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Synopsis: Transforming Agriculture for Improving Food and Nutrition Security among Nigerian Farm Households

Olivier Ecker, Patrick Hatzenbuehler, and Kristi Mahrt

RESEARCH OVERVIEW

The launch of the Agricultural Transformation Agenda (ATA) by the Nigerian Federal Ministry of Agriculture and Rural Development (FMARD) in 2011 represented a shift in strategy toward increasing the agricultural sector share of the Nigerian economy. The successor FMARD strategy document for 2015-2019, the Agriculture Promotion Policy (APP), encompasses many elements of the ATA and is supportive of a continued emphasis on enhancing government's attention to and support for the agricultural sector.

Given the many Nigerians involved in farming, these adjustments in policymaker focus toward boosting general agricultural development, including targeted initiatives for specific crops and industries, could have substantial effects on livelihoods across Nigeria, especially in terms of farm household planting and consumption decisions. Since much smallholder-produced food is consumed at home rather than sold, such changes would influence dietary intakes and nutrition-related health outcomes.[1] Thus, the goals of this study were to: 1) assess current conditions in the country regarding food insecurity and malnutrition; and, 2) determine if the hypothesized linkages between food consumption and various household characteristics (e.g., agricultural production) and market factors (e.g., prices) are observable in household survey data.

BACKGROUND

Agricultural production and nutrition are linked through multiple household and market level pathways. In an idealized scenario that is consistent with the goals of the ATA and APP, more Nigerian agricultural households would transition from self-subsistence toward a market orientation in their farming. Such a realignment is generally considered to include greater specialization in the crops produced and intensification in the farming methods used, such that farmers focus on the crops they grow most productively and, in doing so, adopt productivity enhancing technologies. With more farm households acting in a similar fashion, production increases in the aggregate.

Additionally, there is a greater reliance on the market for both sales of surplus production and for purchase of food for consumption. These purchase choices can influence dietary intake and nutrition quality. Notably, if a more (less) diverse basket of foods is purchased than was being consumed from a farm's own production, household members may experience more (less) adequate nutrient intake. The extent to which production adjustments occur and those adjustments translate into changes in consumption behavior can be determined empirically, conditional on availability and accuracy of relevant data.

CHILD UNDERNUTRITION IN NIGERIA

A careful assessment of the quality of available child anthropometry data for Nigeria was the first component of the study.

The anthropometry data in two nationally representative surveys were examined: 1) the Demographic and Health Survey (DHS) 2013; and, 2) the post-harvest round of the third wave of the General Household Survey (GHS-W3-PH) 2016. Specifically, the height-for-age z-score (HAZ), weight-for-height z-score (WHZ), and weight-for-age z-score (WAZ), which are, respectively, measures of stunting, wasting, and underweight, were calculated for children in urban and rural households in the samples for the two surveys. An

[1] We focus on child undernutrition since it is associated with reduced cognitive development and other life-long health and well-being effects. Additional references on the linkages between childhood undernutrition and health implications and the complete set of findings from this study are in NSSP Working Paper 56, *Transforming Agriculture for Improving Food and Nutrition Security among Nigerian Farm Households*. http://ebrary.ifpri.org/cdm/singleitem/collection/p15738coll2/id/132881/rec/1.

observation magnitude for any of these measures below -2 may signal that a child suffers negative health effects associated with being stunted, wasted, or underweight.

The results of our estimation yielded similar results to those cited in previous studies. This implies that any error in the estimates of child nutritional status can be ascribed to the underlying data rather than the estimation method. In support of this conjecture, our HAZ, WHZ, and WAZ scores (Table 1) had standard deviations of 2.10, 1.58, and 1.44, respectively. Such large magnitudes for the standard deviations for these z-scores have been found in previous research to indicate severe measurement errors, most plausibly due to poor survey implementation. These apparent errors mean that these data are not suitable for design of food and nutrition security policies.

Table 1. Indicators of young child nutrition status in Nigeria, mean

Child nutrition indicators	Total	Rural	Urban
height-for-age z-score (HAZ)	-1.20 (2.10)	-1.30 (2.19)	-0.99 (1.90)
weight-for-height z-score (WHZ)	-0.23 (1.58)	-0.20 (1.65)	-0.28 (1.43)
weight-for-age z-score (WAZ)	-0.84 (1.44)	-0.89 (1.50)	-0.75 (1.31)

Source: Authors' calculation based on GHS-W3-PH 2016 data.
Figures in parentheses are standard deviations for the estimates.

DETERMINANTS OF HOUSEHOLD DIETARY DIVERSITY

Our investigation of the relationship between food and nutrition security and agricultural production and market-related factors relied on dietary diversity indicators rather than the anthropometry data. Specifically, we estimated the relationships between two dietary diversity indicators – the household food variety score (HFVS) and household dietary diversity score (HDDS) – and farm production diversity indicators and a set of household (e.g., expenditures, as a proxy for income) and market (e.g., prices) variables.

The estimation results for a fixed-effects model (Table 2) show that increasing production diversification, expenditure, and the price of imported rice are associated with greater household dietary diversity variety, while increasing prices of local rice, palm oil, and tomato are associated with less diversified diets.

Table 2. Main estimation results for HFVS

Select explanatory variables	Coefficient estimates
Number of cultivated crops (max = 42)	0.255*** *0.063*
Per capita expenditure	2.504*** *0.178*
Local rice price	-2.100*** *0.758*
Imported rice price	2.008*** *0.666*
Palm oil price	-4.530*** *0.366*
Tomato price	-1.072*** *0.289*

Source: Own estimation, based on GHS-W1 2010-11 and GHS-W3 2015-16 data and NBS food price data.
Note: Only results for select variables are presented due to space limitations. Please refer to the full paper for complete results. ***, **, * signify that an estimate is statistically significant at the 1%, 5%, and 10% levels, respectively. Standard errors (shown in italics) are clustered at the household level.

These results imply that household dietary diversity is affected by both household and market specific factors. Thus, the location-specific food environment, which encompasses both household and market level factors, must be taken into consideration when designing food and nutrition security interventions.

CONCLUSIONS

In the empirical investigations analyzing the quality existing child nutrition data and relationships between household dietary diversity and various household and market factors in Nigeria, two primary discoveries were made:

- Implementation standards of the planned national dietary intake and micronutrient survey for 2019 need to improve on those of prior surveys; and,
- A systems approach is needed to ensure that both agricultural productivity improvement and food and nutrition security goals are achieved simultaneously.

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE | 1201 Eye Street, NW | Washington, DC 20005-3915 USA
T: +1.202.862.5600 | F: +1.202.862.5606 | Email: ifpri@cgiar.org | www.ifpri.org

IFPRI-ABUJA | c/o International Fertilizer Development Center | No.6 Ogbagi Street | Off Oro-Ago Crescent, Garki II | Abuja, Nigeria | Email: ifpri-nigeria@cgiar.org | nssp.ifpri.org

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