Adding ENAM to the intervention pot to improve young children's diets in rural Ghana

Grace S Marquis
School of Dietetics & Human Nutrition/CINE

U of Ghana Co-PIs

Anna Lartey

Ben Ahunu

Emmanuel Canacoo

Owuraku Sakyi-Dawson
Ghana PI

Grace Marquis
US PI

Iowa State U Co-PIs

Lorna Butler

Manju Reddy

Helen Jensen

Elizabeth Lonergan

Esi Colecraft
Project manager

Richard Tweneboah-Kodua, Aaron Christian
Field supervisors / data management

Selasie Agamah, Gymfiwah Nikoi
Administrative officer

Mawunyo Timbo, Gifty Nyarko
Data entry

24 sponsored students
(Ghana, USA, Canada)

Felix Boadu
Driver

William Quarmine, Clifford Marquaye
Data analysis assistants

Temporary region-based data collection team

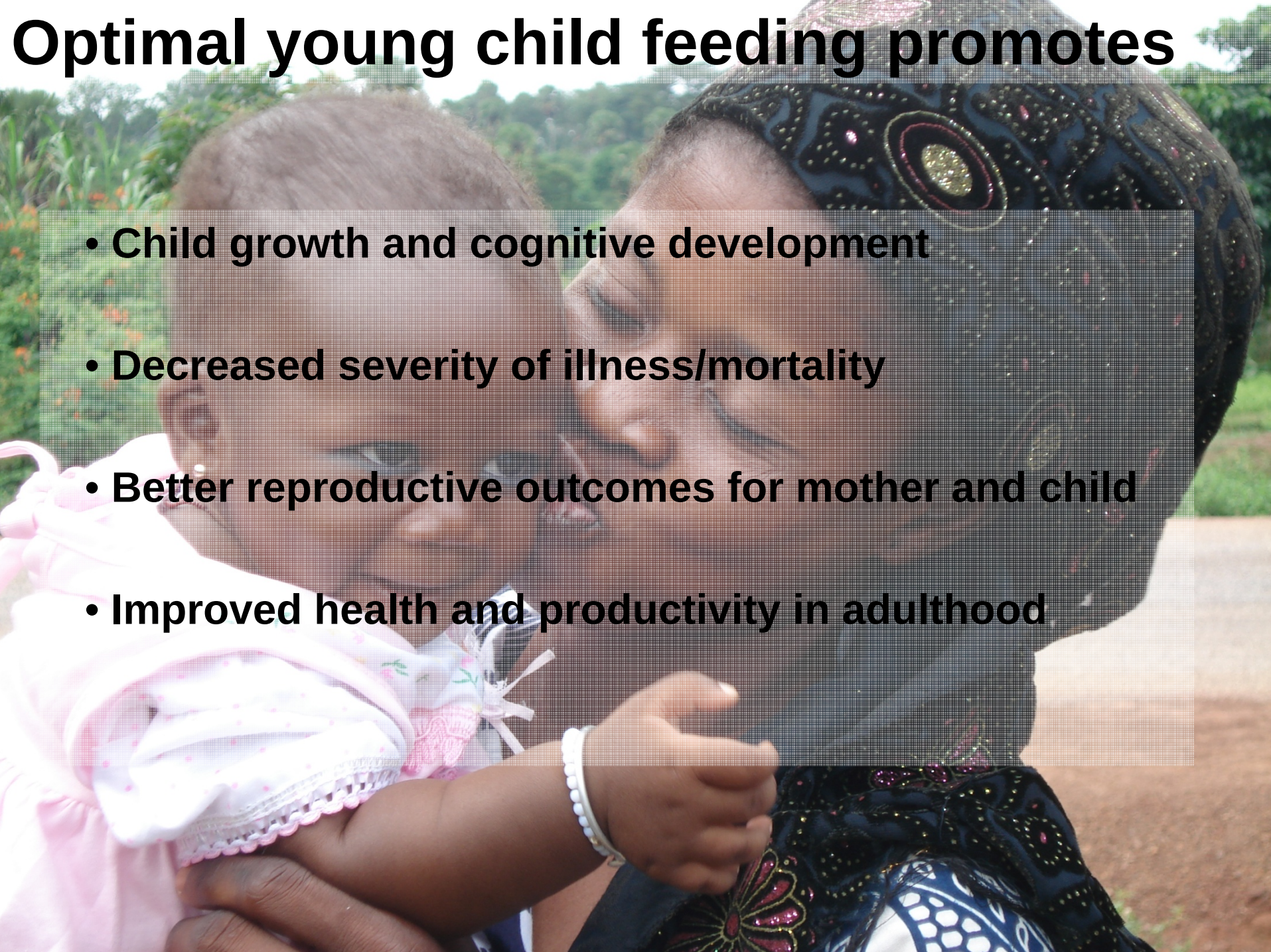
Felicia Kudomor
Winneba

Dinah Amoah
Techiman

Thomas Kambonga
Navrongo

Regional managers

Optimal young child feeding promotes



- Child growth and cognitive development
- Decreased severity of illness/mortality
- Better reproductive outcomes for mother and child
- Improved health and productivity in adulthood

CRSP work leading up to ENAM

Nutrition CRSP (1980's)

- **Observational study in Kenya, Egypt, Mexico**
- **Animal source foods (ASF) predicted physical growth, cognitive function, school performance, physical activity**

Global Livestock CRSP (1990's)

- **Randomized controlled trial in Kenya**
- **Meat group showed increases in indicators of physical growth, cognitive function and school performance, and physical activity**

ENAM Project

Enhancing child **N**utrition through **A**nimal source food **M**anagement

Enam = “animal-based products” (Twi)

Phase 1

"What are the constraints on ASF?"

Interviews & focus groups

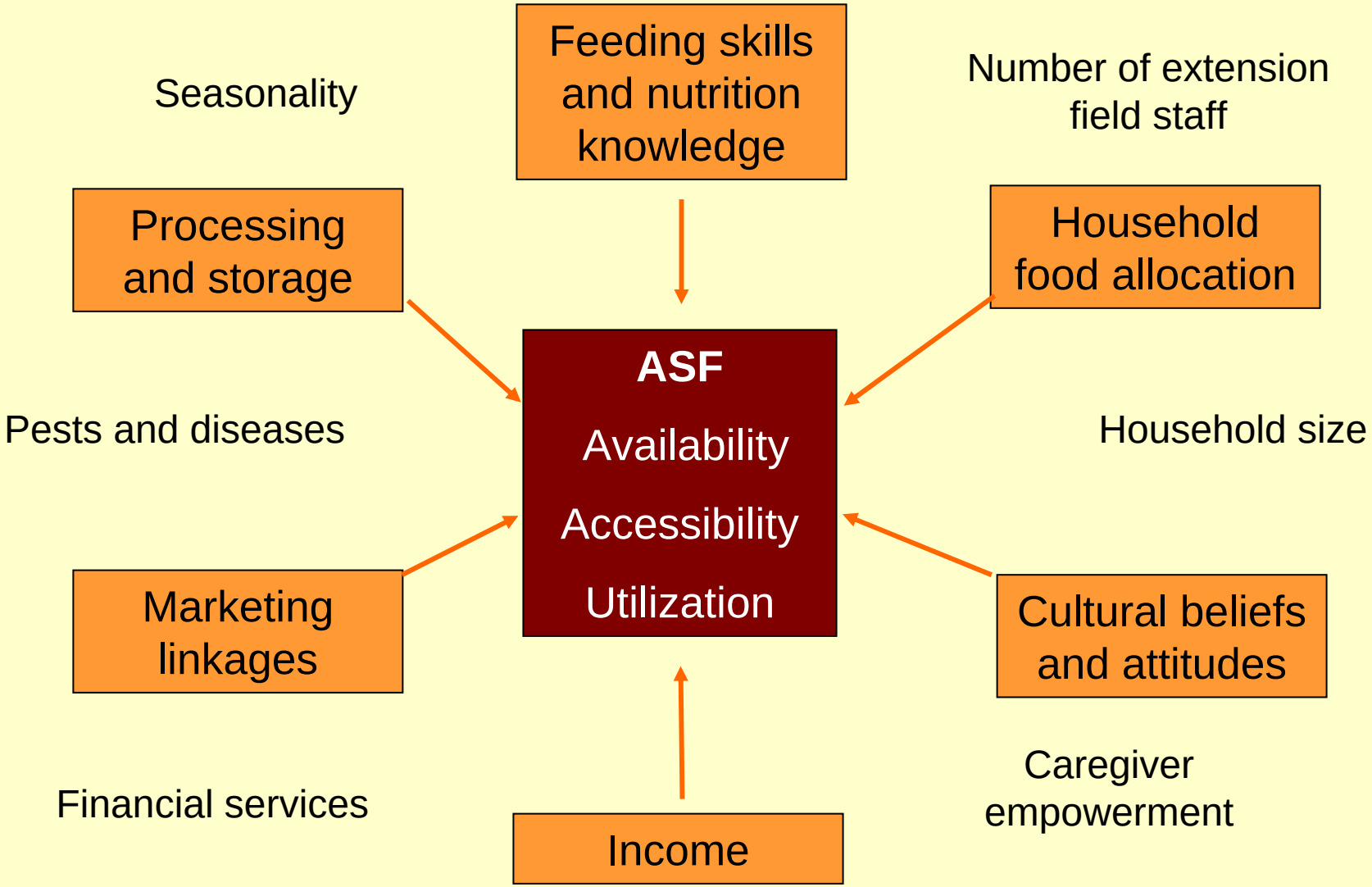
- **Availability, accessibility, utilization**
  - **Regional & national managers in agriculture and health ministries**
  - **Non-governmental organization staff**
  - **Extension workers**
  - **Community leaders**
  - **Caregivers**

Stakeholders' workshop to analyze results

Participants

- **Researchers**
- **Ministry of Food and Agriculture (MOFA)/Women in Agriculture and Development (WIAD)**
- **Ghana Health Services (GHS)**
- **Commodity organizations**
- **Non-governmental organizations**
- **Community residents**

Final problem model for constraints on ASF



Phase 2

Implement an income-generation and education/training intervention

Research question

Does the implementation of an intervention with micro-credit, entrepreneurship training, and nutrition education improve household food security, use of animal source foods for children, and children's nutritional status in rural Ghana?

Selection of research communities

Distinct ecological zones

Upper East Region

Brong-Ahafo Region

Central Region

2 intervention &
2 control
communities
per zone

Operation of project activities

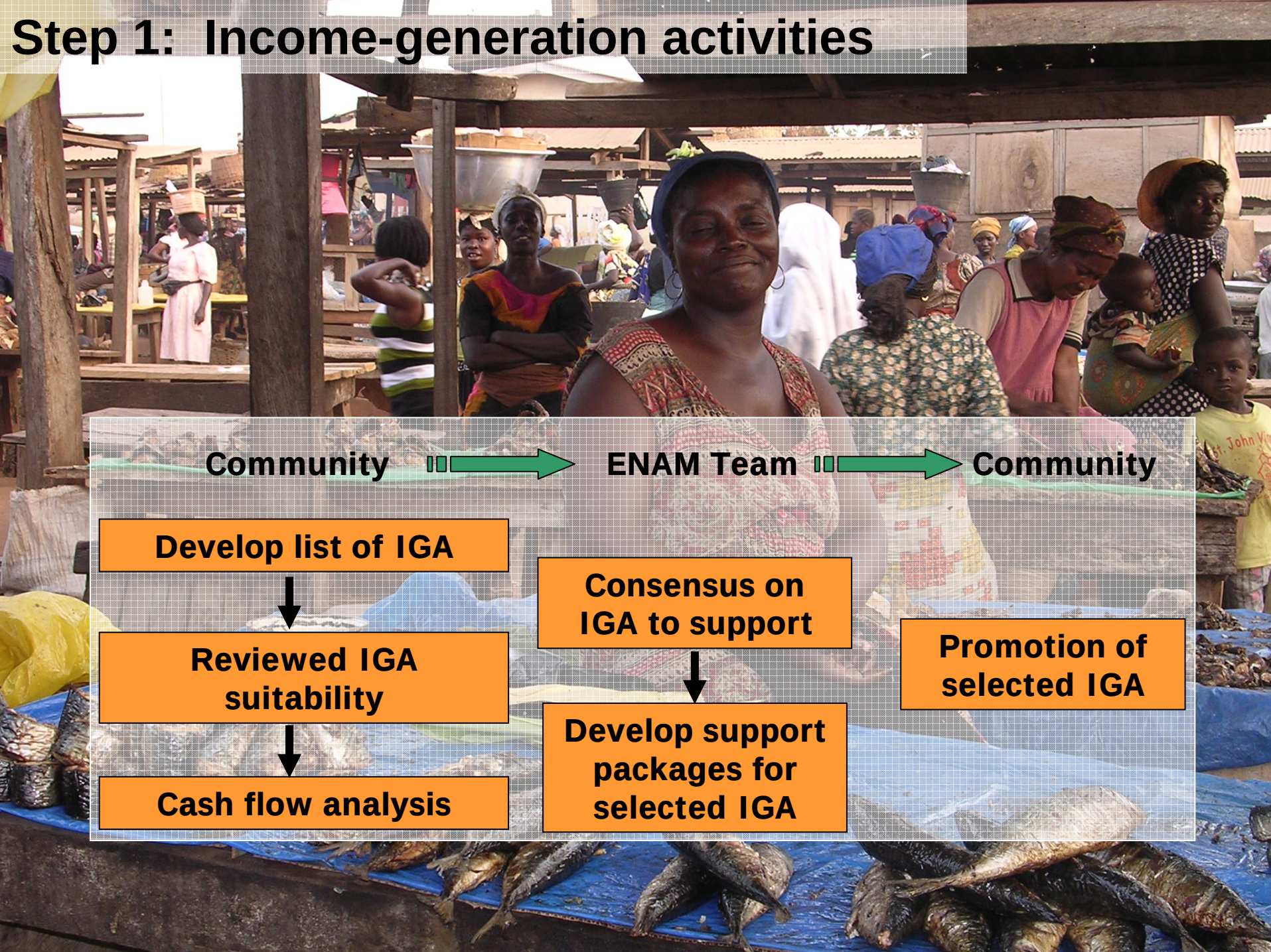
Microcredit loans & savings

Nutrition education

Weekly meeting

Entrepreneurship education

Step 1: Income-generation activities



Community → **ENAM Team** → **Community**

- Develop list of IGA
- Reviewed IGA suitability
- Cash flow analysis
- Consensus on IGA to support
- Develop support packages for selected IGA
- Promotion of selected IGA

Supported IGA

- Fish smoking
- Fish selling (fishmongering)
- Poultry egg production
- Selling of foodstuffs
  (yams)
- Selling of cooked foods
- Processing & sale of foods
  (shea butter, rice parboiling)

Organization of micro-credit for IGA

Orientation training

Eligible caregivers for solidarity groups (3-5/group)

Loan requirements:
- Group concept
- $50 maximum initially
- Loan cycle (16 wk)
- Repayment weekly
- Savings (10%)
- Education

Future loans require:
- Meeting attendance
- Savings
- Group appraisal

Caregiver self-selection

Solidarity group

Solidarity group

Solidarity group

Solidarity group

Loan appraisal

CSA leadership
- **President**
- **Treasurer**
- **Secretary**
- **Organizer**

Village Credit & Savings Association (CSA)

Develop group rules and by-laws
- **Membership requirements**
- **Penalties**

Step 2: Nutrition education

Weekly education sessions before loan/saving payments

- Group dynamics
- Lesson: cycles 1,2,4

Technical assistance

- Health Promotion Unit of Ghana Health Services
- Women in Agriculture Development (WIAD)

Teaching approaches

- Flip charts for group discussion (e.g., balanced plate)
- Cooking competition

Step 3: Entrepreneurial education

Weekly education sessions before loan/saving payments

- Group dynamics
- Lessons: cycles 2, 3, 4

Teaching approaches

- Flip charts for group discussion
  - •Marketing and customer care
  - •Record keeping
  - •Financial literacy
- Skits on lessons learned

Technical assistance

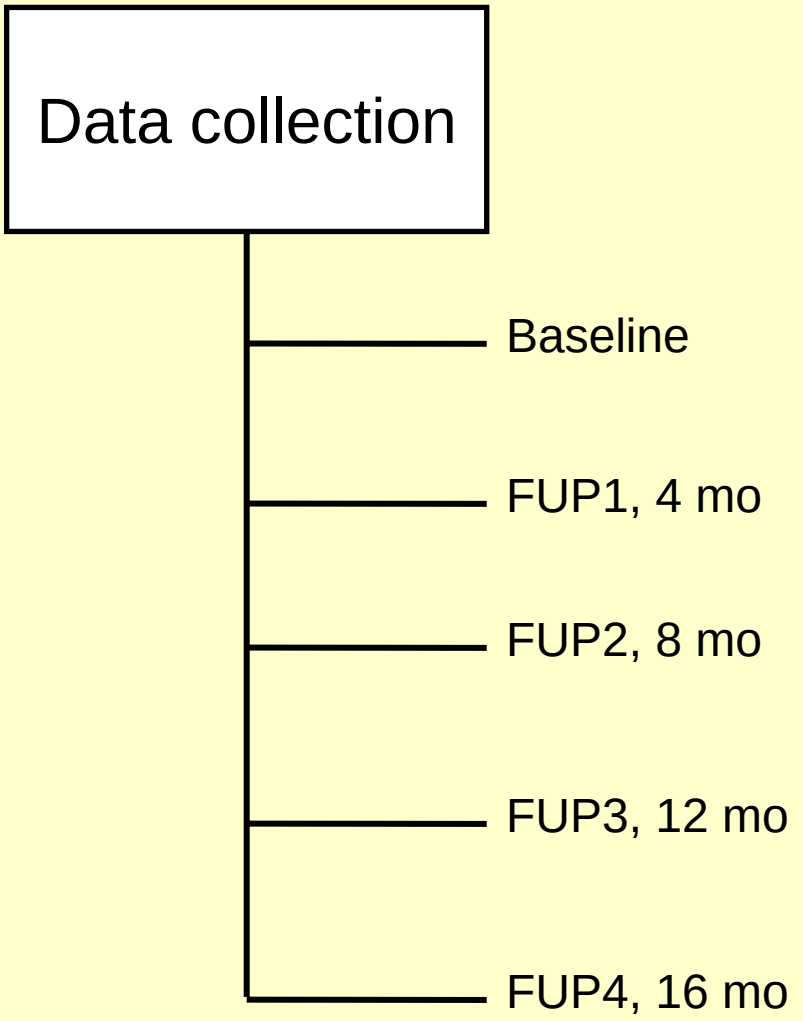
- Women in Agriculture Development

Participants interviewed

179 participants
- open to all women with 2-5 y old children living in community
- self-selected

142 non-participants
- living in community with 2-5 y old child
- matched wealth ranking

287 controls
- living in control community with 2-5 y old child
- matched wealth ranking



Longitudinal data collected

- Microcredit performance
  - Meeting attendance
  - Repayments
  - Savings
  - Cash flow for IGA (sub-sample)
- Household
  - Socio-demographic
  - Food security
  - ASF expenditures
- Caregiver
  - Child nutrition/health knowledge
- Child
  - Dietary intakes
    - FFQ
    - Weighed food (subsample)
  - Anthropometry

Other data collected

Case studies (post intervention only)

Baseline household characteristics

- More than 55% of households were low wealth rank
- Most heads of household were farmers
- About ½ heads of household had some formal education

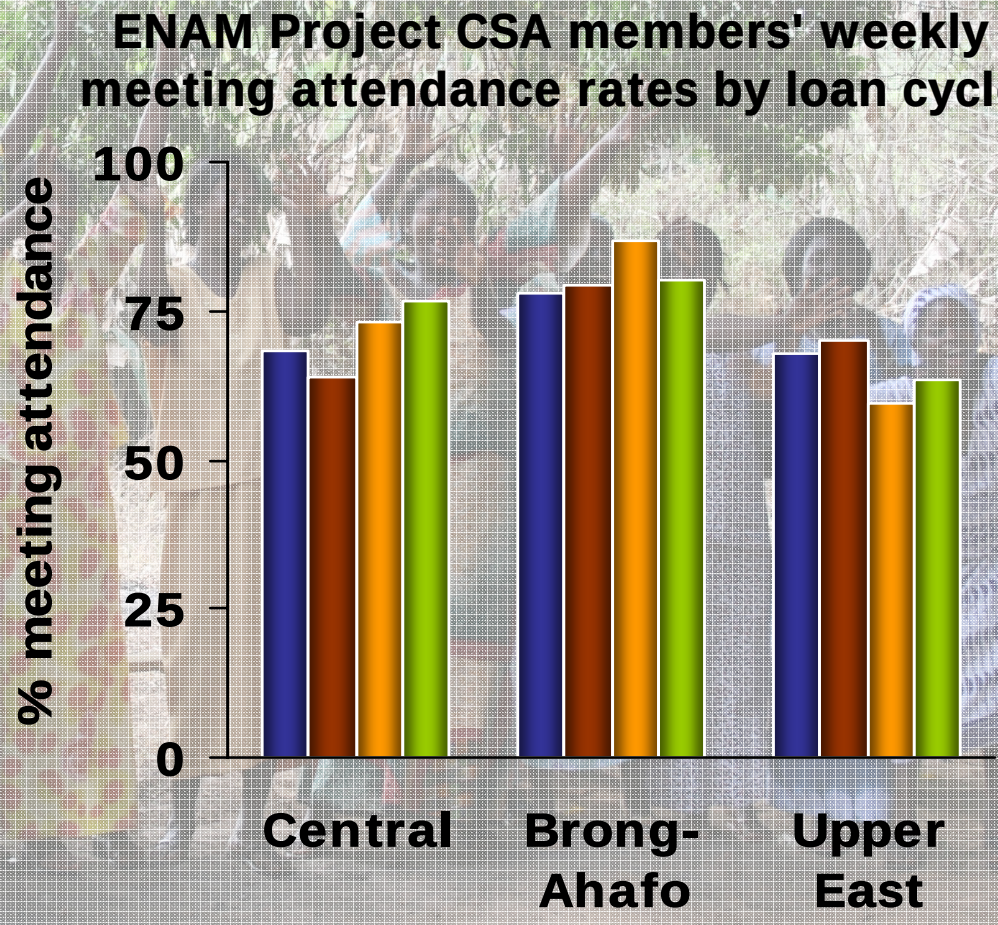
Baseline caregiver characteristics

- About ¾ of women lived with a spouse
- Less than ½ of women had any formal education
- About ¾ of intervention women were traders

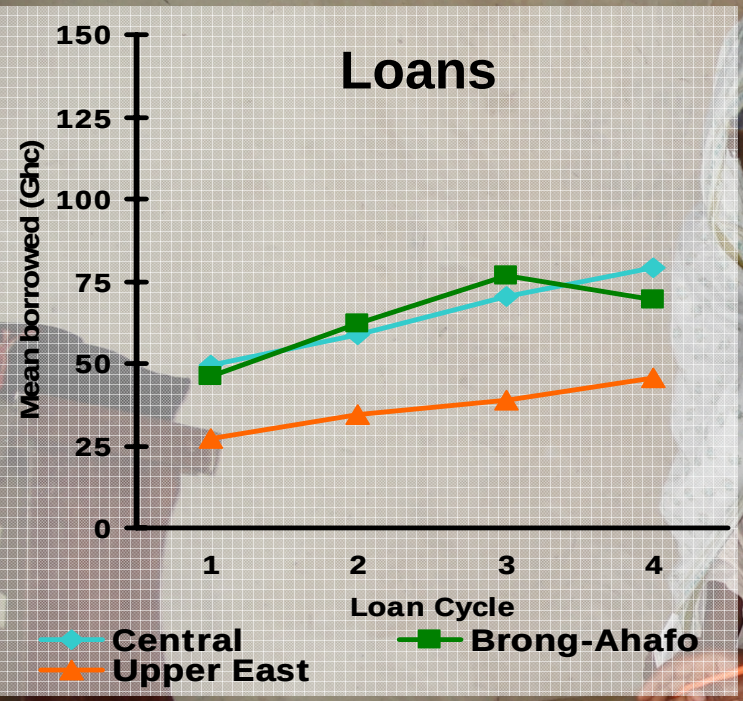
Baseline child characteristics

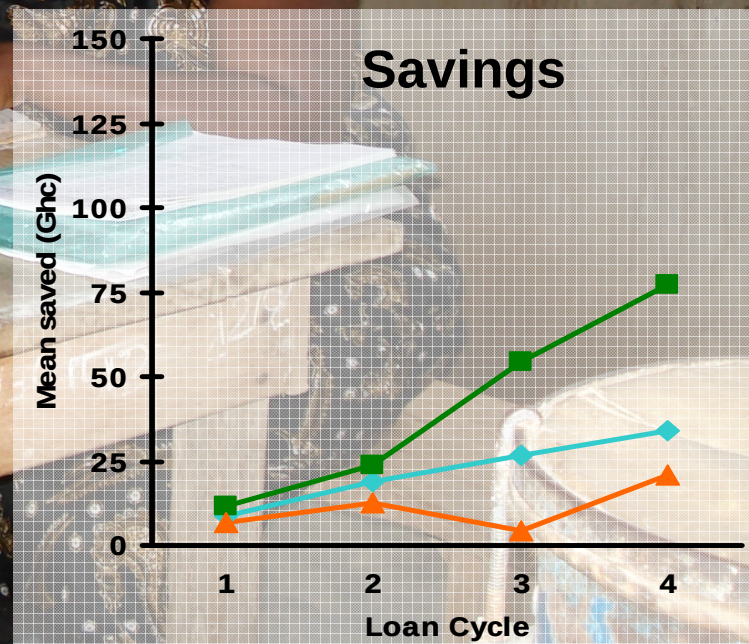
- Children were 3.5 y old, on average
- About 30% of children were stunted
- Wasting was uncommon (< 3%)

Evidence that the intervention took place



Microcredit performance 100% recovery in 16-21 wk/cycle

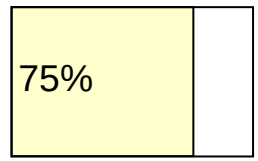




Baseline: No group differences in household food insecurity in previous month

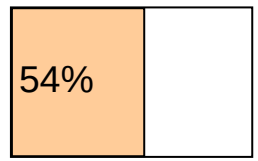
Questions about household concerns about food supply

We have been worried that our food would run out before we could get more



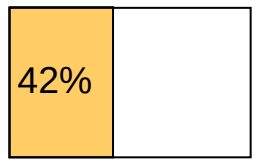
… inability to meet diet quality expectations

We have not been able to feed our 2-5 years old child the kinds of food we feel they need to be healthy



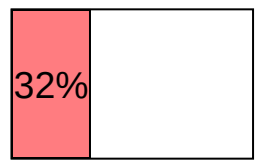
… strategies to meet adult insufficiency

Did you or other adults in your household ever reduce the amount of food you ate or skip meals because there wasn't enough food?



… strategies to meet child insufficiency

Did your 2-5 years old child ever eat less meals than usual because there wasn't enough food in the house?

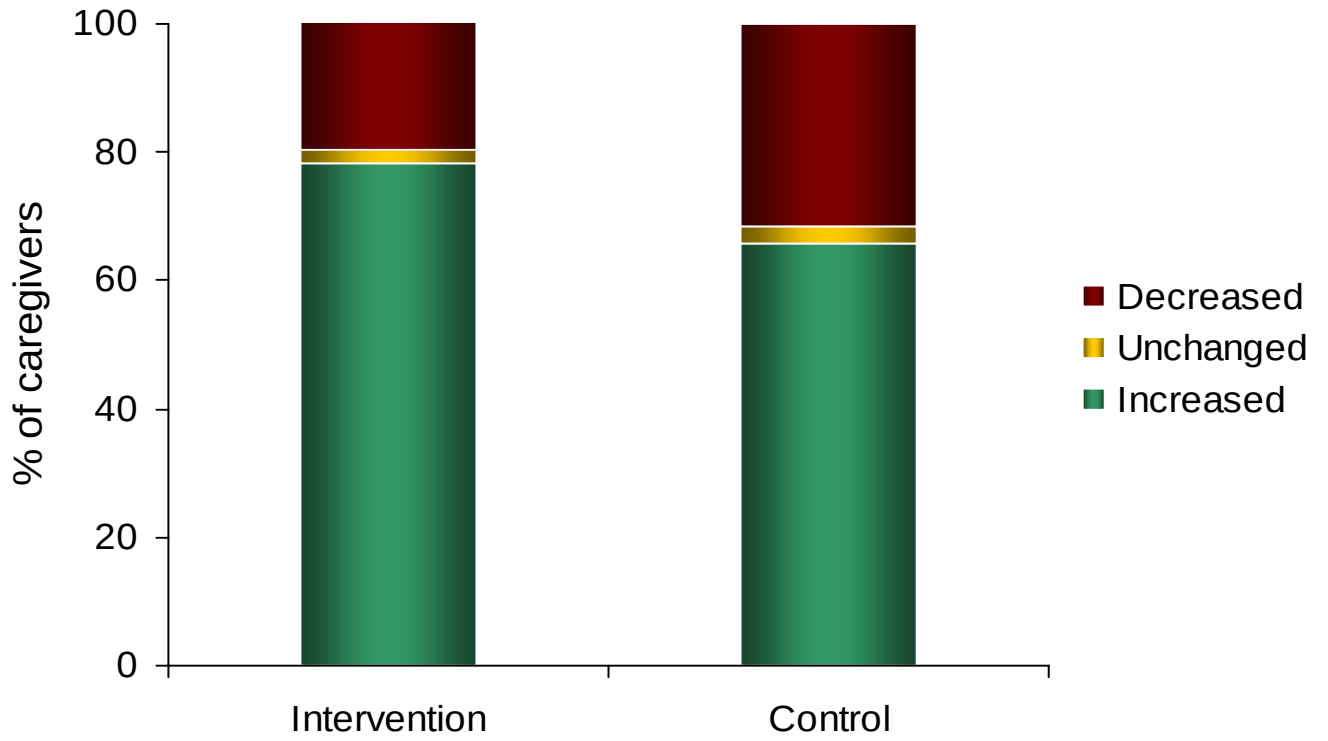


After 16 months, intervention families were half as likely to report food insecurity as comparison families

(OR=0.50; *p*<0.001).

The intervention improved caregivers' nutrition knowledge

Change in caregivers' nutrition/health knowledge scores between baseline and follow-up 4



P<0.05

Sakyi-Dawson, 2009

Micronutrient intakes increased among children in intervention households

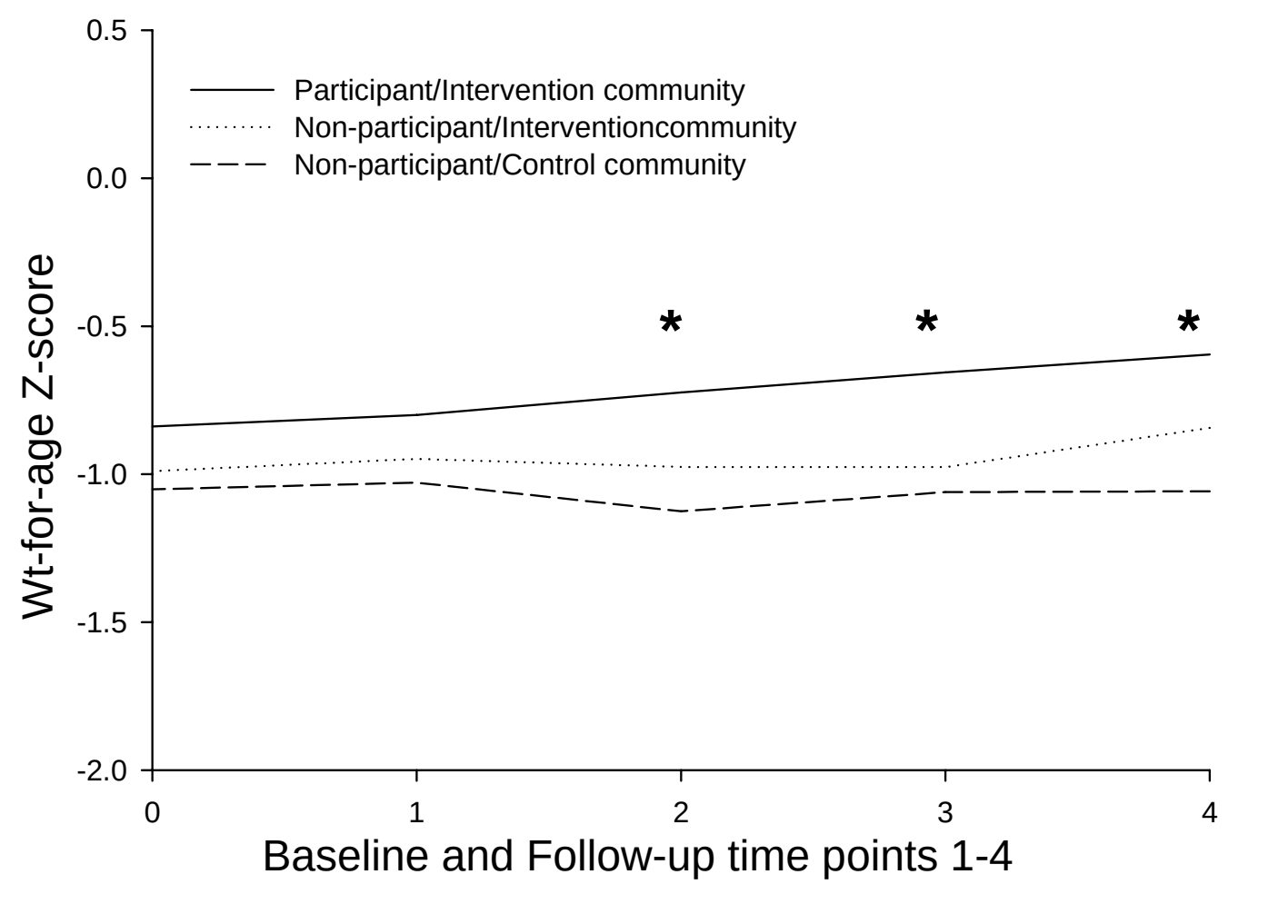
	Intakes at follow-up 3	
	Intervention	Control
Energy, Kcal	1072 ± 59	941 ± 64
Protein, mg	**27.0 ± 1.8**	**20.1 ± 1.8**
Vitamin A, ug RE	545 ± 86	525 ± 79
Calcium, mg	**185 ± 17**	**123 ± 11**
Zinc, mg	**5.2 ± 0.5**	**3.9 ± 0.4**
Iron, mg	12.3 ± 1.0	10.1 ± 0.9

Dietary intakes based on 2-day weighed food records (Mean ± SE)

In bold P<0.05

Lartey A. 2008

Intervention effect on child weight-for-age

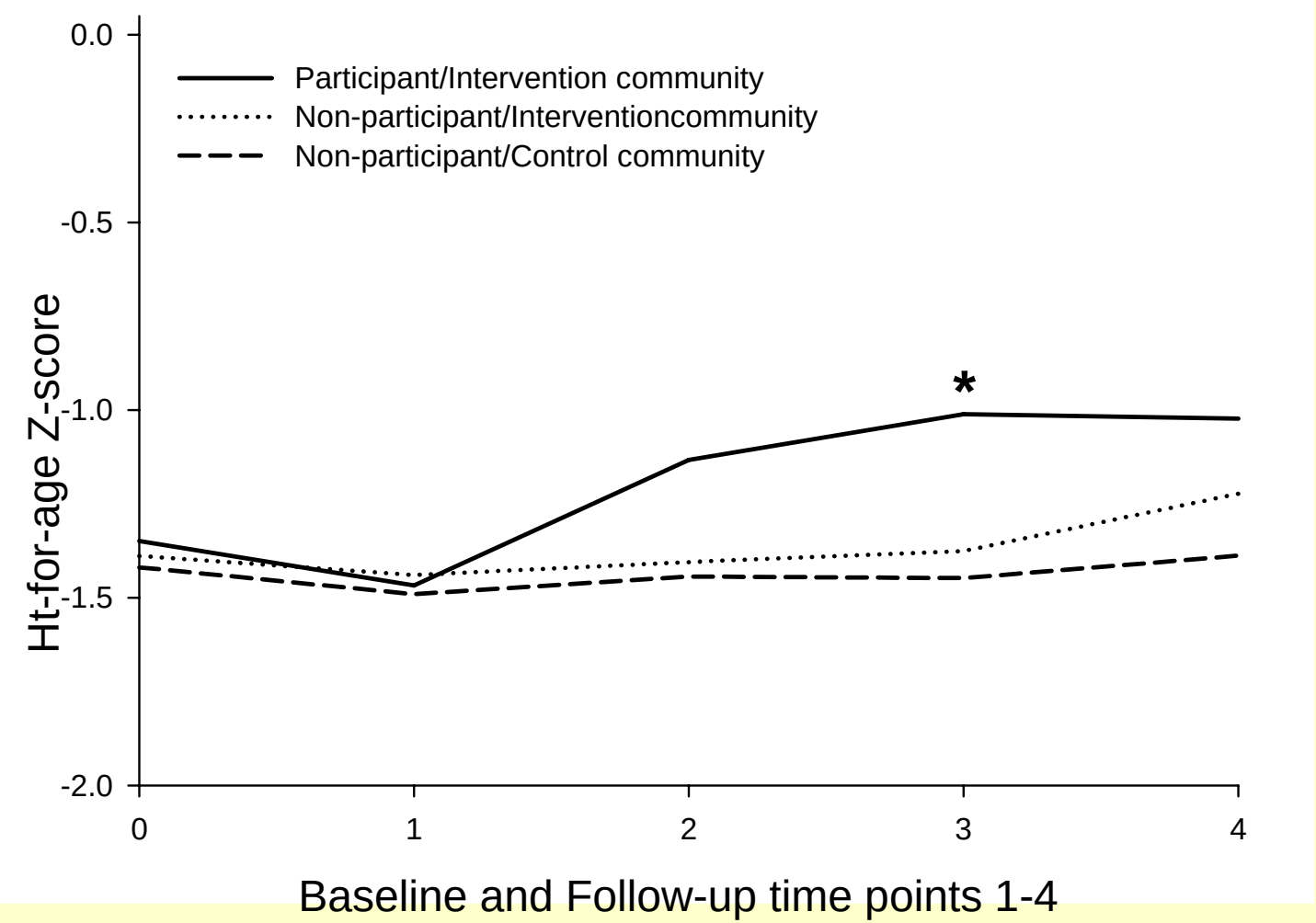


Mixed linear regression hierarchical model

Includes district, lives with partner, income, caregiver occupation, time

Intervention effect overall: **+ 0.26 Z-score** ***P*< 0.001**

Intervention effect on child height-for-age



Mixed linear regression hierarchical model

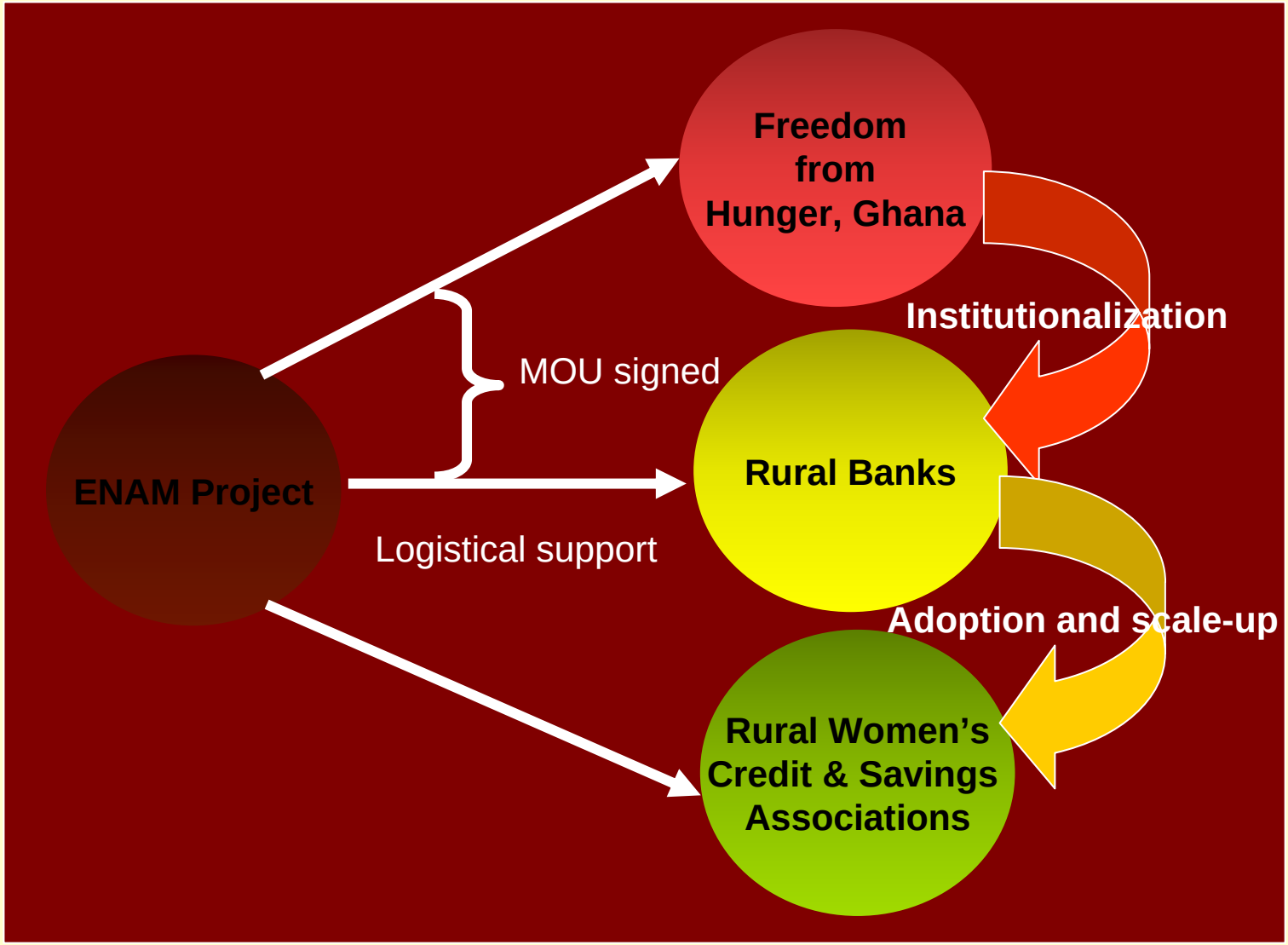
Includes district, lives with partner, income, caregiver occupation, time

Intervention effect **+ 0.11 z-score** ***P*= 0.12**

Phase 3

Transfer of activities to local agents for sustainability

Partnership framework for sustainability



Progress of the Partner Rural Banks (December 2007-March 2009)				
Indicators	**Partner Rural Bank**			
	Akyempim (Winneba)	**Fiagya** (Techiman)	**Naara** (Navrongo)	**Total**
Number of women*	1157	782	318	2257
Number of credit groups	51	33	12	96
Number of communities	N/A	12	3	
Loan portfolio (GH¢)	716,210	497,280	28,010	1,241,500
Loan recovery rate (%)	100	100	100	100
Cumulative savings	42,626	N/A	6,025	
Number of microfinance staff	6	4	2	12

* Each bank inherited two women's groups from the ENAM project. A total of 184 women in six communities benefited from ENAM loans for a total of US$12,000 (~ 1 USD: 1 new GH cedi).

"We must say that at the end of the Credit with Education loan cycle we had 100% recovery which is unprecedented in the history of any loan product of the bank "

Microfinance coordinator, participating rural bank, Northern Ghana

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