

## Using quantitative methods to evaluate mobile phone technology based nutrition and agriculture advisory services in Ghana

This brief focuses on the quantitative impact evaluation in Ghana, led by IFPRI. The service to be delivered and evaluated is the 'Vodafone Farmer Club'. The service is a bundled solution offering agricultural and nutrition information via voice messages, SMS, and a Farmer's Helpline. Agriculture messages are composed of weekly price information, daily weather information, and farming tips, sent three times per month. Nutrition messages are sent one per month with the possibility of increasing to three per month. The evaluation will test whether this approach to making this mobile-phone based agricultural intervention more nutrition sensitive will improve household diets and nutrition.

### Research questions

The quantitative evaluation in Ghana will address the following questions:

1. How effective is the Farmer Club at increasing the knowledge and changing the behaviour of farmers?
2. What are the impacts of the Farmer Club product on household's dietary diversity, agricultural income, and production?
3. What is the demand for the Farmer Club product and can framing affect household's willingness to pay?
4. Does targeting women have differential impacts on knowledge, behaviour and final outcomes compared to targeting men?

### Evaluation design

In order to estimate the causal impact of the Farmer Club product, we will apply a randomised encouragement design. The encouragement design will not restrict access to the Farmer Club product, but instead will work by randomly assigning some communities to receive additional marketing and promotion of the programme.

The additional marketing and promotion to encourage take-up and continued use is a combination of price discounts, SMS blasts, and door-to-door marketing to farmers in selected communities throughout the evaluation period. The free door-to-door marketing, will include a short advertisement script on the value added of the service that is randomly targeted to either a male or female from each household. Households will randomly receive one of two scripts:

mNutrition is a global initiative that uses mobile phone technology and mobile phone based behaviour change messages to improve the health and nutritional status of children and adults in the developing world. mNutrition is supported by DFID, organised by GSMA, and implemented by in-country mobile network operators (MNOs) in many countries in Sub-Saharan Africa and South East Asia. The evaluation of the mNutrition initiative is being led by the Institute of Development Studies (IDS) together with GAMOS and the International Food Policy Research Institute (IFPRI) as part of the e-Pact consortium led by Oxford Policy Management (OPM), co-managed with Itad. The consortium is using a mixed-methods approach, which includes qualitative, quantitative and business analysis components to evaluate two programmes, Ghana mAgri and Tanzania mHealth. The aim of the impact evaluation is to estimate the impact of mNutrition on children and adults and to understand how the context and the components of the intervention shape its impact.

1) a script that focuses on the agriculture value added of the product (Vodafone's current script), or 2) a script that focuses on the agriculture and nutrition value added of the product.

Assignment to the different intervention groups occurred in two stages. The first stage randomly assigned EAs to either the comparison group (Group 1) or encouraged group (Group 2). The second stage randomly assigned households in the encouraged EAs to the following four groups: a) targeted male, agriculture script; b) targeted male, agriculture and nutrition script; c) targeted female, agriculture script; d) targeted female, agriculture and nutrition script.

Because the encouragement was randomly assigned, we will use the systematic variation in take-up of the product to measure the causal impact of the programme. The estimation methodology will compare differences in outcomes of interest across the comparison and encouraged groups and within the different encouraged groups, using data collected in baseline and endline surveys. The baseline survey was conducted in March-April 2017, before the extra encouragement was implemented and the endline survey will occur two years after the baseline. To estimate the impact of the Farmer Club product, we will use a combination of analysis of covariance (ANCOVA), single difference and double difference techniques, depending on the outcome of interest.

The primary outcomes of interest are those related to GSMA's stated goals:

1. Household and women's dietary diversity;
2. Agricultural productivity;
3. Agricultural income.

Secondary outcomes include a large set of variables to measure (1) intermediate outcomes, such as nutrition knowledge and behaviour and knowledge and practice of farming techniques, and (2) factors that affect take-up and use of the product. Data on nutrition knowledge and behaviour and farming knowledge and behaviour was collected separately for males and females within the same household to analyse differences across gender. We will also collect information on an individual's willingness to pay for the Farmer Club service using the Becker-DeGroot-Marschak (BDM)<sup>1</sup> method.

## Data collection and sampling strategy

The study takes place in five districts in the Upper West Region and five in the Central Region, across 207 EAs (104 in the encouragement arm and 103 in the comparison arm). In each EA we randomly sampled 19 farmer households, for a total sample of 3,933 households at baseline<sup>2</sup>. The inclusion criteria into the sample are that households must: 1) be a farming household; 2) own a mobile phone; 3) not be a current member of Farmer Club; and 4) have at least one female member age 15-60 years old. The last criterion ensures that we can measure woman's dietary diversity (a primary outcome), in all our sample households. In order to know which households meet our sampling criteria, a census in our selected enumeration areas was conducted. The census also allows us to calculate current take up rates of the Farmer Club in each enumeration area before the start of the encouragement.

<sup>1</sup> See- Berry, James and Fischer, Greg and Guiteras, Raymond P., Eliciting and Utilizing Willingness to Pay: Evidence from Field Trials in Northern Ghana (July 2015). CEPR Discussion Paper No. DP10703. Available at SSRN: <https://ssrn.com/abstract=2630151>.

<sup>2</sup> Sample size is based on power calculations to detect meaningful impacts on women's dietary diversity and cocoa yields.

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## Find out more

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This project is being led by the Institute of Development Studies (IDS) as part of the e-Pact consortium led by Oxford Policy Management (OPM) co-managed with Itad. The IDS Project Manager is Jessica Gordon [[j.gordon@ids.ac.uk](mailto:j.gordon@ids.ac.uk)]. For further information about the project please contact [mnutrition@ids.ac.uk](mailto:mnutrition@ids.ac.uk). The contact point for the client is Louise Horner [[l-horner@dfid.gov.uk](mailto:l-horner@dfid.gov.uk)]. The client reference number for the project is PO6420.

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