Assessing the Nutritional Impact of Aquaculture Policy in Fish Farming Districts in Tanzania and Ghana

Human Nutrition and Human Health Impacts of Aquaculture/Study/13HHI01PU

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Abstracts

The study assessed the benefits that manifest themselves in nutritional outcomes from households engaged in fish farming in Ghana (Ashanti and Brong Ahafo regions) and Tanzania (Morogoro and Mbeya regions). Fish is an important source of protein and essential micronutrients for many African households and participation in fish farming could have both direct effect through fish consumption, and indirect pathway through an income effect for nutritional impact. The study used the World Food Program's (WFP) Food Consumption Score (FCS) measures to assess nutritional quality with a target on fish. The average FCS value for fish-farming households in Ghana was 72 while that of nonfish-farming households (control group) was 68. In Tanzania, it was 56 for fish-farming households and 58 for the control group respectively. The results suggest that in Ghana, fish-farming households have higher diet diversity and food security than the nonfish-farming households, while in Tanzania, the opposite is the case. A two-stage least squares (2SLS) approach used to analyze the data for Ghana showed that household income, mother's education and residing in an urban area positively affect FCS and consequently dietary diversity and nutritional quality. In Tanzania however, an ordinary least squares (OLS) analysis of the data showed household income, residing in an urban area and the index for wealth positively affect dietary diversity and nutritional quality. The mother's education appears to be a very strong predictor of the household FCS because of her being the main caregiver, and her influence on the household's nutrition can be substantial. Moreover, an educated person is assumed to know the right kinds of foods to buy in terms of nutritional quality as well as the dietary diversity to boost household health. The index for wealth is a good indicator of the household's socioeconomic status and is assumed to influence the purchase and consumption of high-quality and nutritionally balanced foods.

Introduction

The Millennium Development Goals (MDGs) adopted by the world's leaders at the Millennium Summit of the United Nations in 2000 sought to achieve peace and decent standards of living for every man, woman and child. The MDGs aim to eradicate extreme poverty and hunger, achieve universal primary education, promote gender equality and empower women, reduce child mortality improve maternal health, combat HIV/AIDS, malaria and other diseases, ensure environmental sustainability, and develop global partnerships for development. Tanzania and Ghana committed to the time-bound MDGs and the associated indicators.

Aquaculture is one of the world's fastest growing food production sectors with great potential for food supply and poverty alleviation and is responsible for at least 50% of the fish consumed by humans (Diana 2009). Fish farming has contributed toward poverty alleviation in poor societies in various parts of the world where it is traditionally practiced, e.g., Bangladesh (Jahan et al. 2010) and Nepal (Bhujel et al. 2008). Aquaculture expansion in Asian countries such as Bangladesh and Thailand has led to enhanced food security among adopters and the population at large (De Silva and Davy 2010, Jahan et al. 2010, Lazard et al. 2010). In Bangladesh, Thilsted et al. (2014) reported that even though fish is quite expensive, consumption in small quantities makes a significant difference in contributing to the nutritional quality of the diets of poor people. In Asia, fish was found to be the major source of protein for low income households even though they consumed less compared to rich households (Dey et al. 2005).

Helen Keller International (HKI) established a direct linkage between agriculture and nutrition particularly for farmers and agricultural laborers from homestead food production in Bangladesh, Cambodia, Nepal, and the Philippines (HKI/Asia-Pacific 2001). The HKI program promoted small-scale production and consumption of micronutrient-rich crops and small animals, which resulted in vulnerable members of low-income households producing and consuming more micronutrient-rich foods and earning increased incomes from the sale of high-value products. Thus, improving food and nutritional security requires adequate food supply, and access to food by households from own production, the market or other sources, and the appropriate utilization of those foods to meet the dietary needs of the households. Effective agricultural interventions on household nutrition involve diverse and complementary processes and strategies that focus on agricultural production for food as well as a focus on women empowerment, livelihoods and optimal use of intra-household resources (World Bank 2007).

In sub-Saharan Africa, aquaculture development aims to improve food security and human nutrition; increase domestic fish production; create employment; promote diversification and reduce risk; promote economic development; and improve efficiency in the use of resources, especially water (Béné and Heck 2005, Satia 2011). Households along Lake Chad that were plagued by chronic food shortages were reported to have sold part of their fish harvests from ponds to improve incomes compared to well-off farming households (Karim 2006). Bueno (2009) suggests that the fish farmer's goal is often to produce the family animal protein food supply and sell part of the harvest for additional family income. Aquaculture is considered an option for rural development because it provides an important opportunity to help solve problems of poverty, and protein malnutrition of the rural poor. Consequently, small scale aquaculture has been identified as an occupation for income generation, women empowerment and increase in food availability in developing countries (Stepan 2013).

As the Tanzania and Ghana governments continue to implement their fisheries and aquaculture strategic plan, it is important to highlight nutritional impacts to ensure that the nutritional outcomes of aquaculture development or, for that matter, any new agricultural policy are accounted for in the implementation or intervention plans. Accounting for changes in nutritional outcomes is particularly relevant in Tanzania and Ghana given the efforts of the various governments to improve nutritional security.

OBJECTIVES

The focus of this study is to look beyond the direct production measures from fish farming in rural communities and consider the additional benefits that manifest themselves in nutritional outcomes. Given that fish is an important source of protein and essential micronutrients for almost all African households, this study evaluated the impact of participating in fish farming on household nutrition. Some empirical questions that were addressed were: (1) How much better off is a fish-farming household compared to a nonfish-farming household in terms of dietary diversity and nutritional adequacy? (2) What are the impact pathways for aquaculture on household nutritional improvement? The objectives of the study were to:

- Assess improvements in household food security and nutrition in selected fish-farming communities using measures of household nutrient adequacy (food security) and dietary diversity;
- Measure the effect of aquaculture as an input and technology transfer program on household food security using nutritional indicators; and
- Suggest some policy recommendations regarding aquaculture and nutrition improvements.

METHODS

Measurement of the impact of technology adoption in the agriculture literature, especially in sub-Saharan Africa (SSA) has traditionally been done using monetary and farm production measures, particularly income and expenditure. These measures indirectly capture the impact of adopting the technology using household welfare measures as a proxy (Magrini and Vigani 2014). Some studies have made indirect conclusions about household food consumption using household poverty indexes combined with the income or expenditure consumption measures (see for example Kassie et al. 2011, Amare et al. 2012, Asfaw et al. 2012). In these studies, the impact of adopting an agricultural technology on poverty has been found to be significantly negative. Poverty was used as an indicator of the household's economic access to food. The problem with these measures is the assumptions made about the utilization of food (Hidrobo et al. 2012). In a recent paper published by the World Bank, it was identified that enhancing agricultural productivity does not necessarily improve the food security of a household (Herforth et al. 2012). The Food and Agriculture Organization of the United Nations (FAO) agreed to this assertion by concluding that the fact that a household participates in an agricultural intervention does not necessarily mean their nutrition will improve. To better assess nutritional impacts of policy interventions, a number of frameworks have been introduced to capture the nutritional influence on household health through direct and indirect impact ways. For aquaculture, the direct ways include the household consuming fish from their pond, and also selling the fish to buy other sources of protein. The indirect ways include employment creation, economic growth and environmental benefits. This study focused on the impact through direct consumption and the income effect.

The concept of measuring household nutritional quality and food security is elusive. Such measures are often believed to be based on the diversity in the household's diet. The World Food Program (WFP) and other development organizations have consequently developed and validated some indicators for assessing household food security. Some of the measures are Household Food Insecurity and Access Scale (HFIAS), The Household Hunger Scale (HHS), Food Consumption Score (FCS), and Household Dietary Diversity Scale (HDDS) (Maxwell et al. 2003).

The FCS appears to be the commonly used measure in the literature. For example, Arimond et al., (2010) in their study outlined dietary diversity from a number of foods consumed over a period of seven days and used FCS to capture the quality of the diet as well. The International Food Policy Research Institute (IFPRI) used FCS to assess food security and vulnerability in Malawi and reported that 11.5% of the population fell in the "poor" category, 36.7% in the "borderline" category and 51.8% in an "acceptable" consumption status (IFPRI 2011). The study concluded that growth in staple crops contributed more to calorie intake and poverty reduction than growth in export crops (IFPRI 2011). Saaka and Osman (2013) used FCS because of its accuracy in capturing food quality for the household as well as nutritional value and the frequency of consumption of particular food items. The FCS measure involves the collection of seven days' worth of information of food consumed by the household and are weighted differently according to the energy content of food item (Maxwell et al. 2013). This study adopted the FCS as the measure of household food security due to its ability to give a complete picture of the household's consumption of a specific food item as well as details on food consumption pattern.

Food consumption score (FCS). The FCS is used as a proxy for food security and is measured as a summation of the weighted frequencies of the various food groups consumed (Table 1):

$$FCS = \sum y_i f_i \quad (1)$$

where y_i is the weight or the nutritional value of food group i, f_i is the frequency of food consumption of food group i. Frequency of food consumption is the number of days in a week the food group is consumed. The food groups in equation (1) are cereals and tubers, pulses, vegetables and fruits, meats and fish, sugar, milk, and condiments. We hypothesize that fish-farming households have higher diet diversity and food security than the nonfish-farming households. The assumption is that engaging in fish farming is expected to have a positive and direct impact on the household income. Households will then be able to purchase and consume more diverse food items particularly vegetables, meat, dairy and fresh fruits and a shift away from the cereals and tubers.

In identifying the food security status of a household, the WFP has proposed the following thresholds for the FCS (Table 2): Households with FCS of 0–21 are categorized as having "poor food consumption," those within 21.5–35, "borderline food consumption" and above 35 categorized as having "acceptable food consumption." For households that tend to eat oil and sugar on a daily basis, the threshold are 0 – 28 for "poor food consumption," 28.5–42 and > 42 respectively for "borderline food consumption" and "acceptable food consumption" levels (WFP 2008).

Data and study design. The data used for the study was collected through face-to-face interviews with households in the Ashanti and Brong Ahafo regions in Ghana and in the Morogoro and Mbeya regions in Tanzania. Fish-farming households were selected based on their participation in Aquafish Innovation Lab and AquaFish CRSP training workshops during the past five years. A total of 126 households in Ghana and 55 in Tanzania were interviewed using structured questionnaires. For each fish farming household recruited in Ghana, two nonfish-farming households were selected in the same communities while three non-farming households to one fish farming household was selected in Tanzania. The nonfish-farming households were selected to serve as comparative controls.

Dietary assessment. A three-day-repeated 24-hour dietary recall was collected for each household involving the woman and child. The 24-hour dietary recalls interviews were conducted by two trained personnel of postgraduate nutrition and dietetics students. Usually, one person asked the question and the other recorded. Interviews also were conducted in the local language spoken in the study area. The 24-hour dietary recall included two weekdays and a weekend. Portion sizes of foods consumed were determined using household or handy measures such as tea spoons, desert spoons, orange sizes, egg sizes, matches boxes, sardine tins, stew spoons and soup ladles. These quantities were later on translated to grams based on food composition tables and converted to nutrient intakes using the Nutrient Analysis Templates.

Food consumption frequency. A 42-item, structured food frequency questionnaire (FFQ) was used to collect data on habitual dietary intake for mothers and children in the past six months prior to the study. The essence of the FFQ was to establish if patterns of dietary intake and proportion of intake of specific food groups were different between fish farming and nonfish-farming households. The food items on the questionnaire were grouped into seven main food groups namely: cereals and grains, tubers and roots, meat and meat products, legumes and nuts (pulses), fruits, vegetables and fats and oils. For each food item seven options for frequency of consumption were provided for participants to indicate their habitual consumption of those foods. The options were daily, weekly, fortnightly, monthly, occasionally, once in six months and never.

Fish farming activities and other socioeconomic factors. Households also were asked questions pertaining to household socioeconomic characteristics, especially their income sources from both fish farming and nonfish farming activities. A wealth index was constructed using questions related to household assets. The household income and wealth index were used as indicators of the family's economic status. Information on the education, age, household size, and location also was collected.

RESULTS

Results for Ghana. The statistical summaries of the relevant variables selected for the analysis for Ghana are reported in Table 3. The FCS range from a minimum of 17 to a maximum of 112. A high FCS depicts high diversity in foods consumed by the household. The mean FCS for fish farmers was higher (72.6) than that for nonfish-farming households (68) (Table 3). Fish-farming households also had a higher average income (GHS 4832 = $1,264.92) than nonfish-farming households (GHS 263 = $68.59). The average age was 36 with 93% of respondents being female. Females were actually targeted since they are the traditional care givers. The average years of education for the mother was about eight years and an average of about six people per household. The details of other sample characteristics are found in Table 3.

The data was then analyzed in an econometric framework using the 2SLS analysis approach. In assessing the impact of participation in aquaculture on household dietary diversity, the main challenge is selectivity bias. This is because farmers' participation in aquaculture is self-selective, which poses a potential bias where the participation decision is likely to be correlated with the error term in a regression analysis. The endogenous nature of the participation decision can be addressed econometrically using instrumental variables (IV). The 2SLS approach with instrumental variables captures both the observable and unobservable factors influencing the decision to participate in fish farming and its outcome.

The following represents the conceptual regression equation of the household dietary diversity model:

$$y_1 = \alpha_1 y_2 + \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_n x_n + u \quad (2)$$

where y_1 is the dependent variable FCS; x_1 to x_n are exogenous independent variables namely geographic area (urban=1), age, household income, wealth index, mother's education and household size; and y_2 represents fish farming participation variable, which is assumed to be correlated with the error term u. The inclusion of y_2 as a regressor requires the introduction of instrumental variable(s) z, which should be uncorrelated with the error term but is strongly correlated with y_2;

$$corr(z, u) = 0 \ but \ corr\ (z, y_2) \neq 0 \quad (3)$$

The endogeneity of the fish farming participation variable (y_2) was tested using a Durbin-Wu-Hausman, and the result indicated the presence of endogeneity. A correlation analysis showed that fish farming participation was strongly correlated with households that received technical support (0.87) and those who had participated in an AquaFish training (0.97). Therefore, these two variables were used as instruments.

The 2SLS regression results are presented in Table 5, which show that with the exception of household income, geographic area and mother's education that are significant, the rest are not statistically significant. The coefficient of residing in an urban area is positively significant at the 10% as we expected. The household income was also found to be positively significant at the 1%. The mother's education was positively significant at 5%.

Results for Tanzania. The mean FCS for fish farmers was lower (56.0) than that for nonfish-farming households (58.4) as reported in Table 4. This is contrary to what was expected: that participation in fish farming improves the nutritional status of the household. The average income for fish farming was higher (TZS 487,121 = $229.22) than nonfish-farming households (TZS 113,095 = $53.22) but lower compared to households in Ghana. The average age of respondents was 45 with approximately 41% of respondents being female. The average years of education for the mother was approximately two years and an average of six people per household. Other summary statistics are reported in Table 4.

The econometric analysis of the Tanzania data was done using OLS because there was no issue with endogeneity. The dependent variable was also FCS with fish farming, geographic area, age, household income, wealth index, household size, and mother's education as independent variables. The results presented in Table 6 show that with the exception of household income, geographic area and wealth index which are significant, the rest are not significant. This is similar to results obtained for Ghanaian households, which had the mother's education being significant instead of the wealth index.

DISCUSSION

Reports from the literature suggest that aquaculture is more developed in Ghana than in Tanzania, which is also revealed in the higher average FCS in Ghana for fish-farming households than for Tanzania fish-farming households where nonfish-farming households seem to be more food secure. Nevertheless, the mean FCS of 72.6 for fish farmers and 68.0 for nonfish-farming households in Ghana and 56.0 for fish farmers and 58.4 for nonfish-farming households in Tanzania suggest that, on the average, households in Ghana and Tanzania have "acceptable food consumption" patterns based on WFPs thresholds scores reported in Table 2. The income range is higher in Ghana than in Tanzania as well as the average years of education of the mother. A potential problem with comparing the two studies is the difference in sample sizes with Ghana having a higher sample than Tanzania. These could contribute to differences in the results.

The results from the econometric analyses for both countries indicate that household income and residing in an urban area are the common socioeconomic factors that significantly impacted household food security and dietary diversity. The coefficient of 0.00 index points in the Ghana model implies that a 1% change in the household's income will have a very negligible change to the household's access to a variety of foods. A similar result is found for Tanzania households. The impact of income is consistent with results from Kabunga et al., (2011), who also reported that income earned by women especially, positively impacted household food security and welfare. The income variable was hypothesized to be positive.

These results also suggest that a household residing in an urban area in Ghana has the probability of increasing the family's diet diversity and quality foods by 4.95 index points. The coefficient for Tanzania households is also positively significant at the 10% as expected implying that a Tanzania household that resides in an urban area has the probability of having a diverse diet and higher nutritional quality by 10.11 index points. The effect is quite high in Tanzania compared to households in Ghana. Kabunga et al, (2011) as well as Larochelle and Alwang (2014) reported similar results for Rwanda households.

In Ghana, the mother's educational level is statistically significant, which implies that an additional year in school for the mother will increase the household's food security by 0.80 index points. The mother's education has been reported to be a very strong predictor of the household FCS because she is the caregiver, and her influence on the household's nutrition is substantial (Larochelle and Alwang 2014; Karki and Bauer 2004). An educated person knows the right kinds of foods to buy in terms of nutritional quality as well as the dietary diversity to boost health.

In Tanzania, the index for wealth was positively significant at 1%. This is expected because it is a measure of wealth and assumed to influence the purchase and consumption of high quality and nutritionally balanced foods. Saaka and Osman (2013) and Zeng et al. (2014) concluded that the wealth index is a good indicator of the household's socioeconomic status and could be used as a predictor of the household's ability to comfortably access food.

CONCLUSIONS AND RECOMMENDATIONS

The study evaluated the impact of participating in aquaculture on the nutritional status of households in two regions of Ghana (Ashanti and Brong Ahafo) and Tanzania (Morogoro and Mbeya) to assess both direct and indirect pathways for nutritional impact. The study used FCS, which is a relatively better measure of food security when targeting a particular food item, in this case fish. The average FCS value for fish-farming households in Ghana was 72 while that for the nonfish-farming household (control group) was 68. In Tanzania, it was 56 for fish-farming households and 58 for the control group respectively.

A 2SLS method was used to analyze the data for Ghana due to selection bias among the fish-farming group. The household income, mother's education and residing in an urban area were found to significantly affect FCS and consequently dietary diversity and nutritional quality. The impacts of being a fish farmer on household nutritional quality is likely to be higher and more pronounced than what the study results show. This is because of the different pathways of household income and direct consumption impact household food security.

Food security is diverse and complex (Cunningham 2005) and assessing the impact of aquaculture on it will require a combination of methodologies. Therefore, future studies should involve a much larger sample size as well as coverage area of study. The use of a combination of food security indicators as was done by Saaka and Osman (2013) in northern Ghana to measure the impact of adopting fish farming on household food security is recommended. Field observations indicated that most households consumed low value fish due to affordability. Therefore, the nutritional benefits of consuming fish should be part of the messages that accompany aquaculture development strategies in addition to economic development and employment creation.

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TABLES AND FIGURES

Table 1. WFP food groups and weights used in calculating FCS.

Food Items	Food Groups	Weights
Maize, maize porridge, rice, sorghum, millet, pasta, bread, other cereals; and cassava, potatoes and sweet potatoes	Cereals and tubers	2
Beans, peas, groundnuts, cashew nuts and other nuts	Pulses	3
Vegetables, leave and fruits	Vegetables and fruits	1
Red meat, poultry, eggs, fish	Meat and fish	4
Milk, yoghurt and other dairy products	Milk	4
Sugar and sugar products	Sugar	0.5
Oils, fat and butter	Oil	0.5
Condiments	Condiments	0

Source: WFP (2008)

Table 2. Typical thresholds for FCS for grouping households.

Profiles	Threshold	Threshold with oil eaten and sugar eaten on daily basis (~7 days/week)
Poor food consumption	0 - 21	0 - 28
Borderline food consumption	21.5 - 35	28.5 - 42
Acceptable food consumption	>35	>42

Source: WFP (2008)

Table 3. Summary statistics of variables for Ghana.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Combined Sample					
FCS	159	70.44	18.51	17.30	112.02
Status	162	0.34	0.48	0	1
Geographic area	162	0.43	0.50	0	1
Age	160	36.14	12.34	19	76
Sex	162	0.93	0.26	0	1
Wealth index	162	329.01	230.40	-111.18	841
Mother's education	162	7.85	4.26	0	16
Household size	162	5.64	3.36	1	25
Household income	155	1,736.74	6,282.37	20	71,000
Fish-farming households					
FCS	55	72.55	20.65	25	112.02
Status	55	1	0	1	1
No of ponds	52	3.51	3.04	0	16
Years of farming	54	6.39	5.11	1	28
Pond size	51	1,801.64	2,620.45	150	12,000
Age	55	46.57	13.82	22	76
Geographic area	52	0.44	0.50	0	1
Sex	55	0.80	0.40	0	1
Wealth index	55	409.92	251.05	-35.37	841
Mother's education	55	7.18	5.34	0	16
Household size	55	7.11	4.16	1	25
Household income	50	4,832.02	10,450.19	80	71,000
Nonfish-farming households					
FCS	106	68.02	19.55	0	109
Fish farming	107	0	0	0	0
Age	107	30.82	7.05	19	63
Geographic area	107	0.42	0.50	0	1
Sex	107	0.99	0.10	0	1
Wealth index	107	287.41	208.28	-111.18	812
Mother's education	107	8.18	3.55	0	14
Household size	107	4.89	2.59	1	21
Household income	105	262.79	436.57	20	2,500

Table 4. Summary statistics of variables for Tanzania.

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Combined Sample					
FCS	54	56.96	16.41	1	84.5
Fish farm	54	0.61	0.49	0	1
Geographic area	54	0.81	0.39	0	1
Age	54	45.17	16.86	17	86
Sex	54	0.41	0.50	0	1
Wealth index	54	-1,770,529	489,781.3	-2,612,837	-485,181.7
Mother's education	54	1.89	1.46	1	5
Household size	54	5.87	2.48	1	12
Household income	54	341,666.8	758,932.8	25,000	382,5000
Fish-farming households					
FCS	33	56.01	13.04	31.01	84.5
Fish farming	33	1	0.00	1	1
No of ponds	32	1.78	1.21	1	6
Years of farming	33	7.54	8.48	0	40
Pond size	33	8.07	5.77	1	20
Age	33	47.85	17.84	17	86
Geographic area	33	0.82	0.39	0	1
Sex	33	0.42	0.50	0	1
Wealth index	33	-1,720,552	552,030.1	-2,328,885	-485,818.7
Mother's education	33	1.97	1.51	1	5
Household size	33	6.33	2.56	1	12
Household income	33	487,121.3	942,170.9	25,000	3,825,000
Nonfish-farming households					
FCS	21	58.44	20.92	1	84.5
Fish farming	21	0	0	0	0
Age	21	40.95	14.61	17	60
Geographic area	21	1.15	0.37	1	2
Sex	21	0.38	0.50	0	1
Wealth index	21	-1,849,065	370,837.1	-2,612,837	-927,195.6
Mother's education	21	1.76	1.41	1	5
Household size	21	5.14	2.20	1	10
Household income	21	113,095.3	124,403.4	25,000	425,000.5

Table 5. 2SLS regression results for Ghana.

Variable	Coefficient	Std. Error	z	P > ‖z‖	95% C .I.	
Fish farming	2.70	4.19	0.65	0.52	-5.58	10.98
Geog. area	4.95	3.12	1.57	**0.12***	-1.28	11.13
Age	0.03	0.14	0.21	0.83	-0.25	0.31
HH income	0.00	0.00	4.20	**0.00*****	0.00	0.00
Wealth index	-0.01	0.01	-0.81	0.42	-0.02	0.01
Mother's educ.	0.80	0.32	2.48	**0.01****	0.16	1.44
Household size	-0.26	0.59	-0.43	0.67	-1.44	0.93
Constant	61.68	5.91	10.43	0.00	49.99	73.37

* = 10% significance level, ** = 5% significance level, *** = 1% significance level.

Table 6. Ordinary least squares regression results for Tanzania.

Variable	**Coefficient**	**Std. Error**	**t**	**P > ‖t‖**	**95% C .I.**	
Fish farming	0.30	5.09	0.06	0.954	-9.94	10.53
Geog. area	10.12	5.90	0.71	**0.093***	-1.76	21.99
Age	-0.06	0.15	-0.04	0.966	-0.31	0.29
HH income	-0.00001	4.24e-06	-2.40	**0.020****	-0.00002	-1.66e-06
Wealth index	0.00002	6.49e-06	2.92	**0.005*****	5.91e-06	0.00003
Mother's educ.	1.33	1.72	0.78	0.440	-2.12	4.79
Household size	0.38	1.05	0.36	0.72	-1.73	2.49
Constant	80.30	14.73	5.45	0.000	50.66	109.93

* = 10% significance level, ** = 5% significance level, *** = 1% significance level.