Aquaculture and Horticulture Linkages with Dietary Diversity in Children 6-23 Months of Age

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Background

- The diets of poor Bangladesh households are made up predominately of rice. Consumption of fish, fruits, and vegetables have increased in the past 30 years, however diets are still lacking in quality protein.[1]

Objectives and Methods

- The Bangladesh Aquaculture and Horticulture Nutrition Research study is a longitudinal observation study taking place in Dhaka, Barisal, and Khulna divisions in Bangladesh. The study includes 3060 households in the 102 unions included in the Feed the Future (FtF) baseline survey, and is representative of the FtF "Zone of Influence". Households who completed all three rounds were included in the pooled analysis, totaling 8,322 households.
- The objective of this analysis was to assess the relationship of household-level aquaculture and horticulture production with the diet diversity of children 6-23 months.
- Dietary diversity was defined by count of food groups consumed in the past 24 hours; including starches, legumes, dairy, meat and fish, eggs, and fruits and vegetables. The Infant and Young Child Feeding Minimum Diet Diversity (IYCF MDD) indicator was created for Rounds 2 and 3 and included the vitamin A-rich fruits and vegetables food group.
- Participation in aquaculture was defined as production of fish from aquaculture pods, and horticulture was defined as production of fruits and/or vegetables from an agriculture plot or homestead garden. Households were classified as participating in neither aquaculture nor horticulture, only aquaculture or horticulture (either), or both aquaculture and horticulture (noted throughout as neither, either, or both, respectively).
- Data collected were used to compute diet diversity of children, household engagement in aquaculture and horticulture, household food security, education level of the child's female caregiver, gender of the household head, and household wealth index.
- Data were analyzed in Stata® SE version 15 and include descriptive statistics, bi-variate statistics, and multi-variate logistic regression analyses adjusted for clustering.

Results

Figure 1: Aquaculture and horticulture engagement

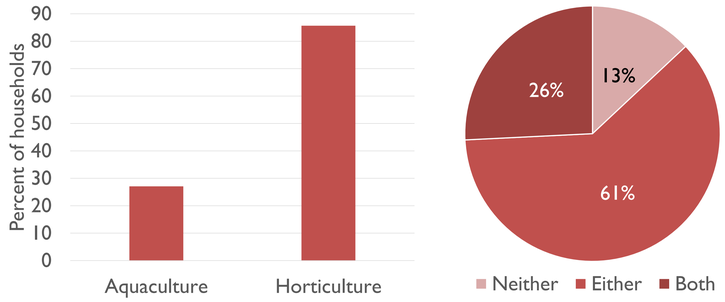


Figure 2: Child's dietary diversity by aquaculture and horticulture engagement

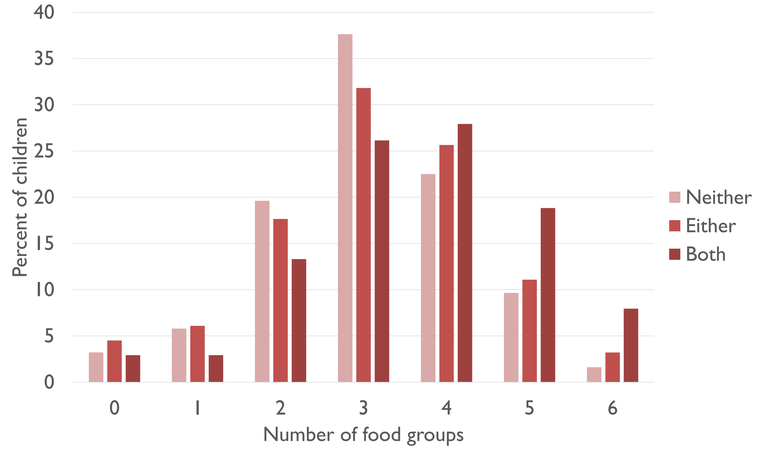
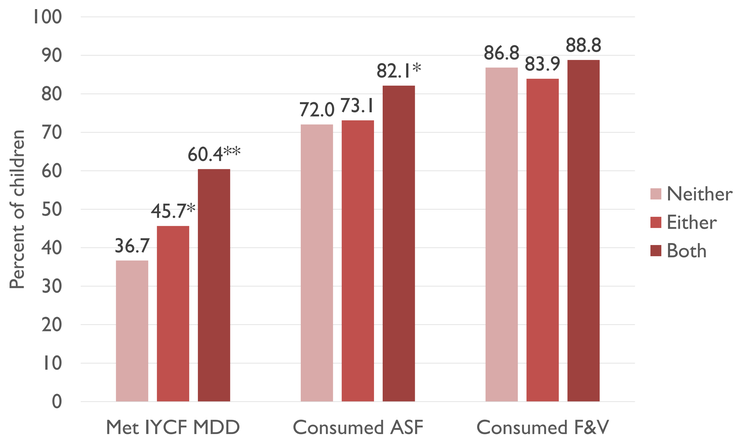


Figure 3: IYCF MDD and consumption of nutrient-dense foods by aquaculture and horticulture engagement



Note: All significance levels are indicated as ** p<0.01 and * p<0.05.

Table 1: Relationship of aquaculture and horticulture production with child's dietary diversity

	Food groups Coefficient (SE)	IYCF MDD OR (SE)	ASF OR (SE)
Household engagement in aquaculture and horticulture			
Neither (reference)	-	-	-
Either	0.995 (0.08)	**1.427*** (0.26)	0.931 (0.14)
Both	**1.405**** (0.13)	**2.209**** (0.45)	**1.416*** (0.25)
Wealth quintile			
Poorest (reference)	-	-	-
Poorer	1.100 (0.09)	1.120 (0.21)	**1.465**** (0.22)
Middle	**1.253**** (0.11)	**1.659**** (0.31)	**1.672**** (0.26)
Richer	**1.537**** (0.14)	**2.437**** (0.47)	**1.977**** (0.32)
Richest	**1.604**** (0.15)	**2.994**** (0.62)	**2.457**** (0.45)
Female caregiver education			
None (reference)	-	-	-
Primary incomplete	1.042 (0.12)	1.348 (0.33)	1.372 (0.26)
Primary complete	1.066 (0.12)	1.405 (0.34)	**1.522*** (0.29)
Secondary incomplete	**1.248*** (0.12)	**1.564*** (0.35)	**1.999**** (0.34)
Secondary complete or higher	**1.678**** (0.19)	**2.347**** (0.60)	**2.701**** (0.58)
Survey round			
Round 1 (reference)	-		-
Round 2 *(IYCF MDD reference)*	**1.207**** (0.07)	-	**1.501**** (0.16)
Round 3	**2.230**** (0.15)	**2.821**** (0.33)	**2.654**** (0.37)
Division			
Barisal (reference)	-	-	-
Dhaka	**0.785**** (0.06)	0.785 (0.12)	1.199 (0.17)
Khulna	**0.735**** (0.05)	**0.482**** (0.07)	0.791 (0.10)
Gender of household head *(female reference)*	1.075 (0.08)	1.068 (0.18)	0.983 (0.14)

Note: All significance levels are indicated as ** p<0.01 and * p<0.05.

Conclusions

- Adjusting for clustering, location, gender of the household, wealth and education, children living in households that participate in both aquaculture and horticulture consume more diverse diets. They are more likely to consume ASF (irrespective of type of ASF).
- Similarly, children living in households that participate in either aquaculture or horticulture, or both, are more likely to meet the IYCF MDD.
- The odds of increasing diversity, consuming ASF and achieving IYCF MDD increased with wealth, education and survey round. The regions of Dhaka and Khulna had lower estimates than Barisal.
- The increased consumption of all types of ASF indicates an improvement in diet through not just household consumption but possibly improved income, indicating an important role for investments in technologies that increase access to aquaculture and horticultural products in improving nutrition.

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[1] FAO & WHO. (2014). Country Nutrition Paper: Bangladesh. Rome, Italy.