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Sponsored by:
The role of small scale aquaculture and enhanced homestead food production in improving household food security and nutrition

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Conflict of Interest Disclosure

I have no conflict of interest to report in relation to this presentation.
Study Rationale

• ~50% of Cambodian households experience some form of poverty, and 20% are severely impoverished.
• There is an urgent need to develop more diverse and environmentally sustainable food production systems.
• Helen Keller International has implemented a program of Enhanced Homestead Food Production (EHFP) in Cambodia and elsewhere.
• EHFP fosters year-round production of nutrient-rich fruits, vegetables, and animal-source foods.
• Limited studies exist on the efficacy of EHFP in improving nutritional outcomes.
Simplified Program Impact Pathway

Participation in Agriculture Program

↑ Technology Adoption

↑ Women empowerment

↑ Dietary Diversification

↑ Energy, Protein, and Micronutrient Intake

↑ Food Expenditure

↑ Household Income

↑ Nutritional Status

Adapted from: Masset et al., BMJ 2012.
Study Objectives

Homestead Food Production

Income

Household food security

Maternal and child anemia
Study Design & Methods

**Cluster randomized controlled trial study design:**
- Baseline (May 2012) and endline (June 2014) cross sectional surveys
- Three study arms: 1) EHFP (plant only); 2) EHFP+F (plants + fish); 3) control

**Participants:**
- Cambodian women (n=900) of reproductive age (18-45 y) and their children aged 6-59 mo from poor households (n=900) in rural Prey Veng province

**Additional data collected for biochemical and dietary analyses:**
- Venous blood sample collected (n=450 women)
- Complete blood count (CBC) and serum analyses (n=450 women)
- 24 hour dietary recalls (n=450 women and children)
Study Timeline

2012

BL Survey

Intervention

Monitoring

2014

EL Survey
METHODS

Intervention Package

• Community-based support services
  • Village Model Farm
  • Nursery ponds
  • Hatcheries

• Training
  • Small scale agriculture and aquaculture production
  • Nutrition and WASH
  • Gender empowerment
  • Marketing and financial literacy

• Behaviour Change Communication materials

• Input management (e.g. seeds, seedlings, fingerlings etc.)
Enhanced Homestead Food Production (plant only)
Enhanced Homestead Food Production + Aquaculture
Innovation: Small-scale Polyculture
Innovation: Small-scale Polyculture
Innovation: Hatcheries, Nursery Ponds
Intervention Package: Aquaculture BCC Materials
Poster on Fish Feed Preparation
Intervention Package: Aquaculture BCC Materials
Poster on Small Fish Cooking Process
Outcomes

Maternal and child anemia
Outcomes

Based on HemoCue, 41% women and 63% of children were anemic at baseline.
Outcomes

No significant difference in women’s or children’s hemoglobin concentration or anemia prevalence between any group at 22-months.
Outcomes

Household Food Security
Outcomes

EHFP+F group was more likely (OR: 1.73; 95% CI: 1.02-2.94) to be food secure as compared to control (P=0.044)
A similar trend among EHFP (plant only) group when compared to control (OR: 1.34, 95% CI: 0.79-2.27; P<0.282) but not significant
Outcomes

Homestead Food Production
Outcomes

At 22-months, the EHFP (plant only) and EHFP+F groups produced significantly more fruit, vegetables and fish as compared with the control group (EHFP: mean ration 3.04, p<0.001; EHFP-F group: mean ratio 4.01, p<0.001).
Outcomes

Income
Outcomes

The EHFP and EHFP+F groups had significantly higher income from the sales of HFP produce as compared to control (EHFP group: mean ratio 1.77, p<0.05; EHFP+F group: mean ratio 1.58, p<0.001)
Outcomes

Across all groups, this additional income after consumption was used to buy micronutrient-rich animal-source foods such as beef, pork, chicken and fish.
Study Limitations

• Higher attrition than anticipated
  • 16% of households
  • 37% for WRA
• Seasonal effects were not captured in surveys.
• Households were assigned to interventions or control groups rather than given a choice of EHFP package.
• May have been too short of duration to see an effect of a nutrition-sensitive agriculture intervention.
Conclusion

• Increased production on vegetable, fruit and fish
• Increased consumption of vegetable and fish
• Increased income from sale of surplus vegetable and fish
• Improved households food security
• No improvement in nutritional status
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