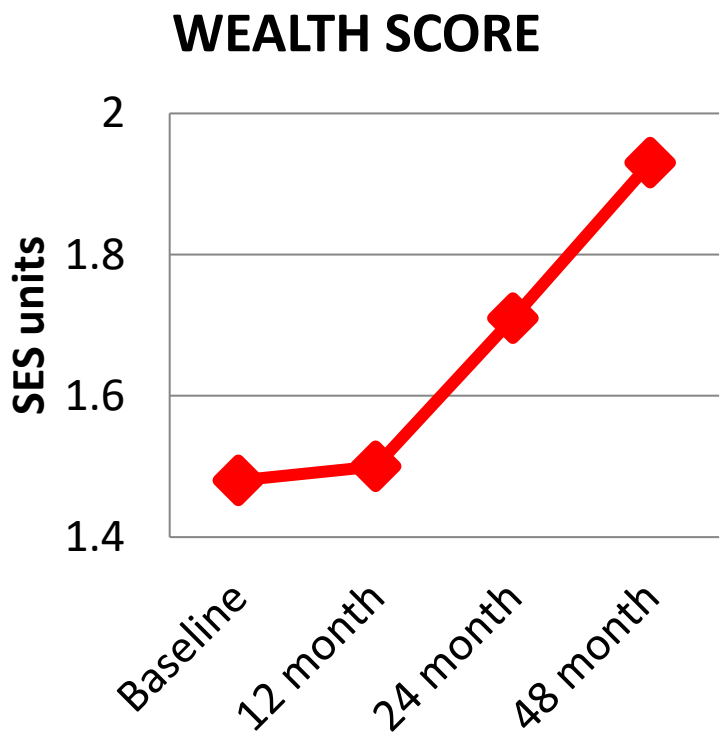
Added nutrition related indicators



The intervention works…

household income and wealth

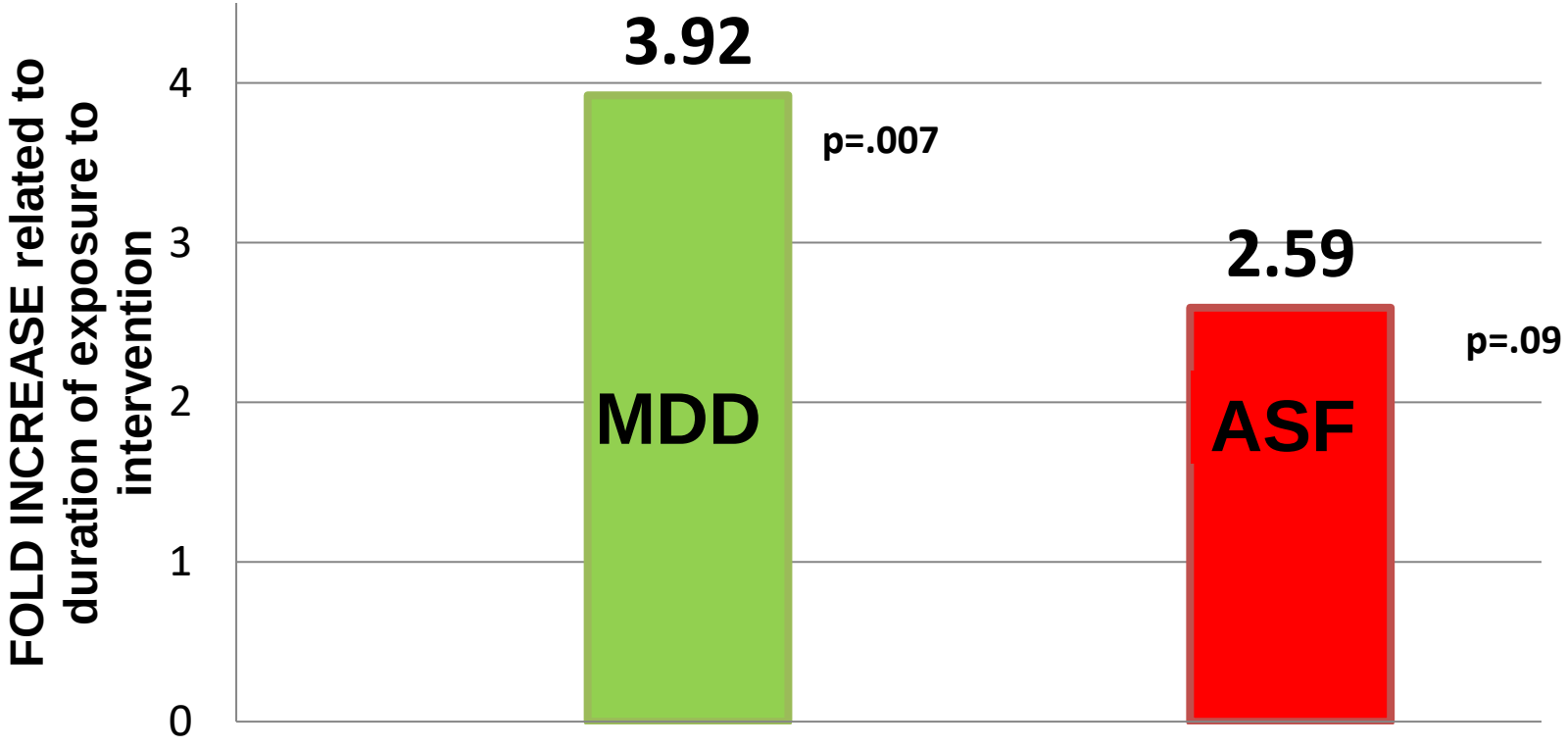




Food Nutr Bull 2014 35:312

The intervention works…

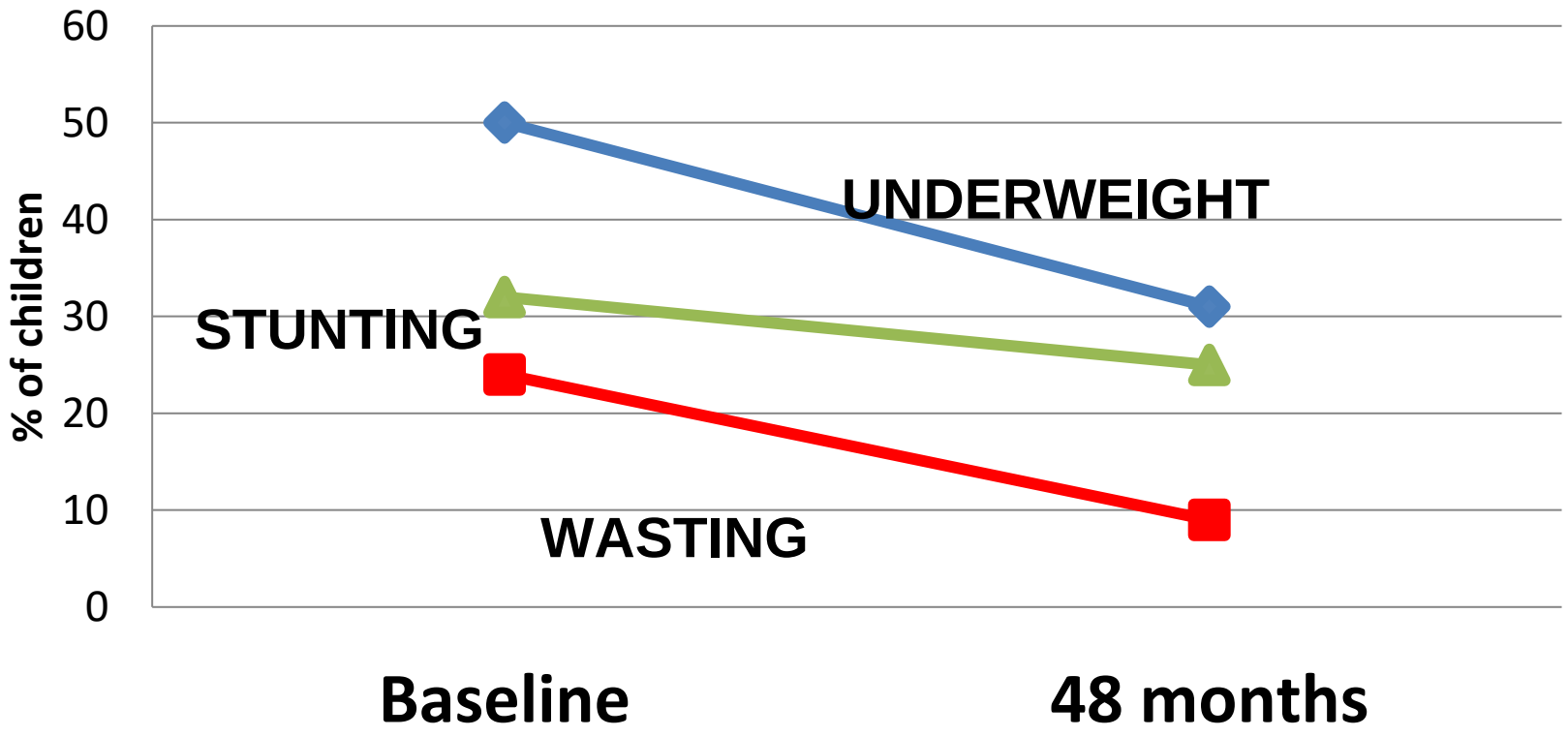
child minimal dietary diversity and ASF consumption



Food Policy 61 (2016) 185–197

The intervention works…

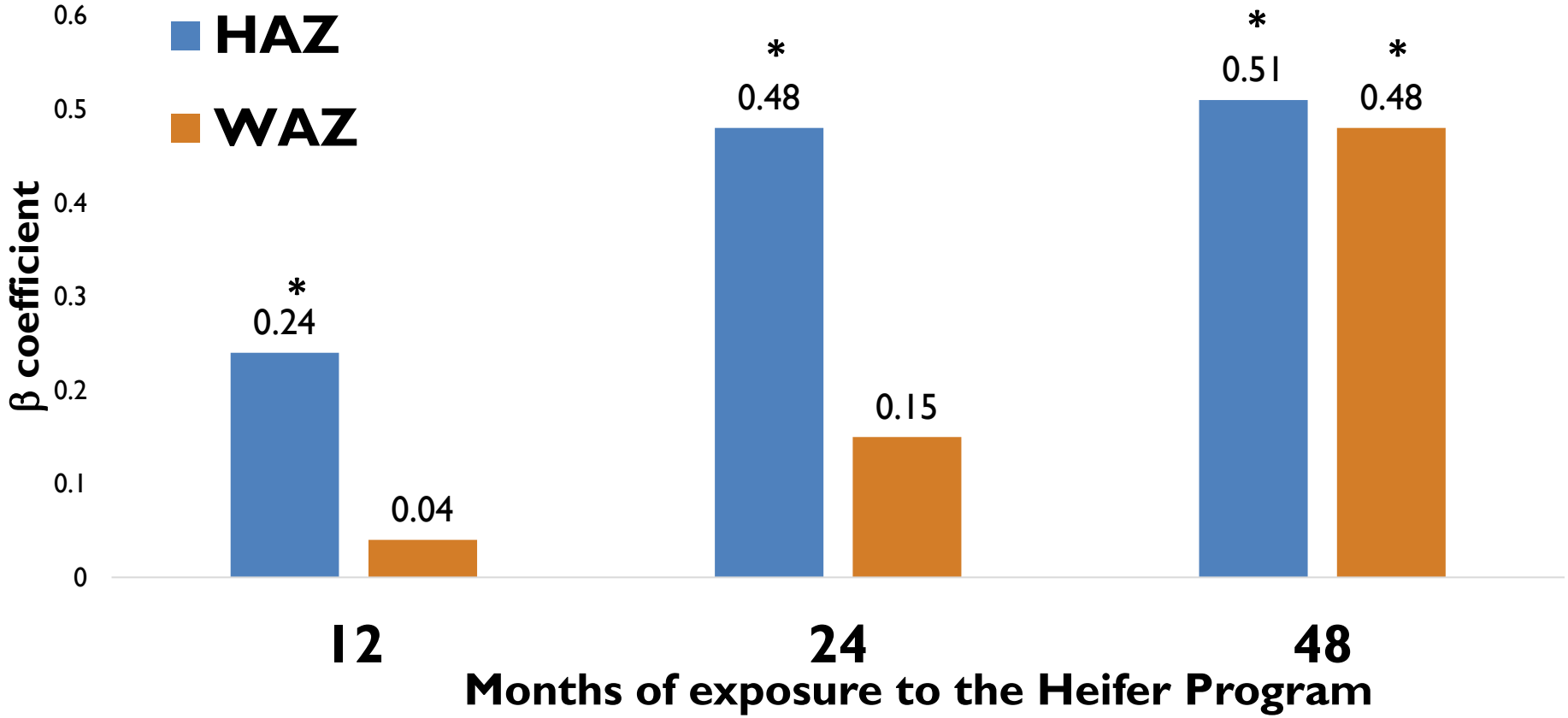
decrease in undernutrition



all p<.0001

J Devel Effectiveness, 2017, 9:101

Impact of intervention on growth takes time

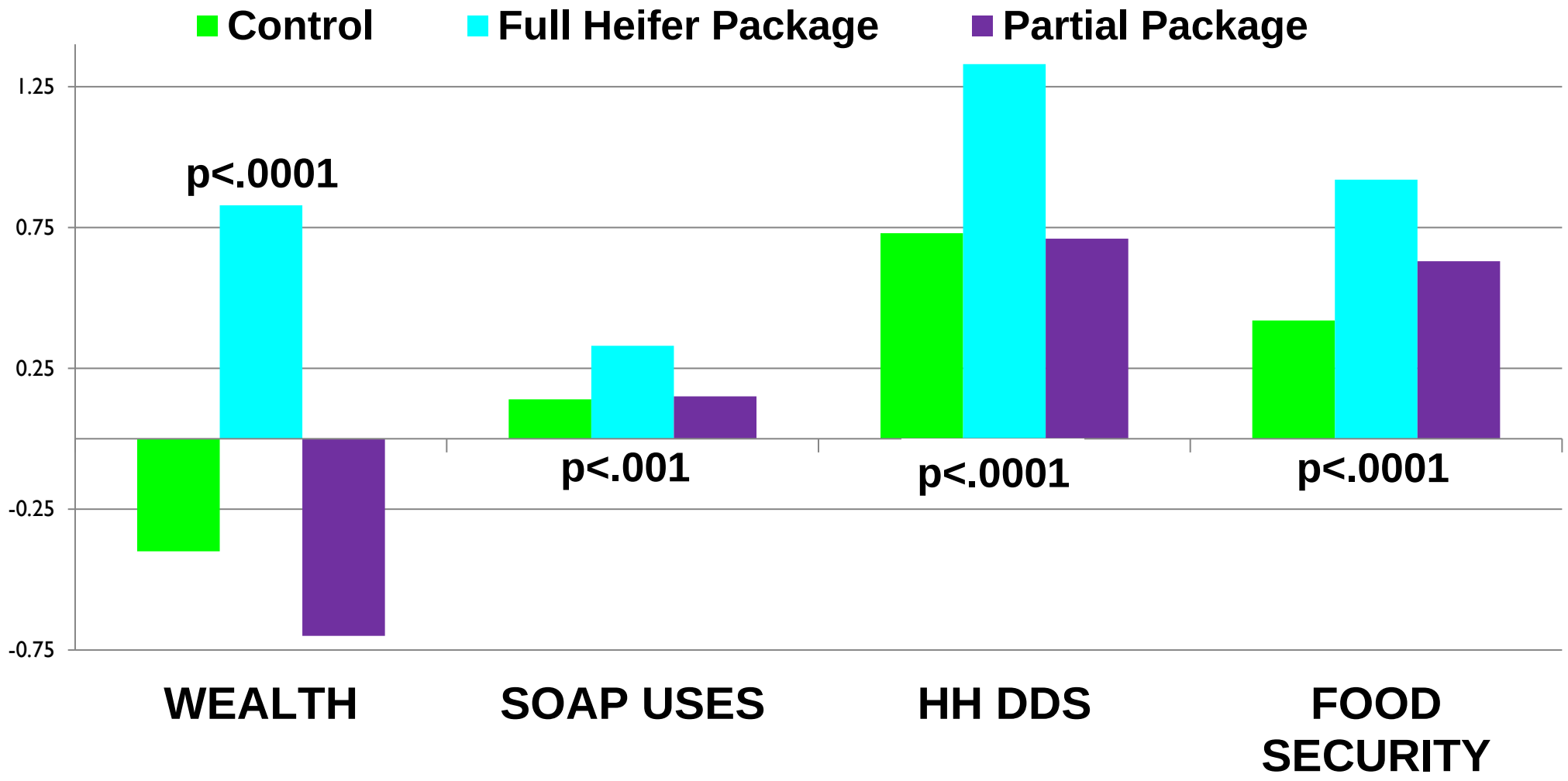


J Devel Effectiveness, 2017, 9:101

Adjusted for gender, age, Terai, baseline HH status [land and animal ownership, SES, income, sanitation]

What part of the Heifer program is most important to child outcomes? Is it the training and livestock donation? Or the community development?

HH INDICATORS: Δ baseline to 33 months



Being in the Heifer Full Package predicted better growth outcomes

Being in the Heifer Full Package predicted greater improvement in child diet quality

Being in the Heifer Full Package predicted greater improvement in child health

Partial Package intervention "looked like" Control for most of the variables assessed

Pub Health Nut (2020) 23:146

Nutrition Innovation Lab helped us :

Built partnership with research and extension

Multisectoral interventions including a social capital component were associated with more favorable HH and child outcomes than training alone

Incomplete programs may have unintended, unfavorable consequences

Equippped us with evidences, to better articulate agriculture and nutrition linkages and advocate for multisectoral approach

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Evaluating Large-scale Multisectoral Ag-Nutrition Initiative

Lessons Learned from the USAID Community Connector Program in Uganda

Nassul Kabunga, PhD
Evaluation Research Economist

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WHY WAS THIS EVALUATION IMPORTANT?

- Naturally, there are close linkages between agriculture, nutrition and health.
- Studying/showing evidence of these inter-linkages is key to inform policy and programming, including:
  - addressing issues that are central in improving welfare of vulnerable populations (in terms of poverty, poor diets, child stunting, anemia, etc.)
  - interrogate the “why” (are people poor, malnourished, etc.)
  - examine “what” can change (i.e. innovative interventions, technologies, packaging, etc.)
  - map behaviors being promoted against pathways laid out in the proposed theory of change (ToC)
  - come up with recommendations for the study area with broader implications for similar contexts
  - estimate the “economic/social cost” of the intervention at pilot and the implications for scale-up

WHAT ARE WE DEALING WITH?

- We assessed the impact of the Uganda Community Connector (CC) Program in 15 Ugandan districts
  - specifically, we wanted to establish if selected CC interventions had impacted on intermediary/pathway outcomes as well as maternal and child nutrition and health outcomes

Context of the USAID-funded CC Program

- **Funded:** USAID for 5-years and implemented by FHI360 in collaboration with local governments and CBOs
- **Goal:** To reduce malnutrition among the most vulnerable populations (women of reproductive age and children <5years) in rural areas, using the integrated agriculture-nutrition approaches
- **Point of intervention:** Community (parish) level using existing (and new) social groups, e.g. women groups, farmer groups, youth groups, etc.
- **Choice of interventions**: Based on the gaps identified at the needs assessment exercise conducted prior to actual implementation of customized interventions (ag extension, ag technologies, BCC, financial services, etc.)

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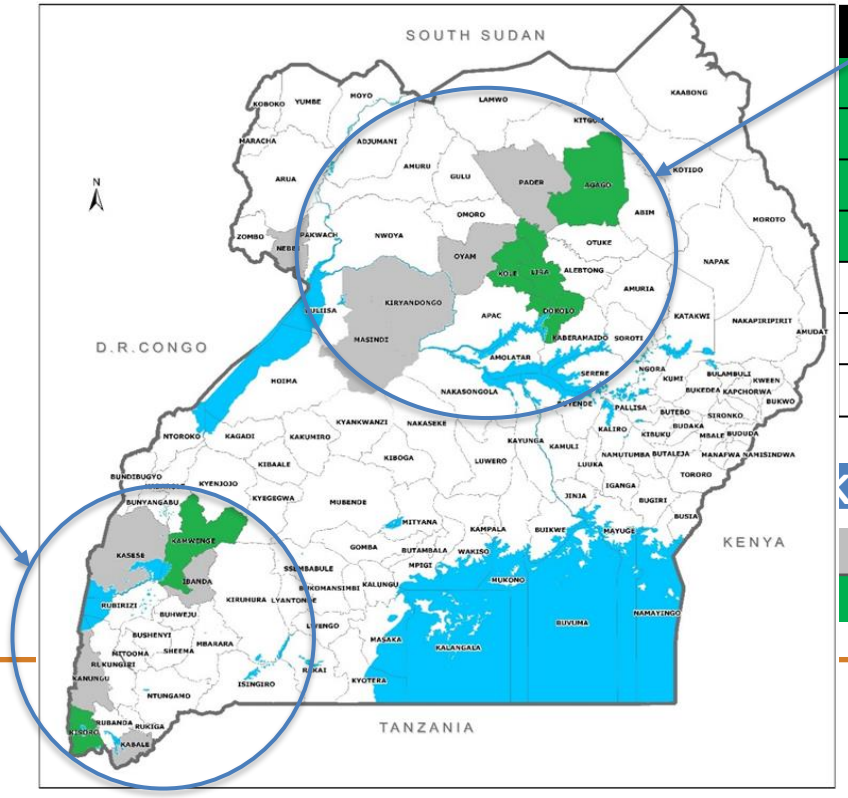
THE CC PROGRAM/ EVALUATION DESIGN

Regional focus: 15 districts in Northern Uganda and South/SW Uganda, with high prevalence rates of poverty and malnutrition in 2012

Map of Uganda

South/S-Western
1. Ibanda
2. Kabale
3. Kamwenge
4. Kanungu
5. Kasese
6. Kiryandongo
7. Kisoro
8. Masindi



Northern
1. Agago
2. Dokolo
3. Kole
4. Lira
5. Nebbi
6. Oyam
7. Pader

Key to Map

- CC intervention districts
- CC districts sampled

Panel Sample:

- Baseline (in 2012): **~3,600** households;
- Follow up (2014): **~3,200** households
- End-line (2016): **~3,200** households
- Over **12,000** children (0-5 years)

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LESSONS LEARNED

Study Findings:

- Overall, based on the results of our analysis, we show that multi-sectoral programs can potentially improve health and nutrition outcomes of vulnerable populations:
  - There were marked improvements in food production diversity leading to some level of improved dietary quality, positive health seeking behaviors and rural financial (credit and saving) services

➔ *Positive changes in intermediary indicators are known to be vital for improved health and nutrition outcomes*

- Unfortunately, there was no convincing evidence of improved maternal and child nutrition outcomes for the choice of CC interventions implemented, save for maternal anemia that reduced by 8% due to CC.

➔ *5 years of implementation may not be sufficient to cause the desired long-term changes in the nutrition outcomes*

- Long-term interventions with much more intensified and wider coverage of intervention packages.
  - ➢ carefully selected agric-WaSH-nutrition package combinations may lead to more impactful results

LESSONS LEARNED

Implementation Challenges:

- Implementing multi-sectoral programs is difficult but doable, requiring multi-sectoral personnel with a broad range of technical knowledge and the willingness to adjust for individuals and systems
- There are 100s of possible interventions –key challenge lies in deciding which behaviors/ technologies to prioritize and how best (the tools) to promote them
  - implementation research could help to track progress against agric-nutrition-health pathways in the ToC
- Attempts to assess impact for multisectoral programs can be quite complex and very challenging.
  - For instance, in this case, not all interventions were implemented true to the original design/plan:
    - some parishes, received a completely different package of interventions than originally planned;
    - some parishes only received partial interventions (initial outreach with little or no follow-up);
    - other parishes within CC intervention sub counties received no interventions at all

LESSONS LEARNED

Current and Future Opportunities:

- Overall, demand for data/info on similar relationships is enormous. **The research gaps are immense.**
- Collectively, our researchers built knowledge around CC programs to explore scaling solutions. But it is really important that study questions are developed together with implementers (including government).
  - *NOT DONE WELL! We could not provide most of the feedback during the CC implementation period but we have many lessons for the future.*
    - Unfortunately, most evaluations come months/years after closure of implementation. Partly due to low capacity analysts amidst a myriad of other things.
- The legacy of written knowledge, telling stories is important for us to invest in the time and money. But also critical is to disseminate knowledge in easily digestible formats (briefs, handouts, presentations)
  - *We took back RESULTS on every study round. And were appreciated by the technical and political wings of local government (district and sub-counties). We generated new insights and initiated new debates!*

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The empirical benefits of longitudinal data in nutrition

Dr. Sonia Zaharia, Friedman School of Nutrition Science and Policy, Tufts University
Feed the Future Innovation Lab for Nutrition

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Nepali Technical Assistance Group NTAG
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How did we use longitudinal data at NIL?

NIL conducted multiple longitudinal studies:

- Panel studies: PoSHAN (Nepal), BAHNR (Bangladesh), Uganda CC
- Birth cohort studies: AflaCohort (Nepal), Uganda Birth Cohort

How did we use the datasets? A few examples:

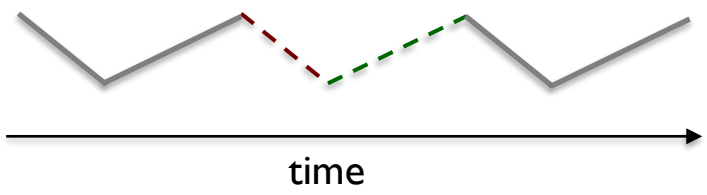
1. Resilience measurement
2. Lagged analyses of food consumption and young child nutrition outcomes

1. Resilience Measurement

Resilience: the ability to "bounce back" after an adverse event.

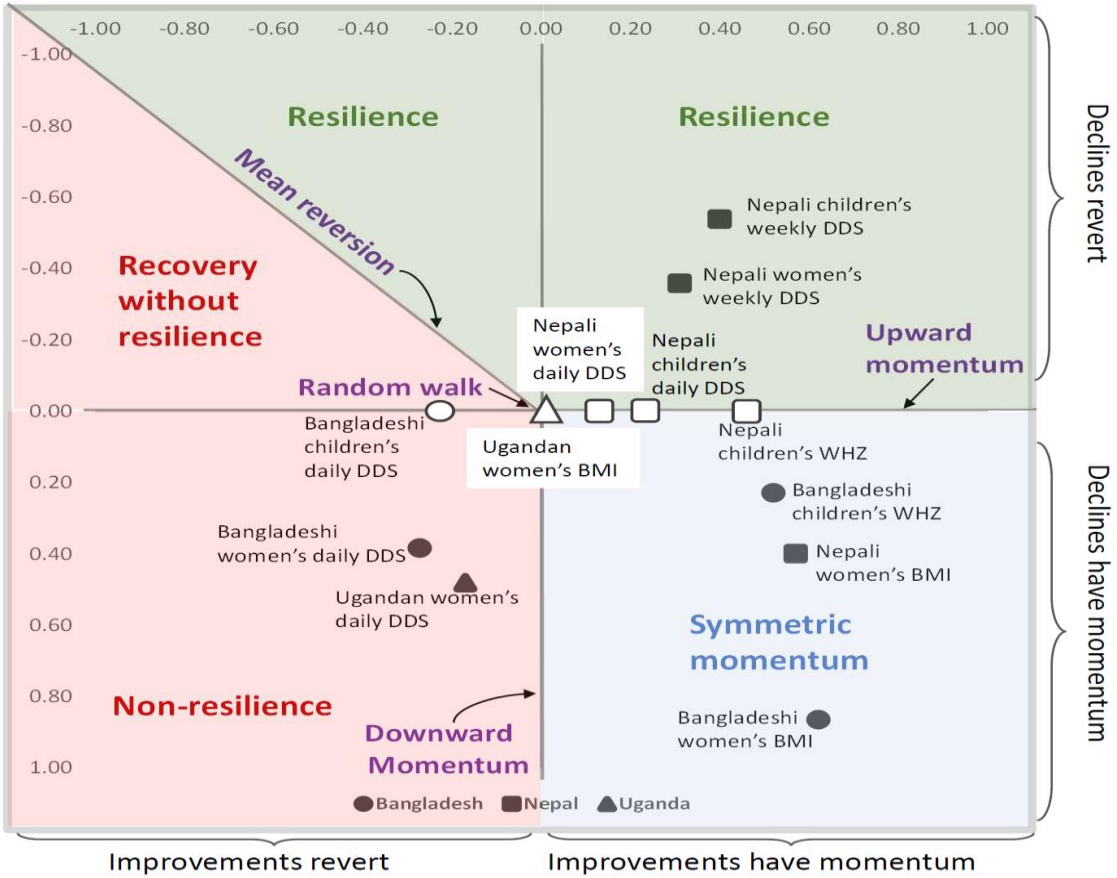
Resilience is concerned with those who experience a decline and then recover at least some of what they lost.

Are they truly resilient, or did they just experience random noise?



At NIL we developed a measure of resilience that distinguishes true recovery from random fluctuations using panel data with ≥3 time points.

Results of pilot tests in Nepal, Bangladesh, and Uganda



Source: S. Zaharia, W.A. Masters, S. Ghosh, G.E. Shively, S. Gurung, S. Manohar, A.L. Thorne-Lyman, K.P. West, K.H. Appel, L. Liang, R. Shrestha, B. Bashaasha, N. Kabunga and P. Webb (2021). **Recovery Without Resilience? A Novel Way to Measure Nutritional Resilience in Nepal, Bangladesh, and Uganda.** Forthcoming in *Global Food Security.*

2. Lagged analyses of food consumption and young child nutrition outcomes

Is there a relationship between diet in early life and later child growth and development?

1. Sustained animal-sourced foods (ASF) consumption & **stunting** (6-24 months)
2. Cumulative ASF consumption, and at different age time points & **cognitive outcomes** (6-24 months)
3. Sustained diet diversity & child **nutrition outcomes** (6-59 months)

Data

- PoSHAN Community Study (Nepal)
- BAHNR Study (Bangaldesh)
- AflaCohort Study (Nepal)

Sustained ASF consumption and stunting of young children in Nepal and Bangladesh

Outcome: % Stunted	Nepal β (SE)		Bangladesh β (SE)	
Consumed ≥2 types of ASF in her daily diet **last year** (Nepal) or **6 months ago** (Bangladesh)	**-0.151*** **	(0.032)	**-0.087*** **	(0.021)
Consumed ≥2 types of ASF in the **past 24h**	-0.047	(0.065)	**-0.066***	(0.033)

Reported estimates are from fixed effects panel regressions adjusted for child's age, gender, illness, breastfeeding status, and consumption of other food groups; mother's height and education; and household sanitation. * p<0.1; ** p<0.05; *** p<0.01. The data used for the analysis are for children aged 6-24 months from the PoSHAN Study in Nepal (N=787) and the BAHNR Study in Bangladesh (N=1381).

Source:
Zaharia, S., Ghosh, S., Shrestha, R., Manohar, S., Thorne-Lyman, A.L., Bashaasha, B., Kabunga, N., Gurung, S., Namirembe, G., Appel, K.H., Liang, L., and Webb, P. 2021. **Sustained intake of animal-sourced foods is associated with less stunting in young children.** *Nature Food 2(4)*, 246-254.

Cumulative ASF consumption and cognitive development of young children in Banke, Nepal

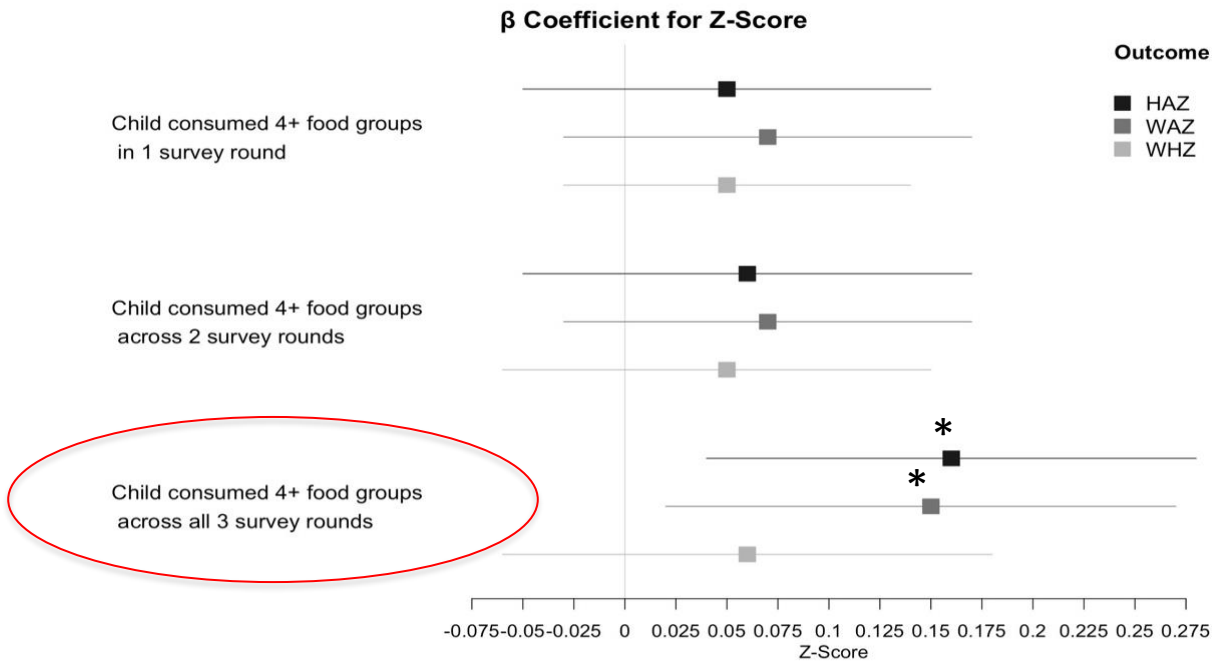
Outcome: ASQ Score at 24-26 months	β	(SE)
Cumulative ASF Consumption (6-22 months)		
Daily # ASFs	3.457***	(0.701)
Weekly # ASFs	1.939***	(0.335)

Reported estimates are from multivariate OLS adjusted for clustering, household wealth, mother's education, child's age and gender, and consumption of other food groups.

*p<0.05; ** p<0.01; *** p<0.001. The data used for the analysis are from the AflaCohort Study (N=702).

Source: Pokharel, A. et al. 2021. **The relationship between early life animal sourced food consumption and childhood development outcomes among children in Banke, Nepal**. Feed the Future Innovation Lab for Nutrition Working Paper.

Sustained dietary diversity and child nutrition outcomes in Bangladesh



Coefficients are estimated using mixed effects linear regressions. Models are adjusted for age, sex, wealth quintile, maternal education and height, and survey round. The data used for the analysis are for children aged 6-59 months from the BAHNR Study in Bangladesh (N=2697). *p< 0.05.

Source: Thompson, L. et al. 2021. **Farming Fruit and Fish: Is there Value-Added for Nutrition of Combining Horticulture and Aquaculture in Bangladesh?**. Feed the Future Innovation Lab for Nutrition Working Paper. In review.

Implications for programming

Longitudinal studies are costly…
…But very valuable because:

- We can compare changes over time in outcomes of interest (recovery, resilience)
- We can study associations over time (diet and health outcomes)
- We can control for unobservable characteristics (models with fixed and random effects)

Acknowledgements

- The research is funded under grant contracts AID-OAA-L-10-00006 and AID-OAA-LA-14-00012 from the United States Agency for International Development (USAID).
- POSHAN community studies – Nepal:
  - Led by Johns Hopkins University with in-country partners; National Agriculture Research Council (NARC), Nepal Technical Assistance Group (NTAG), New Era, Tribhuvan University Institute of Medicine (TUTH IOM), Tufts University.
- BAHNR study – Bangladesh:
  - Tufts University, HKI Bangladesh, Horticulture Innovation Lab, WorldFish, AquaFish Innovation Lab, Dhaka University, Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING).
- Uganda panel survey – Uganda:
  - Makerere University School of Public Health, Uganda; the Uganda Science and Technology Council, Kampala, Uganda.

Q&A

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