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**IMPACT OF HOMESTEAD FOOD PRODUCTION ON NUTRITIONAL STATUS OF CHILDREN AND WOMEN IN BAITADI DISTRICT, NEPAL**



Akoto K. Osei, 2013



**ACTION AGAINST MALNUTRITION THROUGH AGRICULTURE (AAMA) PROJECT**



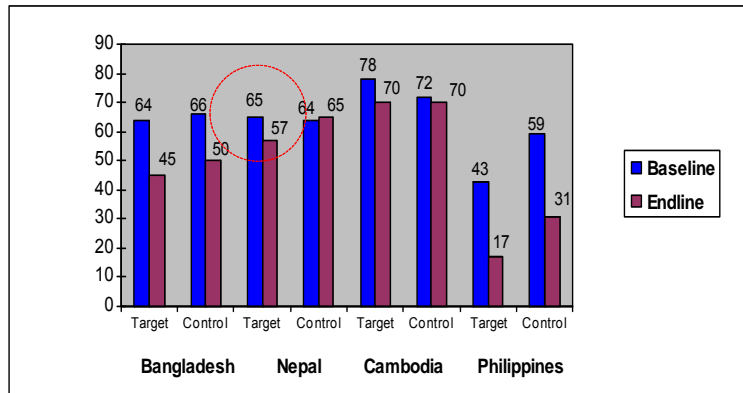
- Today's focus is on research conducted in Baitadi district as part of the "Action Against Hunger through Agriculture (AAMA) project"
- AAMA was one of HKI's Enhanced Homestead Food Production (EHFP) programs
- 4 year project funded by USAID (2008-2012)
- Targeted children <2 years and pregnant and lactating women
- Combined home garden and poultry raising, with behavior change communication (BCC) strategies to promote Essential Nutrition Actions (ENA)
- Implemented through the local health and agriculture systems

## WHY THE RESEARCH IN BAITADI DISTRICT WAS CONDUCTED



- As of 2008, there were demonstrated impact of EHFP on:
  - Improved agricultural practices
  - Volume and diversity of vegetables and fruits produced
  - Diversity of foods consumed
  - Women’s involvement in household decision making
  - Potential reduction of anemia among children and women
- No impact on child anthropometry (stunting, wasting and underweight)
- No impact on anthropometry of women (BMI)
- No impact on overall household income, although some positive impact on income from sale of EHFP products

## ANEMIA AMONG CHILDREN AGED 6-59 MONTHS FROM HFP PROGRAM AND CONTROL HOUSEHOLDS (2003-2006).



## OTHER REVIEW ARTICLES REACHED SIMILAR CONCLUSIONS AND PROVIDED THE FOLLOWING REASONS FOR LACK OF IMPACT OF EHFP ON NUTRITIONAL STATUS



- Very few evaluations on impact of EHFP intervention on anthropometry of children and women
- Scarce data on impact of EHFP on other micronutrient indicators aside anemia
- Limited data on impact of EHFP on overall household income
- EHFP evaluation designs were not rigorous enough
- Lack of emphasis on program impact pathways

*Masset et al 2012*

## RESEARCH OBJECTIVES OF AAMA

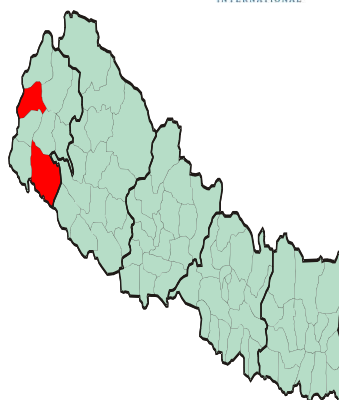


### Baitadi district:

- Community trial to address the long-standing challenge: can EHFP improve nutritional status of children and women
  - Reduce stunting, wasting, underweight and anemia in children
  - Reduce underweight and anemia in women

### Kailali district:

- Roll-out EHFP throughout the district to identify factors necessary for potential “scale up”



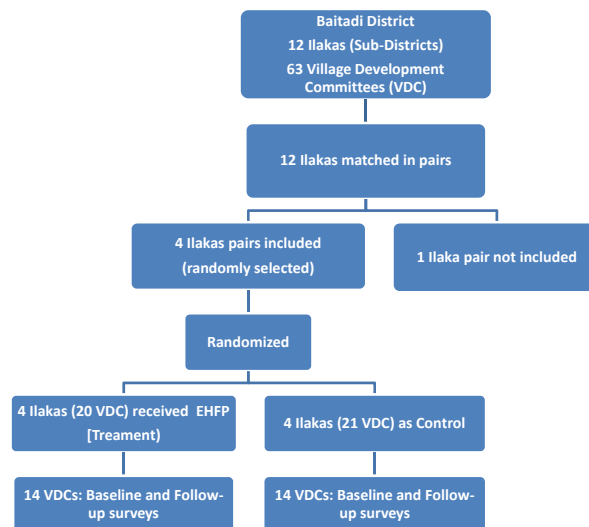
**Baitadi and Kailali Districts**

## RESEARCH DESIGN



- Cluster randomized controlled design
- Pre and post surveys with independent samples (“cross sectional”) – Baseline August, 2009 – Follow-up August, 2012

## RANDOMIZATION OF COMMUNITIES TO EHFP (TREATMENT) AND CONTROL



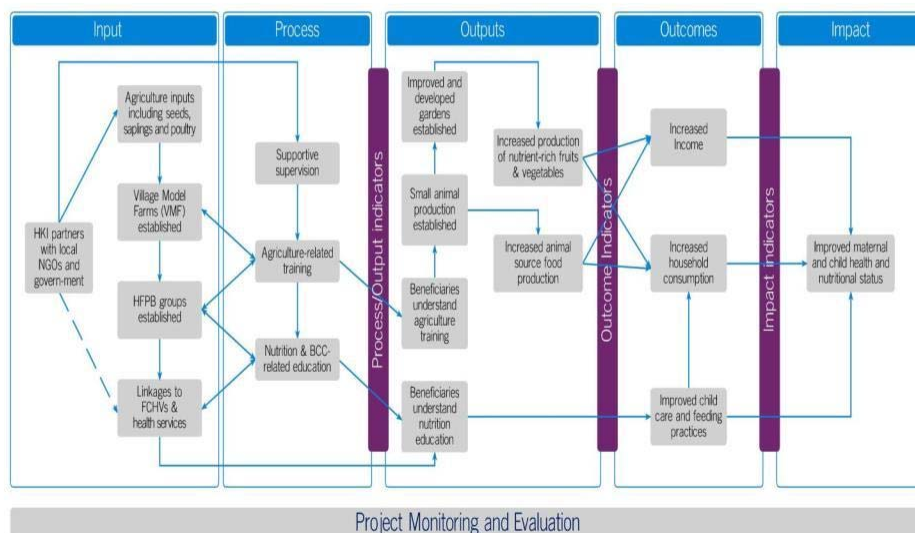
## ROLE-OUT OF EHFP INTERVENTION IN "TREATMENT" COMMUNITIES



- EHFP was implemented in 6 of ~9 wards (villages) per target VDC
- Each ward had:
  - 1 Village Model Farm (VMF), managed by a woman
  - ~ 30 households with children < 2 years who benefited from the EHFP inputs (home garden, poultry and nutrition education)
  - Beneficiary mothers were organized into 'mothers groups' (~15 - 20 mothers per group)
- Female Community Health Volunteers (FCHVs) were given priority to be a VMF
- Cascade Training led by CHD, HKI, NTAG, NNSWA, DADO & DLSO:
  - Training of Trainers who then trained FCHVs, VMF and household beneficiaries

## AAMA PROGRAM PATHWAYS FRAMEWORK

HKI, NTAG, NNSWA, DHQ, DADO, DOLS



## FAMILIES WHO PARTICIPATED IN BASELINE AND FOLLOW UP SURVEYS



Each survey examined families with children children 12-48 months

**Baseline Survey:**

- 2106 families (treatment =1055; control=1051)

**Follow-up :**

- 2614 families (treatment=1307; control=1307)

- **Qualitative interviews at baseline**
  - 10 FGDs, 5-8 mothers of per FGD
  - 5 IDIs with grandmothers
  - 5 IDIs with fathers

## DATA COLLECTED



- **Quantitative Survey**
  - Interviews
  - Height and weight of mothers and children
  - Hemoglobin concentration of mothers and children
- **Qualitative Research**
  - To inform Behavior Change Communication strategy of AAMA
  - Focus Group Discussions (FGD) with mothers
  - In-depth interviews (IDI) with grandmothers and fathers

## MONITORING



- **Process Evaluation in Treatment communities**
  - Based on Program Impact Pathways (PIPS)
  - Monthly household visits
  - 4 Rounds monitoring data collection by Lot Quality Assurance Sampling (LQAS) Technique
    - (Aug 2010; April 2011; Aug 2011; Mar 2012)
- **Midterm Evaluation Sept 2010 (Only qualitative data collection)**



Photo © HKI/ Bartay

## SECTION 4: RESULTS



## COVERAGE OF EHFP INTERVENTION IN TREATMENT COMMUNITIES



- EHFP were implemented in 20 VDCs and 120 wards
- 122 VMFs were established
  - ~ 30 % of the VMFs were owned by FCHVs
- 3329 Households with children < 2 years benefited from inputs and trainings for home gardens, poultry and nutrition education

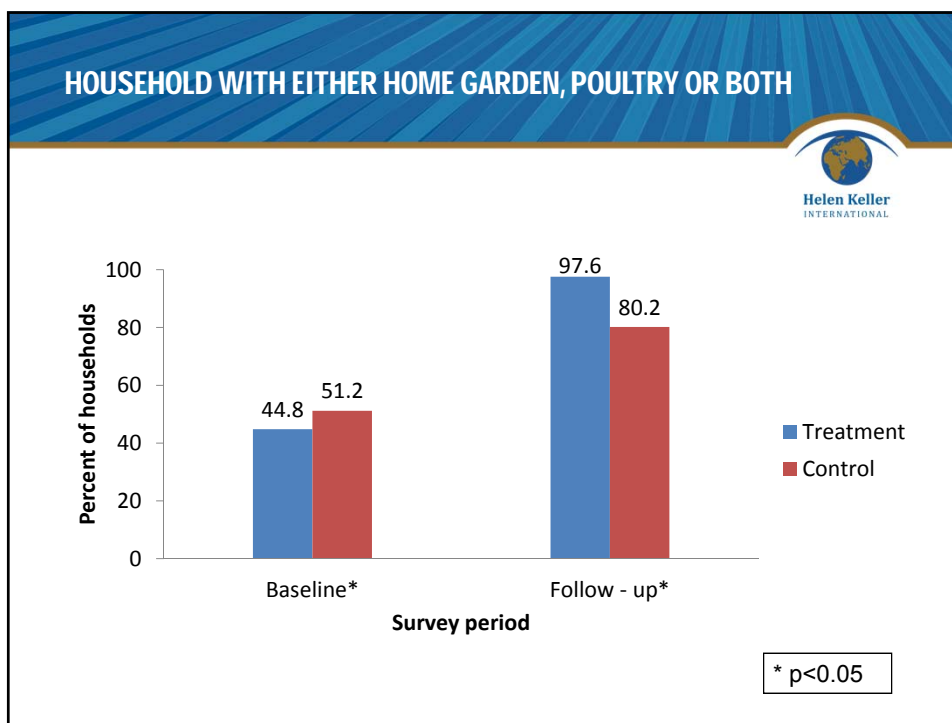
## RESULTS FROM BASELINE AND FOLLOW-UP SURVEYS



### Characteristics of Households in sample

	Baseline			Follow up		
	Treatment	Control	<i>P</i> value	Treatment	Control	<i>P</i> value
Upper Caste, %	77.4	82.3	0.004	70.2	78.1	0.000
Household size	7.2 (4.0)	6.0 (3.0)	0.000	6.0 (3.0)	6.0 (3.0)	0.569
Male head, %	87.0	93.3	0.000	93.8	95.9	0.017
Wealth tercile, %						
Lower	25.5	42.2	0.000	25.2	41.2	0.000
Middle	28.2	36.7	0.000	32.0	34.6	0.158
Upper	46.3	21.1	0.000	42.8	24.2	0.000






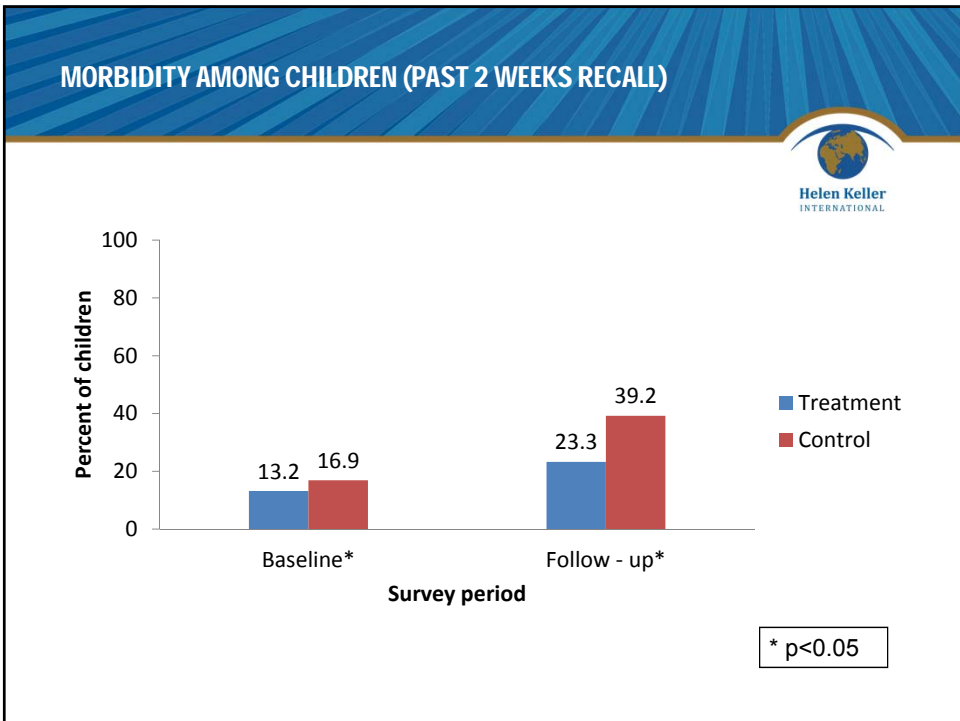
### HOUSEHOLDS WITH SPECIFIC TYPES OF EHFP ACTIVITY

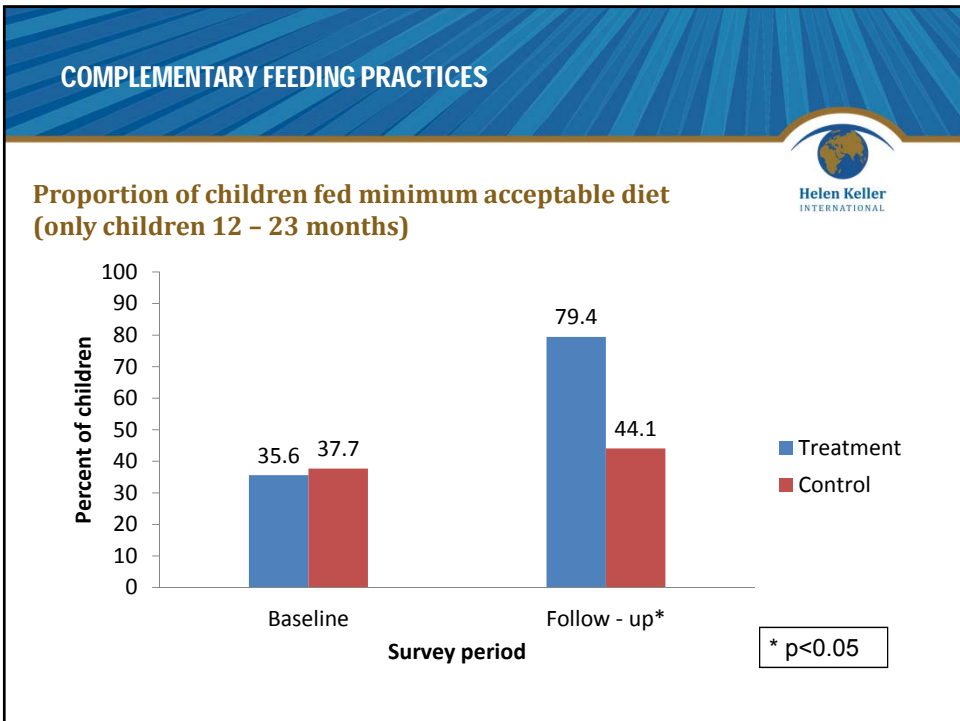
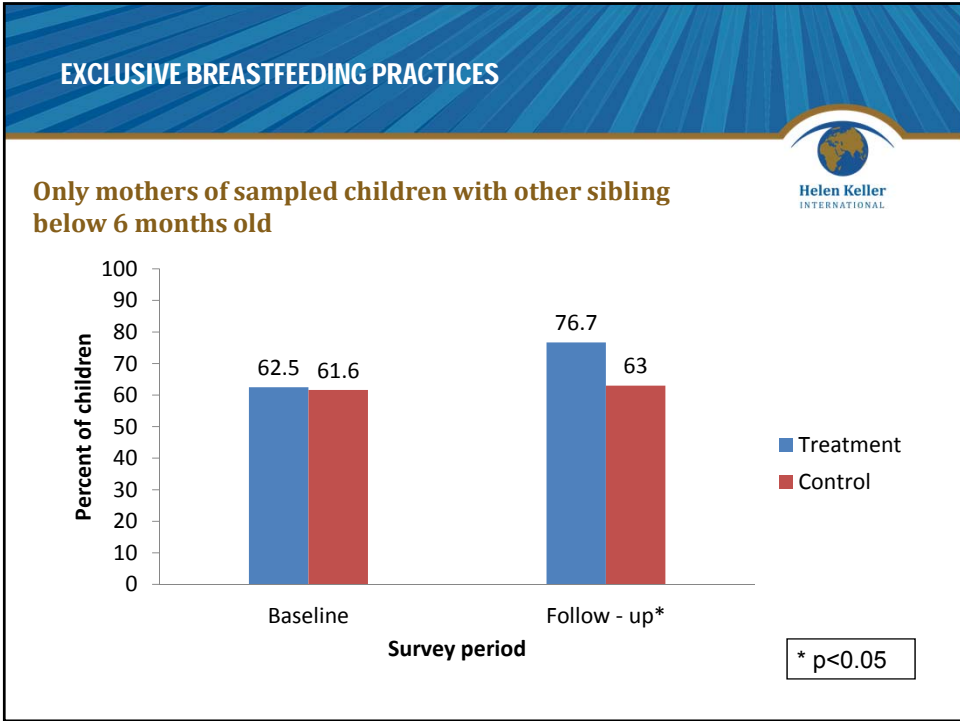
		Treatment (T) %	Control (C) %	Difference (T - C)	P value
<b>Garden only</b>	Baseline	73.4	71.4	2.0	0.425
	Follow up	69.8	79.2	- 9.4	0.000
<b>Poultry only</b>	Baseline	15.9	18.0	- 2.1	0.328
	Follow up	1.1	4.2	- 3.1	0.000
<b>Garden + Poultry</b>	Baseline	10.8	10.6	0.2	0.919
	Follow up	29.1	16.6	12.5	0.000

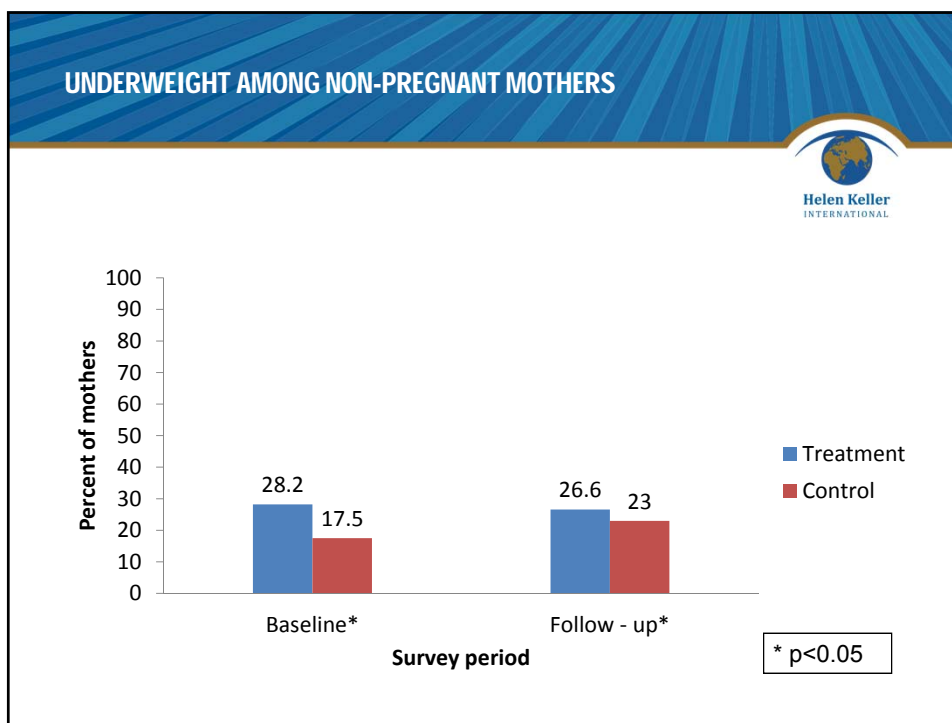
### FOOD INSECURITY AMONG HOUSEHOLDS



		Treatment (T) %	Control (C) %	Difference (T-C)	P value
<b>Food insecure, %</b>					
<b>Total</b>	<b>Baseline</b>	<b>79.7</b>	<b>87.4</b>	<b>- 7.7</b>	<b>0.000</b>
	<b>Follow up</b>	<b>53.6</b>	<b>78.3</b>	<b>- 24.7</b>	<b>0.000</b>
<b>Mild</b>					
	<b>Baseline</b>	<b>21.7</b>	<b>19.9</b>	<b>1.8</b>	<b>0.298</b>
	<b>Follow up</b>	<b>17.4</b>	<b>14.5</b>	<b>2.9</b>	<b>0.041</b>
<b>Moderate</b>					
	<b>Baseline</b>	<b>8.8</b>	<b>15.4</b>	<b>- 6.6</b>	<b>0.000</b>
	<b>Follow up</b>	<b>23.3</b>	<b>35.8</b>	<b>- 12.5</b>	<b>0.000</b>
<b>Severe</b>					
	<b>Baseline</b>	<b>49.2</b>	<b>52.2</b>	<b>- 3.0</b>	<b>0.160</b>
	<b>Follow up</b>	<b>12.9</b>	<b>27.9</b>	<b>- 15.0</b>	<b>0.000</b>





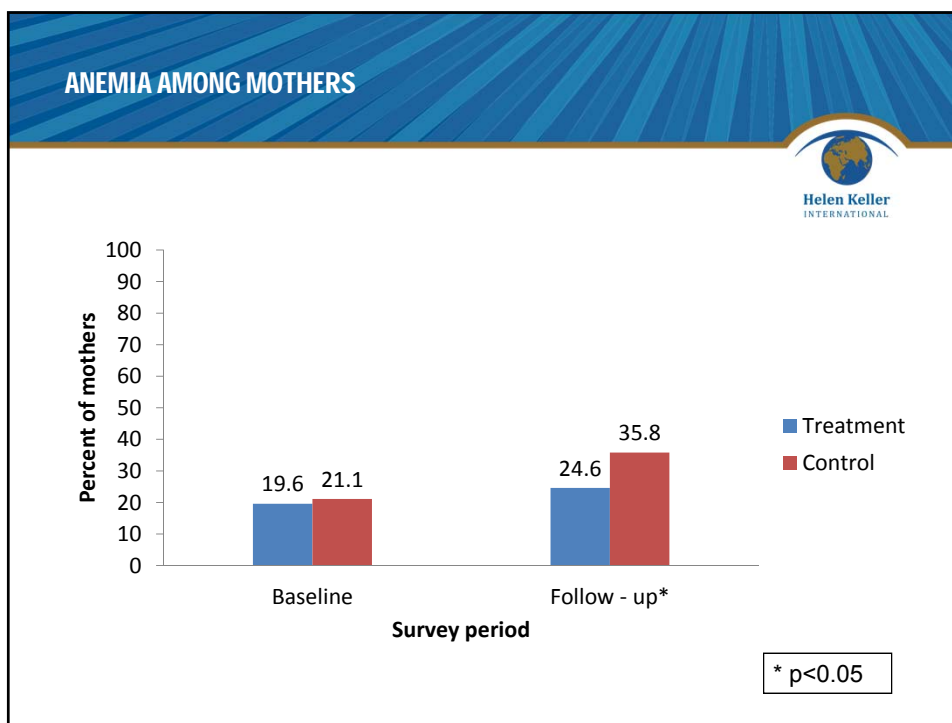


### HEMOGLOBIN CONCENTRATION OF MOTHERS

		Treatment (T) mean $\pm$ SD	Control (C) mean $\pm$ SD	Difference	P value <sup>†</sup>	P value <sup>‡</sup>
Hemoglobin, g/L	Baseline	132.6 $\pm$ 15.3	133.8 $\pm$ 17.2	- 1.2	0.077	0.028
	Follow up	130.0 $\pm$ 13.7	126.4 $\pm$ 14.4	3.6	0.000	0.000

<sup>†</sup> *Adjusted for only cluster design*

<sup>‡</sup> *Adjusted for cluster design, mother's age and pregnancy status*



### STUNTING, WASTING AND UNDERWEIGHT AMONG CHILDREN

**Helen Keller  
INTERNATIONAL**

	Treatment (T) %	Control (C) %	Difference	P value
<b>Stunting (HAZ &lt; -2)</b>				
Baseline	57.7	65.8	- 8.1	0.000
Follow up	55.1	63.5	- 8.4	0.000
<b>Wasting (WHZ &lt; -2)</b>				
Baseline	10.6	10.1	0.5	0.688
Follow up	10.5	9.7	0.8	0.462
<b>Underweight (WAZ &lt; -2)</b>				
Baseline	43.4	48.0	- 4.6	0.033
Follow up	41.0	40.6	0.4	0.860

## HEMOGLOBIN CONCENTRATION OF CHILDREN

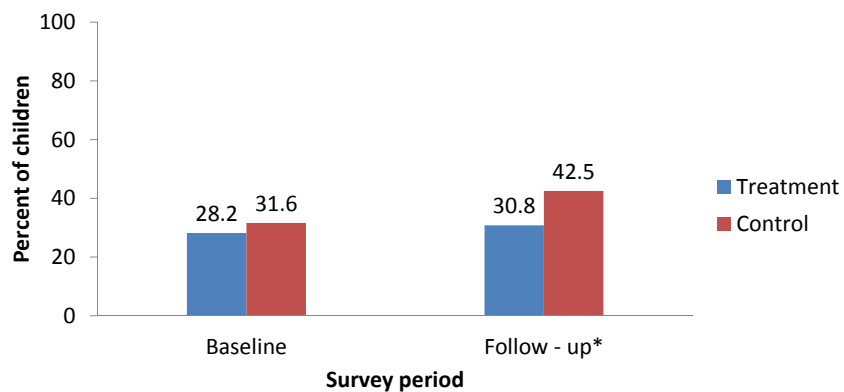


		Treatment (T) mean $\pm$ SD	Control (C) mean $\pm$ SD	Difference (T - C)	P value <sup>†</sup>	P value <sup>‡</sup>
Hemoglobin, g/L	Baseline	118.5 $\pm$ 12.1	118.1 $\pm$ 12.6	0.4	0.446	0.751
	Follow up	117.9 $\pm$ 11.7	115.0 $\pm$ 12.4	2.9	0.000	0.000

<sup>†</sup> Adjusted for only cluster design

<sup>‡</sup> Adjusted for cluster design, child's age and sex

## ANEMIA AMONG CHILDREN



\*  $p < 0.05$

## Multivariate Logistic regression analysis



### • IMPACT: Child Nutritional Status

Adjusted Odds Ratios (95% CI)

	Binary outcome variable			
	Stunting	Wasting	Underweight	Child anemia
Treatment X TIME	0.93 (0.73 – 1.18)	0.99 (0.68 – 1.45)	1.13 (0.89 – 1.43)	0.77 (0.60 – 1.00) <sup>#</sup>

### • IMPACT: Maternal Nutritional Status

Adjusted Odds Ratios (95% CI)

	Binary outcome variable	
	Maternal underweight	Maternal anemia
Treatment X Time	0.63 (0.47 – 0.84)*	0.59 (0.45 – 0.76)*

#p=0.051

\*p<0.05

## SUB-STUDY WITHIN AAMA : EHFP + MNP VERSUS EHFP ALONE VERSUS CONTROL



		N	Baseline % (B)	Follow up % (F)	Difference (F - B)	P value
Anemia	EHFP + MNP	99	71.7	20.2	- 51.5	0.000
	EHFP	100	64.4	15.8	- 48.6	0.000
	Control	106	65.1	25.5	- 39.6	0.000



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## SUMMARY OF FINDINGS



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- **Results shows that Enhance Homestead Food Production program has potential of reducing anemia among children and women in Nepal**
- **The findings also demonstrate that EHFP has potential of reducing underweight among women**
- **There was no demonstrated impact on child growth**
  - **Probably because families were exposed to the intervention for only 2.5 years**
- **However, there was significant improvements in a range of maternal practices that are known to impact child growth**



## SOME LESSONS LEARNED




- **Strong partnership between government ministries and other implementing agencies was beneficial in rolling-out of the AAMA intervention**
- **Emphasis on program impact pathways facilitated proper monitoring of the intervention activities**
- **Formative research at baseline allowed us to identify specific messages (“small doable actions”) to promote in the district**
- **Short funding cycle (4 years) and lengthy project start up process limited exposure of families to the intervention**
- **Multi-sectoral planning and implementation appeared easier at the district and ward levels than at national level**

## THANKS TO



- **Government of Nepal**
- **USAID**
- **NTAG**
- **SMJK**
- **MI**
- **Alive & Thrive**
- **UC DAVIS**
- **HKI**



**THANK YOU.**

**“Although the world is full of suffering, it is also full of the overcoming of it.”**  
-Helen Keller



**Helen Keller**  
INTERNATIONAL