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Research Report

Sustainable total sanitation - Nigeria: First SanMark impact evaluation report

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Sustainable total sanitation – Nigeria first SanMark impact evaluation report

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Sustainable Total Sanitation – Nigeria

First SanMark Impact Evaluation Report

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Preface

This report is part of the formal research component of WaterAid's "Sustainable Total Sanitation in Nigeria" (STS Nigeria) project, funded by the Bill & Melinda Gates Foundation. Additional funding from the Economic and Social Research Council (ESRC) Centre for Microeconomic Analysis of Public Policy (CPP) is also gratefully acknowledged. The views expressed in this report are, however, those of the authors and not necessarily those of the funders. Neither are the views expressed necessarily those of the other individuals or institutions mentioned here, including the Institute for Fiscal Studies (IFS), which has no corporate view.

Data were collected in collaboration with Indepth Precision Consult (IPC), based in Abuja, Nigeria. IPC bears no responsibility for the interpretation of the data in this report. All respondents agreed to participate in the surveys, and were assured of the confidentiality of any identifying information gathered. The University College London Ethics Review Board and the National Health Research Ethics Committee of Nigeria have approved this study.

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Executive Summary

In this report, we focus on understanding the context for the Sanitation Marketing (SanMark) intervention and potential initial impacts, after its gradual development and roll-out to selected treatment areas in the Nigerian states of Ekiti and Enugu. We consider SanMark to be composed of two main phases: (i) direct work with targeted businesses to help them produce and sell a new sanitation product, as well as the provision of basic business skills training; (ii) village level door-to-door (D2D) marketing activities, to increase awareness among households of the new sanitation product and places where this could be sourced from, together with market level events and other marketing activities. At the time of collecting the latest round of data, the first component had been mostly developed and implemented, while the second was starting to be rolled out. We report our findings from analysing data collected as part of a supplier survey and as part of a second short follow-up survey on households, both carried out during April 2017. The intervention was piloted in the state of Igbo Eze North between September 2015 and February 2016. Since then, WaterAid staff have worked closely with two suppliers in this LGA.

- Both suppliers have sold Water Easy Toilets (WETs) in the past, and currently offer them to their customers.
- Both suppliers have invested in additional metal moulds for specific components of the WET product line.
- One of the suppliers reports that they sell eight WET units every month, adding up to around US\$400 in monthly sales from these products only. During the same period, average monthly sales from all the suppliers in our sample were equal to US\$2,200. This supplier has also introduced innovations into the WET product line.

In the rest of our study sample, 60 suppliers were randomly selected into SanMark following a randomised controlled trial (RCT) design, and the work with compliant businesses began in September 2016. From this study sample, we find the following.

- Of the 60 suppliers selected into SanMark, 31 attended at least part of the training and 36 report that they have heard of or seen the WET product.
- Awareness of WET products is just as high among control suppliers: 40 out of 69 have heard of or seen the WET products.
- However, just seven SanMark suppliers offer WET products to customers, and only three of them declare that they sell WET products in a typical month.

To further understand this gap between supplier awareness and WET sales, we look at households in our study area and we find the following.

- Only 7% of the households in our sample have heard of or seen WET products, and this low awareness might be limiting sales growth.

- Of the households who knew about the WET product, 80% said it fared better than other products in the market in terms of safety, water efficiency and aesthetic appeal. While this does not explain the gap between supplier awareness and sales, it suggests that there is the potential to increase sales with the introduction of D2D sales agents.

One should note that these findings were contemporaneous to the collapse in international oil prices, which started in 2014, and from which the Nigerian economy is still struggling to recover. Quantities of bricks sold by the suppliers in our sample fell by an average 40% over the course of 2015, and have only increased by 3% since then.

1. Introduction

In this report, we analyse the progress of WaterAid UK's Project 'Sustainable Total Sanitation Nigeria – implementation, learning, research, and influence on practice and policy' (STS Nigeria). This report is part of the project's Formal Research Component and is a follow-up to two previous reports (Abramovsky et al. 2015, 2016). We focus on understanding the context for the SanMark intervention and potential initial impacts, after its gradual development and roll-out to selected treatment areas in the Nigerian states of Ekiti and Enugu. SanMark is a complex and multi-pronged intervention. Two phases are explored within this research report: (i) direct work with targeted businesses to help them produce and sell a new sanitation product, as well as the provision of basic business skills training; (ii) village-level D2D marketing activities, to increase awareness among households of the new sanitation product and places where this could be sourced from, together with market level events and other marketing activities. At the time of collecting the latest round of data, the first component had been mostly developed and implemented. We report our findings from analysing data collected as part of a supplier (or business)¹ survey and a second short follow-up survey (or so-called rapid assessment) on households, both carried out during April 2017. The data collection, analysis and writing of this report have been carried out by the Institute for Fiscal Studies (IFS) in collaboration with Indepth Precision Consulting, and with input from WaterAid UK and WaterAid Nigeria.

In a preceding report (Abramovsky et al. 2016), we documented the main characteristics of the suppliers in our sample, and we described the research design and our empirical strategy. In this report, we discuss the findings from the first round of data collected since the implementation of the first component of the SanMark intervention was conducted (i.e. the training of businesses to supply a new sanitation solution to households in the study area). We show that, while the programme impacts of this first SanMark component are still hard to observe at this very early stage, there is significant potential for future impacts, given that the remaining component (D2D visits and marketing activities) had not yet been implemented. We also show that while awareness of the WET, the new product introduced as part of the SanMark programme, is high amongst suppliers, just seven of them are actually selling these on a regular basis. This divergence may be explained by the low awareness about WET products that can be observed among the households in our sample.

The second component of the SanMark intervention was designed to address this lack of awareness at the household level. It involves the recruitment, training and deployment of D2D sales agents to promote WET products. For evaluation purposes, the activities were planned only in randomly selected areas. They were being rolled out at the same time as this last round of data was collected. Therefore, the present report shows the results of SanMark's first phase only. The overall causal impacts from the SanMark intervention will be more appropriately measured by the time of the endline survey, to be conducted in October 2017.

¹ Throughout this report, the terms supplier(s) and business(es) will be used interchangeably.

The remainder of this report describes these findings in more detail. Before showing the analysis results, in Section 2, we describe the SanMark intervention that was implemented in the study areas as well as the methodology that underlies this report. In Section 3, we discuss the initial findings from the implementation of SanMark's first phase, and we explore some initial impacts on awareness of WET products among suppliers and households. We conclude in Section 4.

2. SanMark and Research Design

2.1 The SanMark intervention

The STS Nigeria project aims at tackling the toilet ownership gap by addressing both demand and supply constraints. An accompanying report (Abramovsky et al. 2017) covers the impacts of an intervention directed at increasing toilet demand by households through an information and mobilisation campaign, in particular through Community Led Total Sanitation (CLTS). However, SanMark, the intervention discussed in this report, was designed to focus on the constraints on the supply side using the smart design of new sanitation solutions and marketing strategies. The design of the SanMark intervention was developed by WaterAid in Nigeria and inspired by strategies that have been shown to be successful in other parts of the world; see, for example, Mara et al. (2010). Its development went through a number of stages in order to tailor the approach to the local market. The baseline report (Abramovsky et al. 2015) gives more detail on the design stages. It included, for example, an abridged formative research, or 'deep-dive' exercise, meant to identify the desired sanitation product by the targeted market, to gather insights into the drivers of demand for sanitation and current blockages to sanitation, and to achieve a greater understanding of some of the misconceptions of what communities desire and aspire to, when moving from open defecation to a private toilet. In this report, we focus on the resulting intervention components, which were piloted between September/October 2015 and February 2016, and partly implemented in their final form between September 2016 and March 2017, in all study areas. Details of the piloting exercise can be found in Abramovsky et al. (2016).

For the purpose of this report, SanMark, consists of two main phases: a first phase directed at suppliers, and a second consisting of market- and household-level activities, directed at consumers. The supplier phase of SanMark consisted of the following.

1. *Entry point.* As a first step, the SanMark team and the Water, Sanitation and Hygiene (WASH) coordinator for the Local Government Authority (LGA) carried out a familiarisation visit to each SanMark village, before introducing the intervention to the traditional rulers.² This introduction served the purpose of gaining buy-in, discussing the planned intervention strategy within the ruler's community and appealing for their support for the programme. The team also explained the RCT design used in the impact evaluation and, in particular, the implication that not all suppliers in each community will be able to participate in SanMark.
2. *Approach.* Suppliers in our sample that produce cement blocks, and were assigned (randomly) into SanMark, were approached by the SanMark team and/or the LGA WASH coordinator. The programme was explained and the supplier was invited to a pitching session.³ During this session, suppliers received a Personal Entrepreneurial Competency test, which is only for private purposes (they do not

² WASH units are government divisions at the LGA level, supported financially by WaterAid Nigeria as part of the STS Project. See Abramovsky et al. (2015) for more details.

³ The randomisation of suppliers in and out of the SanMark intervention was described more extensively in Abramovsky et al. (2016).

- need to reveal their score to the organisers). The SanMark programme was explained and suppliers were invited to a subsequent training session.
3. *Product development session.* A master trainer described the quantities and qualities of materials needed in the construction of each WET component that makes up the dual set model.⁴ The steps required for installation of each of the models were discussed, as well as the advantages that WET models offer over other options in the market. Hands-on training sessions were carried out, during which participating producers went through these steps themselves. Examples of three common WET models can be seen in Figure 2.1.
 4. *Business development services training.* Business training sessions were held, with business development consultants focusing on basic business management skills, such as costing, pricing and record keeping, as well as training in using data that can help determine demand in surrounding communities. These sessions were followed by regular visits by WaterAid staff to provide on-the-spot, basic business problem diagnosis and to recommend solutions.
 5. *Continued support to SanMark businesses.* After participating in the training and being introduced to the WET product, SanMark businesses were offered free access to a metal mould set for the WET dual set model, which includes the offset and direct pit components. Suppliers did not own the moulds but borrowed them from WaterAid staff whenever they needed one, and these were retrieved if unused. WaterAid Nigeria estimates that the market value of this mould is US\$400, a large investment for control suppliers in case they would want to replicate it. More importantly, SanMark businesses can purchase SaTo pans (the plastic component of WET products) from WaterAid Nigeria staff. These pans are not produced in Nigeria yet, and WaterAid are the only importers of these in the area of study. The cost of each pan for suppliers at the time of writing this report was NGN 1,000, around US\$3.⁵ Control suppliers may not purchase SaTo pans. The mould and SaTo pan are illustrated in Figure 2.2.

The second phase of SanMark is directed at households and consists of the following.

6. *Market promotion.* With support from a creative agency, WaterAid developed promotional and marketing materials to advertise the products that have been developed (the WET) and to test the emerging business model for sanitation marketing in the project communities. This creative process defined the typical person to target as well as the key messages and touch points to deliver the messages. Below-the-line marketing was identified as appropriate for the context, focusing on interpersonal communications, direct consumer contact, road shows

⁴ The master trainer is a skilled building expert (e.g. an engineer) with good knowledge of concrete mixtures and consistency, quantity, cost and quality of materials required to produce WET products. The master trainer also understands and can interpret the drawing and installation process. The first master trainer witnessed the initial product development process, and was supported by an international expert. At the time of writing this report, one of the pilot suppliers has become a master trainer due to his skills and understanding of the process. Master trainers are expected to train other suppliers selected to participate in the programme.

⁵ This price was set by WaterAid Nigeria staff and was based on a realistic estimate of what the SaTo pan would cost if available in Nigeria. It used benchmarks from other markets, such as Bangladesh and Cambodia, and was meant to simulate a 'real market price'.

and other market-level events. These were delivered through the one-stop shop and D2D sales agents working on commission.

7. *Recruitment and training of D2D agents.* D2D sales agents were recruited from SanMark villages. Their role is to visit households and to provide information on the characteristics of the WET toilet, in order to encourage them to improve their sanitation. They connect households with SanMark suppliers that offer WET products, and they work on commission from the suppliers, the amount of which is to be negotiated among the parties directly (i.e. without support or influence from either WaterAid or WASH unit staff).
8. *Market level activities.* D2D sales agents were also involved in the organisation and implementation of village-level marketing activities, carried out in public areas, mostly local markets, to raise the profile of WET products and to promote their advantages. The training introduced the product line and the product components, a suggested pricing formula, pitching techniques, and the use of promotional materials, documentation of pitching and outcomes (including the use of a sales tracker). During training, D2D agents practised both individual and group pitching of the WET product.

This second phase was in the process of being fielded at the time of the data collection exercise (April 2017) underlying this report. The training of facilitators, who were LGA officials, was carried out in December 2016, and the recruitment and training of D2D agents was conducted between February and April 2017. The first market-level events run by these agents occurred between the end of March and mid-April 2017. Both the activities of D2D sales agents and marketing events are planned to continue until October 2017. Therefore, this report will document the impacts of the first phase, while the impacts of the second will be measured at endline, in October 2017.⁶

An important trait of the SanMark intervention worth noting is that it is directed at both concrete block producers (CBPs; phase 1) and households (phase 2). For this reason, our research design implied the random assignment of both suppliers and households to either SanMark or control groups.⁷

⁶ These components have been slightly modified since Abramovsky et al. (2016) and are therefore not identical to the description provided at that time. The above list reflects the final version implemented in our study areas.

⁷ Details on this can be found Abramovsky et al. (2015, 2016). This report will delve into the potential nascent impacts of SanMark on both of these populations at this very early stage.

Figure 2.1. WET models.



(a) Direct pit model



(b) Offset model



(c) Dual set model (offset + direct pit)

Source: WaterAid Nigeria.

Figure 2.2. Components of WET models.



(a) Offset component of the WET metal mould

Source: WaterAid Nigeria.



(b) A SaTo pan

2.2 The experiment – supplier-level SanMark activities

Survey round (SanMark suppliers)

At the time of writing this report, four survey rounds of supplier interviews had been conducted. Figure 2.3 plots data collection waves (marked in green) together with the timing of implementation of both SanMark phases (marked in yellow).

1. SR1 (April/May 2014). This data collection round targeted all businesses in the study area that sold sanitation-related products, such as concrete bricks, slabs, cement, concrete, PVC products and ceramic toilet pans (in this sense, it was considered a census). As part of this first wave, we interviewed a total of 155 businesses. Of these, 128 produced concrete blocks, and these businesses became our sample of interest.⁸
2. SR2 (December 2014). This survey was collected alongside the collection of the first household survey, which constitutes the baseline for the impact evaluation of the CLTS intervention that aims to mobilise demand for sanitation.
3. SR3 (December 2015). This survey was collected alongside a short follow-up survey of households (the so-called first rapid assessment) to assess the short-run impact of the CLTS. This survey constitutes the last interview with suppliers before SanMark was introduced to businesses in the study area, and therefore it serves as a baseline for SanMark.⁹
4. SR4 (April 2017). This survey was collected alongside a second short follow-up survey of households to explore the longer-run impact of the CLTS as well as the initial awareness of the new WET products introduced by SanMark.

Figure 2.3. Timeline of SanMark data collection and implementation.



⁸ We focused on CBPs in particular because the construction of WET models requires the same materials and skills as those involved in the making of concrete blocks.

⁹ After this round, but before SR4, an intermediate desk review and a revalidation survey were carried out in response to prospective investors in the SaTo pan. It aimed to ascertain the number of businesses still in active and the number of new businesses, and it also included a random viability testing of the WET products, when available. However, this was not part of our formal research data collection exercises.

The earlier rounds of data (SR1 and SR2) are useful in our analysis over a number of dimensions, including the following.

- The very first survey was designed to gain an understanding of the markets in which these suppliers operate. We found that suppliers operate in connected markets that cannot be divided into isolated segments, and this has important implications for our research design. For more details on this, see Abramovsky et al. (2015).
- Our analysis looks at several business performance outcomes, such as revenues, costs and product variety. As noted in McKenzie (2012), indicators of this nature usually contain significant amounts of measurement noise, given their high daily or monthly variation. By interviewing these firms several times before and after the programme, and by looking at average values, we obtain a more precise impression of their overall performance.
- These rounds provide an insight into the dynamics of business set-up and closure in our study area. As we describe below, we observe a relatively high entry and exit of suppliers into the sample. We designed the surveys to gain a deeper insight into this process, for example, administering a specific questionnaire to businesses that closed operations between survey rounds.
- As described in Abramovsky et al. (2016), the random allocation of suppliers to treatment and control does not give us a completely clean identification strategy of SanMark impacts on suppliers, given that both treatment and control suppliers are operating in the same markets. However, we can exploit the longitudinal panel data to apply a difference-in-difference approach, combined with a wide range of control variables and a set of assumptions, to learn about the intervention's impacts.

Sample size (SanMark suppliers)

Table 2.1 shows the total number of businesses interviewed in each of these survey rounds, as well as the size of our SanMark and control groups.

After the SanMark baseline survey (SR3), the last survey round before the start of the SanMark intervention, we randomly assigned all successfully interviewed CBPs in our SR3 sample to either SanMark or control groups. We stratified this process by LGA. If an LGA had an odd number of CBPs operating within it, the remainder – after dividing into two identically sized groups – was assigned to control. This resulted in our study sample of 129 CBPs, composed of 60 assigned to SanMark and 69 to the control group, as seen in panel A of Table 2.1.

In this randomisation, we included ten suppliers that were recorded as CBPs in the first two survey rounds but appeared to be out of business. Of these, eight were assigned to SanMark and two to the control group, as seen in the *'Inactive'* rows below the SanMark and control categories in Table 2.1. Given the high rate of entry and exit in the sector, and the possibility of these businesses re-entering in successive survey rounds, we chose to include these inactive but eligible suppliers in the randomisation. It seems to be a common phenomenon in our study areas for people to run their business only during certain periods in the year. These suppliers are then considered *'inactive'* when not in business. By SR4, four of these suppliers (all assigned to SanMark) were back in business and were interviewed successfully. As a result, eight of the 12 closed SanMark CBPs at SR4 are new closures, and four were existing closed businesses by SR3. Similarly, the total

number of closed businesses in the control group by SR4 is composed of two existing closed businesses and eight new closures. The balanced rate of closures between SR3 and SR4 across treatment groups is an informative finding that we discuss at greater length below.

Table 2.1. Number of suppliers interviewed in each survey round.

	SR3 Dec 2015	SR4 Apr 2017	SR1-SR4 All four rounds
Panel A: study sample – CBPs			
SanMark	60	60	49
<i>Active</i>	52	48	
<i>Inactive</i>	8	12	
Control	69	69	54
<i>Active</i>	67	59	
<i>Inactive</i>	2	10	
Total study sample	129	129	103
Panel B: not in study sample			
CBPs unassigned to SanMark or control	12	23	10
<i>Refused interview at SR3</i>	6	6	
<i>From Igbo Eze North (piloting)</i>	6	6	
<i>New CBPs at SR4</i>		11	
Non-CBPs	57	46	35
<i>Active</i>	43	33	
<i>Inactive</i>	14	13	
Not in study sample	69	69	45
Total number of observations	198	198	148

Note: The SanMark intervention was carried out between January 2016 and April 2017.

Source: Second pre-SanMark questionnaire (Dec 2015) and first post-SanMark questionnaire (Apr 2017).

The rest of the interviews were conducted with 56 suppliers that were not included in the randomisation in SR3. At SR3, this second part of our sample was composed of 12 CBPs excluded from the randomisation, and 57 suppliers that did not sell concrete blocks but operated in related sectors. Among the excluded CBPs, six of them were considered not to be eligible because they refused to be interviewed at SR3, as seen in the row titled '*Refused interview at SR3*', in Table 2.1. These businesses were approached on three separate occasions, and each time denied our request for an interview.¹⁰ They were therefore considered to be non-cooperative, as we assumed that they would not cooperate in successive survey rounds either, and they were dropped from the randomisation. During SR4, five of these suppliers were successfully interviewed, while only one of them declined our request. This suggests that, in the future, non-cooperation should also be considered as a temporary condition. For the purposes of our analysis, however, these six businesses were not part of our study sample.

¹⁰ They were classified as CBPs given their line of business in SR1 and SR2.

Also excluded from the randomisation were six CBPs located in the LGA of Igbo Eze North. These suppliers began the SanMark intervention almost six months before the rest of the sample, because SanMark was piloted in this area (see Section 3.1). During this piloting stage, several components of the intervention were streamlined according to local market conditions, so these suppliers received a different, unfinished, treatment. Because of the unique nature of the SanMark treatment received by these suppliers, and because the number of eligible producers from which to create both SanMark and control samples in this LGA was too small from the start, we decided to remove the six CBPs operating in the LGA of Igbo Eze North from our study sample. Finally, we also encountered 11 businesses that did not sell concrete blocks at SR3; these were not assigned to any treatment group, but they were then declared to operate in the CBP sector by SR4.

However, the largest component of our non-study sample consists of non-CBP businesses, which operate in industries that are related to the sanitation sector, and do not involve concrete block production. In December 2015, 57 businesses were interviewed as part of this group, and 46 businesses were part of it by April 2017 (11 of these started producing concrete blocks and were therefore moved to the unassigned, CBP category). They include, for example, small and medium sand and cement distributors, suppliers of PVC and iron materials, and suppliers of other concrete products used in toilet construction, such as round slabs. Non-CBP producers include both active and closed businesses as of SR3. Of the 14 businesses surveyed that were found to be inactive during SR3, six were re-activated in SR4. This means that we have five new closures at SR4. Thus, we obtain the total of 13 inactive non-CBPs, as seen in the second column of Table 2.1. Although non-CBP suppliers were not assigned to SanMark or control, this non-study sample remains an interesting component of our research, particularly because it allows us to observe these types of market dynamics, which we aim to explore further in a subsequent report.

Between SR2 and SR3, 50 additional suppliers were found to be operating in our area of study, and were added to our sample (see Abramovsky et al. 2016). The third column of Table 2.1 shows the number of suppliers that were approached in all four rounds of data collection. Of the 129 businesses in our study sample, 103 of them (54 from control and 49 from SanMark) were successfully interviewed in all four rounds of data collection. Ten CBPs not assigned to treatment or control and 35 non-CBPs were also approached in the four survey waves, meaning we have a complete panel of 148 businesses.

Figures A.2 and A.3 in the Appendix plot the locations of the SanMark and control communities in the states of Enugu and Ekiti, respectively. Similarly, Figures A.4 and A.5 plot the locations of SanMark and control CBPs, as well as the location of the suppliers in our survey that are not included in our study sample.

Attrition (SanMark suppliers)

We now turn to the levels of attrition in our final SanMark study sample of 129 CBPs that were randomly assigned to either SanMark or control, and we explore whether attrition is related to treatment or not. Table 2.2 shows the different interview outcomes in our study sample during SR4 (i.e. the first SanMark follow-up survey). The interviews lasted an average of 45 minutes and participants were not compensated for their time in any way. Suppliers were approached up to three times in order to accommodate their preference for the time of the interview. However, if the interview was refused or if the supplier was

not available on the third visit, then the interview was not conducted. Another possible reason for not having data on suppliers is the failure or closure of a business. It is necessary to analyse carefully the reasons for attrition – refusal, non-availability or market exit – in order to determine any potential threat to the evaluation design and the ability to make causal, generalisable inferences. The problem arises in particular if differential attrition between treatment and control observations is observed.

In our study, at SR4, 112 out of the 129 businesses randomised into SanMark and control groups answered the questionnaire completely. Of these, 62 were from the control group and 50 were from the SanMark group, representing 90% and 83% of the respective samples. Additionally, two suppliers in the control group and one in the SanMark group answered the questionnaire incompletely. This means that the share of control suppliers who refused to answer (third row in Table 2.2) or were not available (fourth row) was 7% (or five suppliers). In the SanMark group, this share was slightly higher (i.e. 13%, or eight suppliers).

Table 2.2. Interview outcomes at SR4 by treatment group.

	Enugu		Ekiti		All		N
	C	C-T	C	C-T	C	C-T	
Interview outcomes							
Complete (%)	94.44	6.94	88.24	6.42	89.86	6.52	129
Incomplete (%)	5.56	5.56	1.96	-0.31	2.90	1.23	129
Refused (%)	0.00	-6.25	1.96	1.96	1.45	-0.22	129
Away, not available (%)	0	-6.25	7.84	-8.07	5.80	-7.54	129
Entry and exit							
New CBPs							11
No longer CBPs	1	-1	2	0	3	-1	7
Closed business	4	1	6	-3	10	-2	22

Note: C stands for control suppliers, T denotes SanMark suppliers and *N* shows the total number of suppliers in each row. The total number of eligible CBPs is 129. New CBPs are producers that have entered the CBP business between SR3 and SR4, and are therefore not part of our SanMark and control groups. 'No longer CBPs' denotes suppliers that have stopped selling cement block products between SR3 and SR4 but are still operative. There are no statistically significant differences between the groups.

Source: SR4.

The bottom panel of Table 2.2 shows information about the number of suppliers in our sample that entered or exited the CBP business, split by treatment and control suppliers.¹¹ The row titled 'New CBPs' shows the number of businesses that were non-CBP in SR3 and that started producing concrete blocks between SR3 and SR4. These suppliers are not formally part of our study and were not assigned to the SanMark or control groups. Nonetheless, the fact that some businesses are entering the CBP sector (11 across both states, i.e. four in Enugu and seven in Ekiti) is an interesting finding in itself. At the same time, seven suppliers left the CBP sector between SR3 and SR4, three of them formerly control CBPs and four of them SanMark CBPs. This suggests that SanMark is not

¹¹ Any supplier declaring that they sell positive amounts of solid, hollow or fancy cement blocks of any size during SR4 are considered to be CBPs in this period.

encouraging exit asymmetrically. Finally, we have a total of 22 confirmed business closures that are also balanced across treatment groups.

We next test more formally if there is asymmetric attrition between our treatment and control samples in a regression set-up, and conditional on observable characteristics of the suppliers. To do this, we perform a regression analysis, and we control for LGA fixed effects and business characteristics using the following specification:

$$(1) \text{Attrition}_{ig} = \alpha + \gamma \text{SanMark}_i + X_i' \beta + \delta_g + \epsilon_{ig}.$$

Here, Attrition_{ig} is an indicator variable equal to 1 if supplier i from LGA g is missing in the SR4 sample. We use different definitions of Attrition_{ig} , to check separately for attrition caused by either refusal/non-availability or business closures, and finally for any of the two reasons. SanMark is a variable indicating whether supplier i belongs to the SanMark group, X_i is a vector of business characteristics and δ_g are LGA fixed effects. Asymmetric attrition means that treatment status has predictive power in explaining attrition between SR3 and SR4, and it will therefore show up as a statistically significant point estimate for the coefficient for treatment status, γ . If treatment status correlates significantly with Attrition_{ig} , then bias is introduced into the sample and additional statistical techniques have to be applied in the following analysis to account for this and to carry out meaningful inference.

Table 2.3. Regression results for attrition in supplier sample at SR4.

Dependent variable:	Refused or N/A		Closed		Any attrition	
	(1)	(2)	(3)	(4)	(5)	(6)
SanMark treatment status	0.02 (0.03)	0.03 (0.04)	0.06 (0.07)	0.04 (0.08)	0.08 (0.07)	0.07 (0.08)
LGA FEs	Yes	Yes	Yes	Yes	Yes	Yes
Business characteristics	No	Yes	No	Yes	No	Yes
Attrition rate (control)	0.03	0.04	0.14	0.13	0.17	0.16
<i>p</i> -value for <i>F</i> -test on covariates		0.27		0.06		0.01
Number of observations	129	102	129	102	129	102

Note: Estimation results from regressions with attrition at SR4 as the dependent variable, and treatment status as the main coefficient of interest. Columns 1 and 2 consider attrition due to refusal or businesses that we were not able to locate at SR4. Columns 3 and 4 consider attrition due to business closure. Columns 5 and 6 combine both sources of attrition. Supplier characteristics measured at SR3. Business characteristics include: firm age; number of full-time employees; a dummy equal to 1 if the firm is registered; use of an electric generator, cell phones and Internet; access to clean water; whether the firm owns a means of transport; whether customers pick up their products; and whether households are the main customers. The row '*p*-value for *F*-test on covariates' shows the result of a test for joint significance of the set of firm characteristics in predicting each type of attrition. Stars indicate statistical significance: * 10%, ** 5% and *** 1%.

Table 2.3 presents the results of these regressions. For clarity, we only present the estimates for our coefficient of interest, treatment status γ in equation 1. The rows labelled 'LGA FEs' and 'Business characteristics' indicate whether LGA fixed effects and supplier characteristics were included in the regression. The estimated coefficients are small and not statistically significant in any of the specifications, meaning that treatment status did not correlate with attrition. Columns 2, 4 and 6 include business-level controls

and therefore are estimated from a smaller sample, given that we have missing age and size data for 27 businesses in our study sample.

Control suppliers are not compensated in any way for their participation, while SanMark suppliers might see their collaboration with the survey as part of the cost of participation in SanMark.¹² Thus, we might expect higher attrition levels among the control group, and a negative and significant estimate of γ . It is reassuring that we do not observe this in our sample, and that our estimates of γ are not significantly different from zero.

A second point of interest from Table 2.3 is the row labelled '*p*-value for *F*-test on covariates', which tests the joint significance of treatment status and a series of business characteristics in explaining the different sources of attrition. Values below 0.10 indicate that belonging to SanMark or control groups and business characteristics are jointly significant to the 10% level in predicting attrition. Looking at this row, from Column 2, we see that these variables do not predict attrition by refusal or non-availability (*p*-value = 0.27), which reassures us about the representativeness of our sample. Column 4 of the same row shows a *p*-value of 0.06, meaning that we can reject the hypothesis that covariates do not predict closures to a 6% level of confidence. This is mostly driven by the explanatory power of firm age, i.e. older firms are more likely to close (not shown).

The evidence discussed in this section has shown that attrition at SR4 was balanced across the SanMark and control groups.

SanMark uptake in the study sample of suppliers

As expected with training programmes at the firm or individual level, not all businesses that were approached agreed to participate in the SanMark intervention, something commonly referred to in the economics literature as incomplete take-up. Out of the 16 SanMark suppliers from the state of Enugu, 12 were found to still be active during the roll-out of the intervention, and 10 agreed to participate in the training sessions. This represents a take-up rate of 83%, if measured as a share of the active suppliers at the time.¹³ The share of SanMark businesses found to be active in Ekiti (i.e. 32 out of the original 44 SanMark CBPs in the state) is in line with what was observed in Enugu. Programme take-up rates were slightly lower: 23 out of these 32 were trained, which is a 72% take-up rate if measured as a share of active businesses. Our overall take-up rate is therefore 75% (i.e. 33 out of 44 active SanMark suppliers in our study sample). This rate is significantly higher than the rate we obtained in Igbo Eze North, our piloting area, where out of six suppliers approached, only two agreed to participate.

While incomplete take-up does not harm our research design, we must be careful to interpret impact coefficients appropriately. As in our evaluation of the CLTS programme, because not all the units we assigned to treatment actually took it up, we will be

¹² This is not certainly the case. Suppliers are free to refuse interviews and this does not affect their affiliation to the SanMark intervention. Indeed, interviews were carried out by an independent data collection agency, not associated with WaterAid. Nonetheless, the association between interviews and SanMark by suppliers cannot be discarded, which is why we were concerned about response rates in the control group.

¹³ Of the four businesses who were not active, two of them were still closed by SR4, while the remaining two had gone back to business, meaning that they could potentially be approached in future phases of the intervention (these are not planned yet).

estimating intention-to-treat (ITT) effects, not actual treatment effects. In other words, we will be measuring the impact of being selected to participate in SanMark, not the impacts of actually participating.

2.3 The experiment: household- and village-level SanMark activities

The second phase of the SanMark intervention, as described in point 6 of Section 2.1, involves the recruitment, training and deployment of D2D salespeople from selected areas in our household study sample. In order to measure the impacts of this phase on household-level toilet uptake, we use a cluster-randomised research design. As we did in the case of the CBPs, we randomly assigned half of our sample of households to SanMark and half to a control group. This means that although D2D salespeople are allowed to canvas any households they choose, they should in principle only do so in the selected treatment SanMark areas. Within the intervention, the recruitment of D2D agents was carried out only in SanMark areas. Additionally, marketing events for WET products being sold by SanMark suppliers, which were organised by WaterAid and WASH unit teams, were only carried out in SanMark areas in our sample.

Randomisation of areas to SanMark D2D activities was carried out after the first household RA and before RA2, and was conducted at the triggerable unit level, a geographical cluster smaller than settlements and autonomous communities, which is composed of one or more villages. We stratified this randomisation at the LGA and CLTS treatment status levels, in order to balance the numbers of both SanMark and control suppliers in each area. The objective is to be able to shed light on the interaction between SanMark and CLTS in affecting household take-up of sanitation.¹⁴ RA2 is the first wave of household data since the SanMark intervention began.

Details on the timeline of the different household data collection waves can be found in the accompanying report (Abramovsky et al. 2017).

Attrition (households in SanMark communities)

Here we discuss the level of attrition in the latest household survey round and we check whether this was balanced across SanMark treatment groups. As in the case for suppliers, we use a regression to test whether the treatment group can predict household attrition from our sample in a statistically significant way. We include household characteristics to control for observable differences among them.

Table 2.4 presents the results of this analysis. Attrition rates among control and SanMark households during our last survey wave were 10% and 8%, respectively, and the difference between them is not statistically significant. This means that attrition is not significantly

¹⁴ There are three kinds of CLTS treatment status areas in our sample: CLTS, control, and areas where CLTS was carried out before the STS Research Component began. The latter areas, which we label 'Pre-CLTS' areas, have not received CLTS from WaterAid Nigeria and are not part of the control sample for the CLTS impact evaluation. None of these areas experienced SanMark activities prior to WaterAid's implementation as part of this study, and thus we included all of them in our study sample. During RA2, however, households in the 'Pre-CLTS' group were not interviewed because of budget constraints. They will be surveyed, together with the rest of the sample, during an endline survey planned for October 2017.

skewed towards any treatment group, and this is robust to controlling by LGA, in Column 2, and by household characteristics in Column 3. This reassures us that control and SanMark household samples are still balanced.

We also see from the row '*p*-value for *F*-test on covariates' that household characteristics, together with treatment status, are jointly significant in predicting attrition (*p*-value = 0.00). This is driven mostly by the gender and age of the household head, as we find a higher level of attrition among households headed by young males (not shown). This does not threaten our impact evaluation, because attrition is balanced across treatment groups. Instead, it means that the policy implications derived from our study might not apply to this particular group who have been dropped from our sample – an implication that should be kept in mind when interpreting findings from our upcoming survey round.

Table 2.4. Regression results for household sample at SR4.

Dependent variable:	Attrition at RA2		
	(1)	(2)	(3)
SanMark treatment status	-0.02 (0.02)	-0.02 (0.01)	-0.02 (0.01)
LGA FEs	No	Yes	Yes
Household controls	No	No	Yes
Attrition rate (control)	0.10	0.10	0.10
<i>p</i> -value for <i>F</i> -test on covariates			0.00
Number of observations	4,646	4,646	4,530

Note: Estimation results from regressions at the household level with attrition at RA2 as the dependent variable, and SanMark treatment status as the main coefficient of interest. Household controls include: age; age squared; gender; employment status and education attainment of household head; and a dummy variable indicating farming as the household's main economic activity. Errors are clustered at the level of randomisation. All controls are measured at baseline. Stars indicate statistical significance: * 10%, ** 5% and *** 1%.

3. SanMark Impacts to Date

In this section, we discuss the impacts of the SanMark intervention on two dimensions: firm performance (suppliers) and toilet uptake (households). First, we describe the experiences from a case study in our piloting area, the LGA of Igbo Eze North. Then, we exploit our RCT research design by which we randomly assigned both CBPs and households into SanMark and control groups, and we compare the evolution of both groups.

3.1 Case study: Igbo Eze North

The business phase of the SanMark intervention was piloted in the LGA of Igbo Eze North during the course of 2016, before it was rolled out in its final format to the rest of the LGAs in our sample. The suppliers selected into treatment in this group have therefore had a significantly longer exposure to the programme. They have also been followed more closely by WaterAid Nigeria staff, who were intent on streamlining the intervention and persuading as many businesses as possible to cooperate.¹⁵ The evolution of these businesses can thus be informative of the potential of the SanMark intervention, and can inform what we could expect to see in our study sample during the following months before the endline questionnaire.

Our sample identified 14 businesses operating in this LGA, six of which were classified as CBPs in the supplier survey carried out in December 2015 (SR3). Five of these suppliers still continued to operate in the CBP sector by the time the last supplier survey was collected in April 2017 (SR4), while the remaining supplier had stopped selling concrete blocks and was focused on cement and iron rods only. During the initial piloting stage, these six CBPs were approached to participate in SanMark and two of them agreed to participate. They completed the training and recorded positive sales of WET products during the months that the piloting was conducted.

By SR4, both suppliers were still active in the CBP sector and were offering WET products to their customers, including the pit-digging service, when necessary. One of them had successfully incorporated WET products to his sales portfolio, recording regular monthly sales of the three models in the WET product line. In a typical month, this supplier reported that they were selling a total of eight WET units (two dual sets, four offsets and two direct pit models), adding up to approximately US\$400 in monthly sales from these products only. Additionally, this supplier has introduced innovations to the product line, increasing variety in the supply. The second supplier did not regularly sell WET products in a typical month, but has indeed sold WET units in the past, and still offers them to his customers.

As a result of the piloting of this first phase of SanMark, focusing only on training suppliers, regular WET sales were achieved by one of the two businesses that participated in the programme. This suggests that positive WET sales are something we can expect to see in the future from our study sample. At the same time, it is important to note that any

¹⁵ While approaching suppliers for piloting, all eligible businesses were approached, leaving no room for a control group in this LGA. Therefore, this LGA was excluded from our RCT study sample.

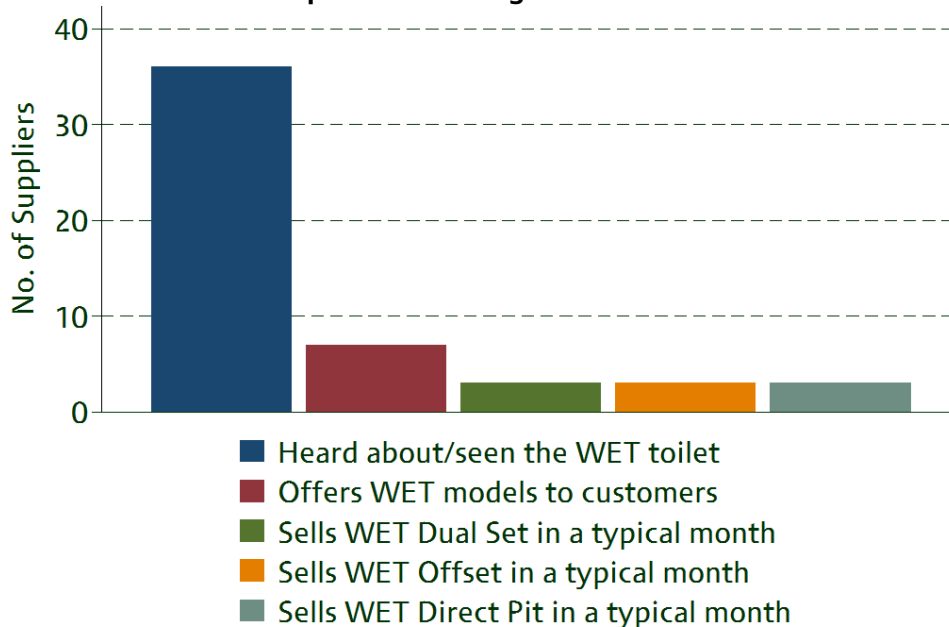
sales made by these suppliers, were achieved by on-site visits by customers, or by marketing efforts carried out by the businesses themselves. The second phase of the SanMark intervention, including the recruitment and deployment of D2D sales agents that raise awareness of WET products among households, has the potential to significantly increase the profile of the WET product line, and its impacts are still to be seen.

3.2 RCT results: SanMark uptake at the supplier level

We begin by taking a look at the supplier survey, in order to measure the degree to which the SanMark intervention has affected supplier behaviour. As mentioned above, participation in the intervention was optional for suppliers in the SanMark group, and participants received no monetary compensation for their assistance. However, they did have the option to borrow a US\$400 mould for free, which is a considerable advantage given that, at the time of the supplier baseline survey (SR3), their average monthly sales were US\$2,200 and their costs were US\$1,500.

Figure 3.1 shows that awareness of the WET models among SanMark suppliers is in line with overall uptake rates. Of the 60 SanMark businesses in our study sample, 31 attended the training, while 36 declared that they were aware of the existence of WET models. However, fewer businesses (seven) declared that they actually offered any WET model to their customers, as shown by the red bar in Figure 3.1. The three rightmost bars in Figure 3.1 show that just three SanMark CBPs declared that they sell WET models in a typical month. This suggests that the actual introduction of the WET models into their product line does not happen shortly after the training but takes a considerable amount of time.

Figure 3.1. Awareness of WET products among SanMark businesses.

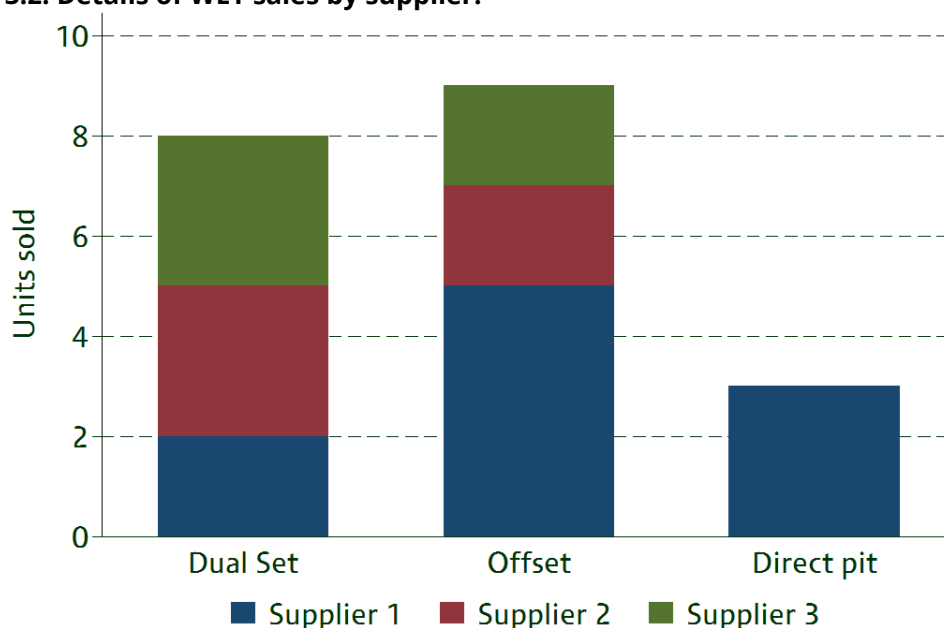


Source: SR4.

In Figure 3.2, we look at the actual volume of sales reported by the three suppliers with positive WET model sales. For each of three WET models, the businesses were asked the following questions. 'Do you sell [model] in a typical month?' Then, if so, they were asked

the next question. ‘How many [model] do you sell in a typical month?’ The three suppliers declared that they typically sold at least two units a month of the WET dual set and offset models, while only one of them declared that they sold WET direct pit models regularly. This last point deserves clarification: while the three suppliers responded that they sold WET direct pit models ‘in a typical month’ to the first question above, when asked *how many* units they sold in a typical month, two of them responded 0 units. We believe this might be because these suppliers still experience low sales of that particular model, but offer it on a regular basis to their customers and have sold units in the past. Figure 3.2 suggests that 20 WET units are now sold monthly in our study sample. This is in line with monitoring data from WaterAid, indicating that average sales in our study area plus Igbo Eze North are around 26 WET units in a typical month.¹⁶

Figure 3.2. Details of WET sales by supplier.



Source: SR4.

This slow uptake is most likely driven both by suppliers needing time to familiarise themselves with the WET toilet construction and by consumers needing time to become aware of their existence. The latter point is exacerbated given that the marketing component of SanMark, through the D2D sales agents, had not been completely implemented at the time of the data collection. Indeed, D2D sales agents were recruited and trained during the first quarter of 2017 and have only started operating since April 2017. Without their support as marketing agents for this new product, it is less surprising that sales of WET products remain low among the suppliers in our sample.

WET product sales should also be understood in the context of the market in which they occurred. In this sense, businesses in our study sample do not experience large volumes of sales of other sanitation products either. During SR4, only one supplier (a control) reported that they sold ceramic squat pans in a typical month (a total of eight units), and

¹⁶ From Section 3.1, we find that monthly sales in Igbo Eze North are around eight WET units. If we subtract this number from the 26 estimated internally by WaterAid, we have 18 WET units sold monthly in our study area, similar to the 20 declared by respondents in our sample.

none reports regular sales of full WC units. It is for this reason that the SanMark intervention targeted CBPs in particular, because they have the necessary skills to offer a cheaper alternative to these products with very low turnover in the area.

Suppliers were also asked about the price at which they sell their products.¹⁷ Of those who declared that they sold WET products, the average reported price for the WET dual set (which is comprised of two independent squatting pans linked to a single pit) is 28,500 NGN (US\$91).¹⁸ The average price for the offset model was 7,375 NGN (US\$24) and for the direct pit model it was 21,000 NGN (US\$67).¹⁹ There is little variation in these prices, most likely because suppliers are guided by WaterAid during their training sessions with respect to prices.

Interestingly, we also observe that out of the 69 CBPs in our control sample, 40 had seen or heard of the WET products. This represents 58% of the control group. Given that this is a group that has not been approached to participate in the SanMark intervention, these numbers suggest that information regarding new products flows fast in this market. There were 11 control suppliers that even declared that they knew suppliers who were offering WET products to their customers. This finding can be interpreted as indicative that both SanMark and control supplier groups are composed of around 60% highly motivated and business savvy firms, which will either participate in SanMark, if approached, or will find out about it, if they are controls.

3.3 RCT results: SanMark uptake at household level

The slow rate of adoption of WET products into the CBP product line is also reflected in the household data. Figure 3.3(a) shows the low levels of awareness among SanMark and control households regarding WET products. Respondents were first asked whether they knew about the WET product line. If they answered negatively, then they were shown photographs of three WET models and asked whether they had seen toilets like those in the pictures. Around 7% of the households declared either that they knew what the WET was, or that they had seen them. This percentage is not statistically different between SanMark control and treatment areas. This finding is sensible, as D2D sales agents only started their marketing activities after data collection. The households in this survey round who report that they have heard about the WET model, would have done so through other channels, such as directly through suppliers that could be located in the treatment or control communities. This type of exposure was not randomised or influenced in any way by the study design. When asked where they got to know about the WET, most of the households declared that they had been told about it by the local WASH unit or by friends and relatives.

Those households that reported that they knew about the WET were also asked their perception of its quality, as shown in Figure 3.3(b). Most of these households declared that

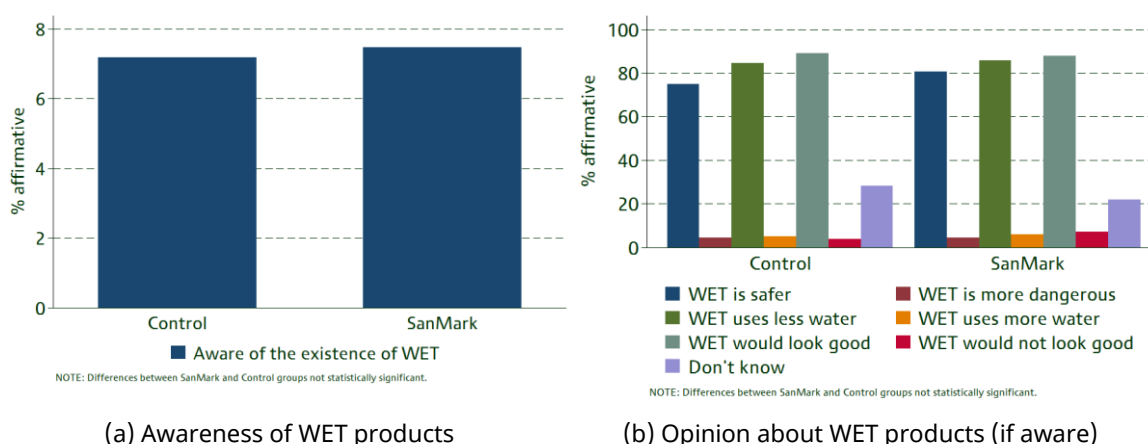
¹⁷ None of the WET models described above includes a superstructure for the toilet. This is left for the customer to decide and arrange for, although some suppliers might also offer this service.

¹⁸ We use a reference exchange rate of 313 NGN per US\$ for 16 April 2017.

¹⁹ These estimates include one supplier from Igbo Eze North that is not included in our sample, but average prices are almost identical if we restrict this to the three suppliers in our study sample.

the model was safer and that it used less water than other options in the market. They also declared that it looked good, a promising sign for future WET sales once the D2D sales agents go out into the field. All households hence had an encouragingly positive view of the toilet model developed and promoted as part of the SanMark intervention. Households were asked not only whether they are aware of the WET model, but also whether they have installed one. Among the 4,019 households surveyed at RA2 (again excluding Igbo Eze North), two declared that they had done so. This number is very small, but it is in line with the sales figures reported by the treatment suppliers. The number of households in our study area (excluding Igbo Eze North) was estimated at 43,500 in a census exercise conducted in 2014. Given that 20 WETs were reported to have been sold, this implies a ratio of 20/43,500 (= 0.0005), in line with the ratio observed in our sample (2/4,019 = 0.0005).

Figure 3.3. Awareness of WET characteristics between SanMark and control groups.



Note: The first question asked whether the respondent was aware of the WET. If the respondent responded negatively, a series of pictures of the models was shown and the question was asked again. The blue bar in (a) shows the share of respondents who declared that they knew of the WET models after these two questions. Bars in (b) present the share of positive responses to the following questions, from households who said that they were aware of WET products. 'Do you think the WET is safer/more dangerous than other models in the market?' 'Do you think the WET model uses more/less water than a flush toilet?' 'Do you think the WET would/not look good?'

Source: RA2 household questionnaire.

3.4 SanMark uptake – preliminary conclusion

We have shown that, as of April 2017, awareness of the WET product line has spread quickly among suppliers, while WET sales have evolved more slowly. Only three CBPs in our SanMark group declared that they sold these products in a typical month, albeit observing high levels of awareness of these products by both SanMark and control businesses. This slow inclusion of the WET product line into the businesses' regular sales was also observed among a selected group of suppliers from Igbo Eze North, who were introduced to SanMark earlier and thus have been part of the programme for an additional six months. We also found low levels of awareness of the existence of the WET models among households. Both findings suggest that the first phase of the SanMark intervention, focused exclusively on supplier selection and training, has successfully spread awareness of the SanMark project among suppliers in both treatment and control

areas, but it has not yet had significant impacts on business performance or toilet uptake by households. A rigorous regression analysis of these impacts (not shown) confirms these findings. This is also supported by anecdotal evidence from WaterAid Nigeria's experience in the field that points towards slow uptake by suppliers, and more interactions and handholding with participating businesses than initially expected.

Box 3.1. Context: oil price collapse and the Nigerian economy

The implementation of the SanMark intervention was conducted during an uneasy period for the Nigerian economy that has undoubtedly affected the context in which the suppliers in our sample operated. In 2014, the price of oil, Nigeria's main export product, and the source of an estimated 70% of government revenues, plummeted. After reaching a peak in June 2014, prices fell dramatically, and by January 2015 spot prices for crude oil were trading at 45% of its price six months before. Oil prices have not recovered, and the Nigerian economy has experienced slow growth since then. Indeed, according to the April 2017 World Economic Outlook Report by the IMF, in 2015, Nigerian GDP per capita growth fell to negative figures (-0.09%) for the first time since 1999, after a decade of high and sustained growth. GDP growth per capita, in constant prices, also fell during 2016 by 4.18%, according to the same report. While oil prices are expected to pick up over the course of 2017, there are few signs of an imminent recovery from the Nigerian economy.

Out of the 129 CBPs eligible for SanMark treatment, 104 were active at SR2 (December 2014), 119 were active at SR3 (December 2015) and 107 were active at SR4 (April 2017). Figure A.1 in the Appendix shows the average quantity of bricks sold by each active and SanMark-eligible CBP in our sample, over the past three survey rounds. Between SR2 and SR3, in other words, over the course of 2015, these suppliers have seen their concrete block sales volumes fall, on average, by almost 40%. This slump in sales is likely to be related to the fall in the growth rate of Nigerian economy since the slump in oil prices began in mid-2014. Between SR3 and SR4, from December 2015 to April 2017, average reported sales, in quantities, among active CBPs increased by 3%, suggesting that the sector has stopped shrinking. While the economic context should not affect our research strategy, it is worth pointing out the harsh macro-economic conditions under which CBPs in our sample are operating and making investment decisions. We will continue to track the evolution of the Nigerian economy to check whether the sector we study is exposed to any other extraordinary shocks before the following data collection wave, to be carried out during the end of 2017.

At the same time, the implementation of the D2D sales agent component shows great promise in the described context. This is because among the few households who did say that they knew about the WET product line, their perception of the products was very positive. At this stage, where some of the suppliers are willing, able and ready to sell the new product, greater household awareness (especially the positive perception described above) has the potential to drive up sales. We will analyse this mechanism with the next round of data, with an endline survey planned for October 2017, approximately six months after initiating the sales agents' activities.

3.5 Spillovers in technology adoption

We have focused so far on the changes observed in the SanMark group of CBPs. If SanMark and control CBPs were to operate in independent markets, then we should not expect to have any programme impacts on the control group. As we demonstrated in our baseline report (Abramovsky et al. 2015), this is certainly not the case for the businesses in our study sample. SanMark and control businesses operate within the same LGAs, they share markets and they compete for clients. Therefore, we cannot rule out programme impacts on control CBPs as well, albeit of a different nature from the impacts we expect on the SanMark group.

Control CBPs do not participate in SanMark business training sessions. They cannot borrow WaterAid's mould for the WET offset model and, most importantly, WaterAid sell SaTo pans to SanMark CBPs only, so control CBPs cannot sell any WET products at all. Given the slow pace of adoption of the programme among SanMark suppliers, it is unclear whether this represents a significant disadvantage for control CBPs. During the implementation of SanMark's first phase, several control CBPs have approached WaterAid Nigeria staff wanting to participate in the programme, suggesting it might be regarded as a profitable strategy. However, revenues, costs, quantities sold and rates of closure remain identical, on average, between SanMark and control suppliers.

In any case, the adoption of WET models is (for now) not an available adaptation strategy for control CBPs, because of the restrictions just discussed. Therefore, we will be interested in measuring other margins such as product variety, the introduction of new sanitation products (other than WET models) and/or adjustments in price margins, on behalf of control CBPs. We could interpret these changes as reactions to the introduction of a new product in the market to which this group has no access – a context comparable to that of the arrival of a new patent-protected product. Evidence from the field has already pointed towards small product innovations being performed by SanMark CBPs on the WET models, so similar behaviour can be expected from the control group as well. We will evaluate whether this happens and whether any differences appear between SanMark and control CBPs on a wide range of business performance indicators at the endline survey, in October 2017.

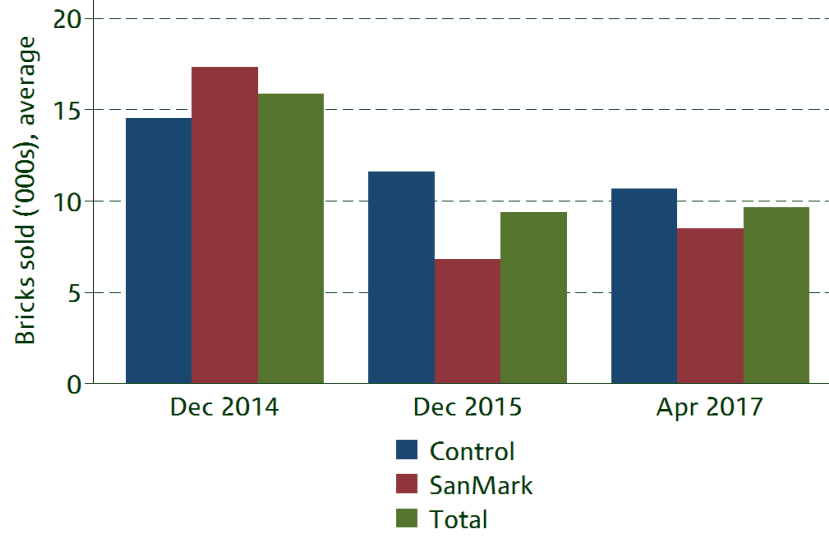
4. Conclusions and Next Steps

We have shown that as a result of the implementation of the first phase of the SanMark intervention, awareness of WET products among both SanMark and control suppliers is high, with around 60% of the businesses in our sample having heard of or seen the products. At the same time, SanMark has not yet resulted in large levels of sales of WET products, and WET ownership in our area of study remains low. This is coupled with extremely low awareness of WET products among consumers (households), but there is a positive perception of the products among those who know about them. D2D sales agents, who were trained and deployed during April 2017, as our last data wave was being collected, were recruited with the purpose of tackling this challenge. In the second phase of this intervention, these agents will raise awareness of WET models among households via marketing campaigns and D2D visits, filling the knowledge gap documented in this report. We will evaluate the combined impact of the two components of the SanMark intervention with an endline data collection exercise planned for October–December 2017.

In the next report in this series, we will revisit most of the impacts estimated here, and we will focus on the how D2D activities affected household demand for, and uptake of, WET products. We will analyse the impact of the SanMark intervention on a wide range of business performance indicators at the firm level. We will also be interested, as part of the wider objectives of the STS Research Component, to explore the combined impacts of CLTS and SanMark interventions. Finally, if possible, we will analyse the dynamics of firm entry to, and exit from, the CBP sector, by treatment arm and by LGA.

Appendix

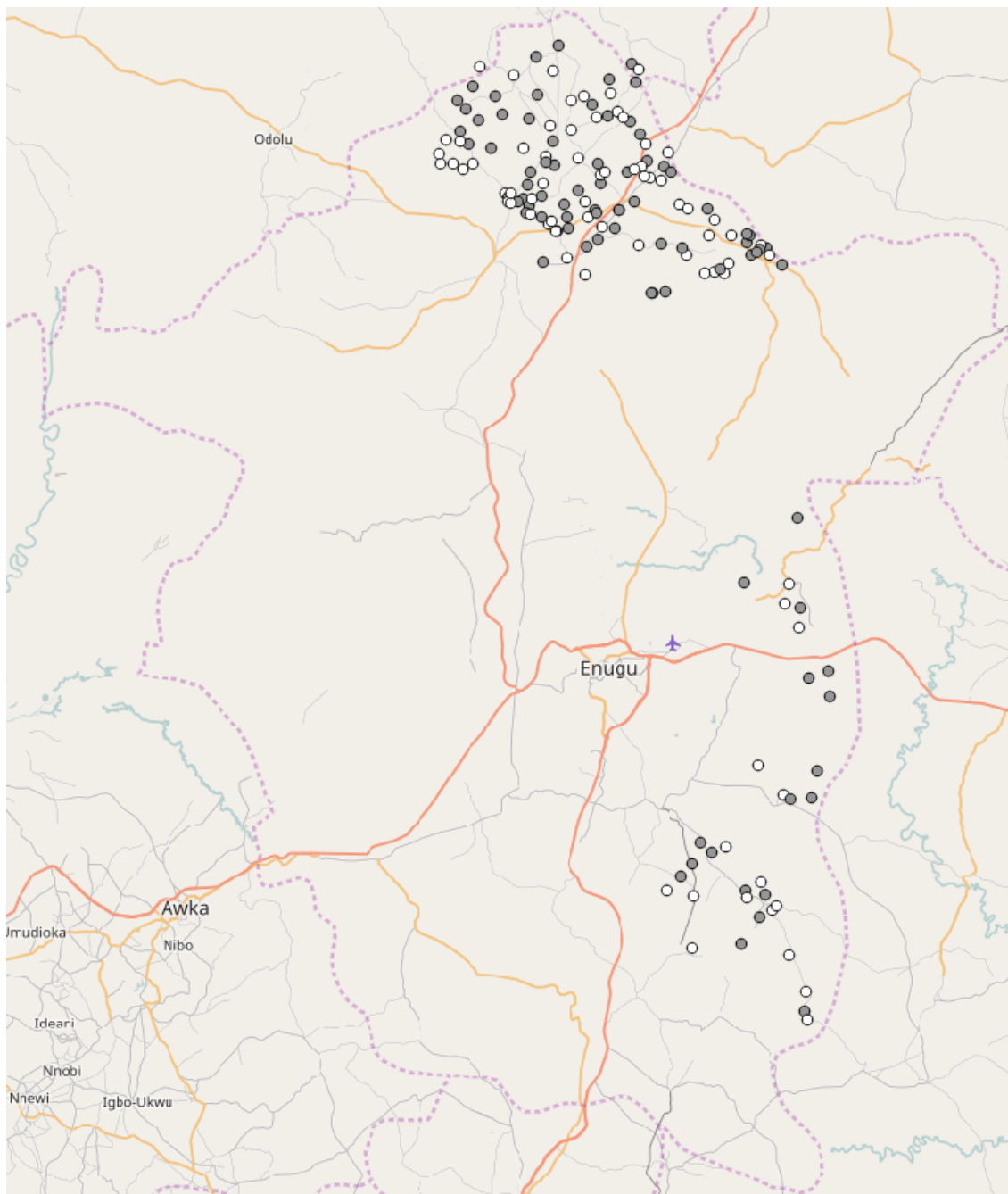
Figure A.1. Average number of bricks sold by CBPs, in thousands.



Note: Average number of bricks sold by active CBPs during each survey wave. Solid, hollow and fancy blocks of any size were included in the total sold.

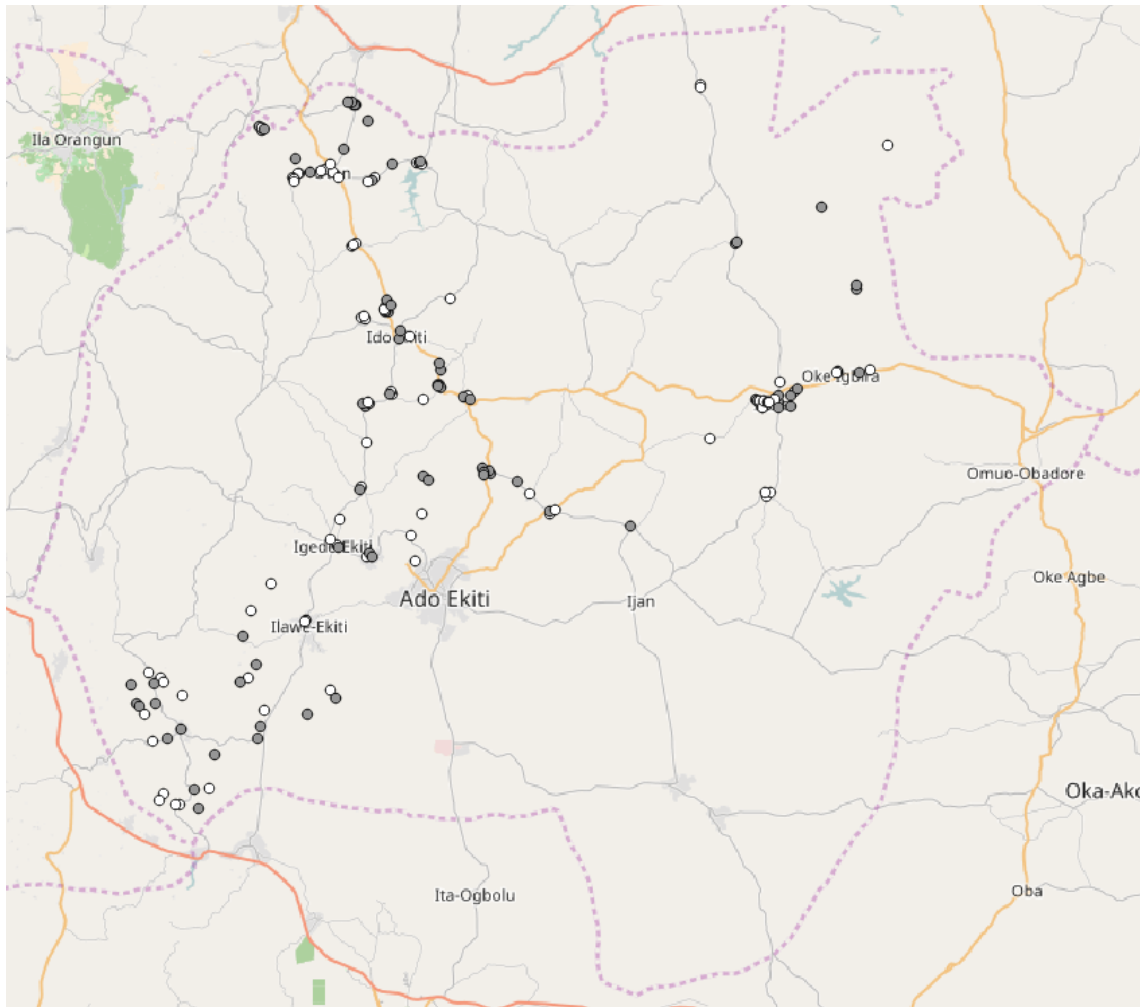
Source: Authors' own estimates using SR2, SR3 and SR4 data.

Figure A.2. Location of SanMark and control triggerable units in Enugu state.



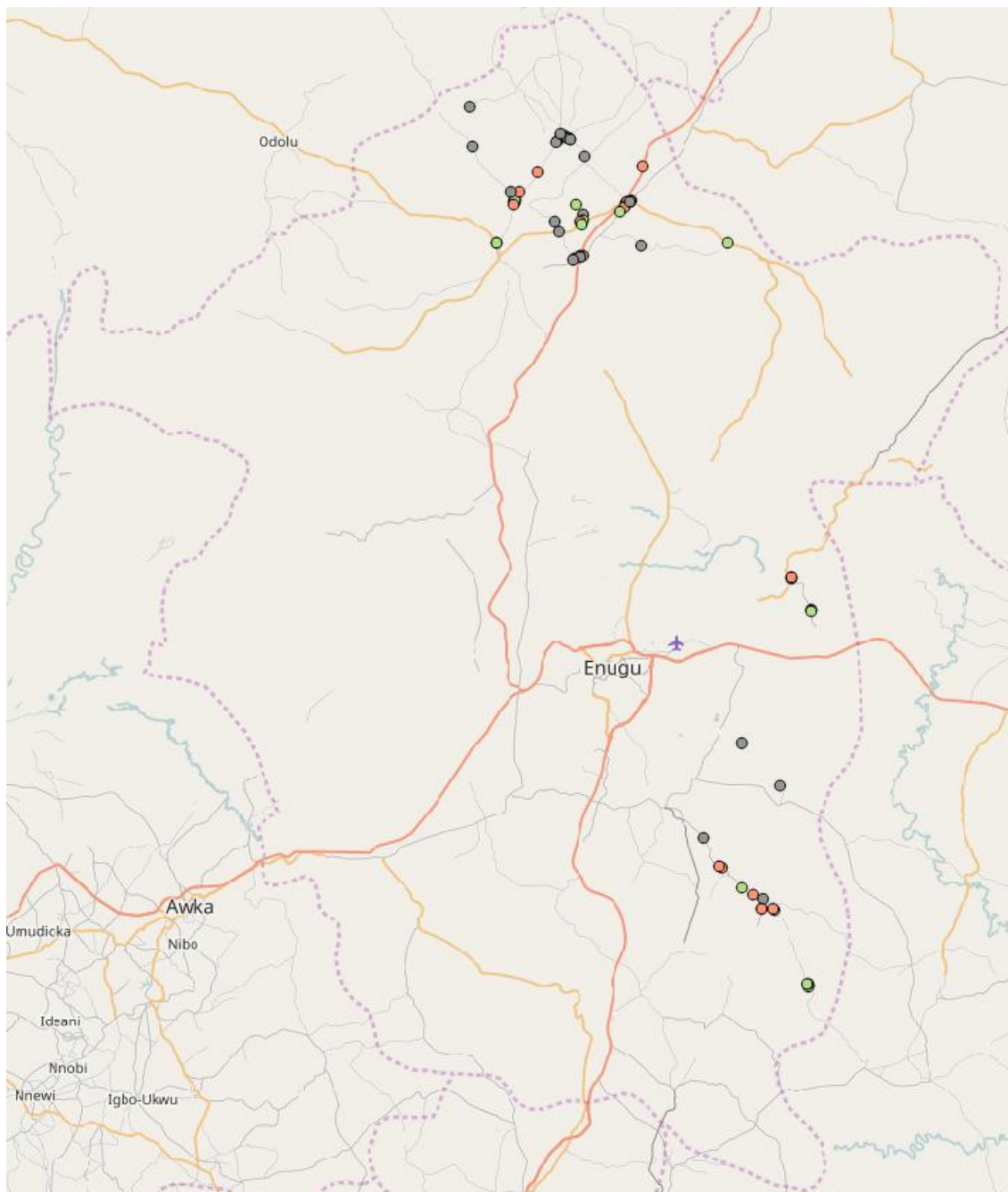
Note: SanMark (grey) and control (white) triggerable units in the state of Enugu. Locations indicate the centroid of a polygon formed by all of the households interviewed in each triggerable unit.

Figure A.3. Location of SanMark and control triggerable units in Ekiti state.



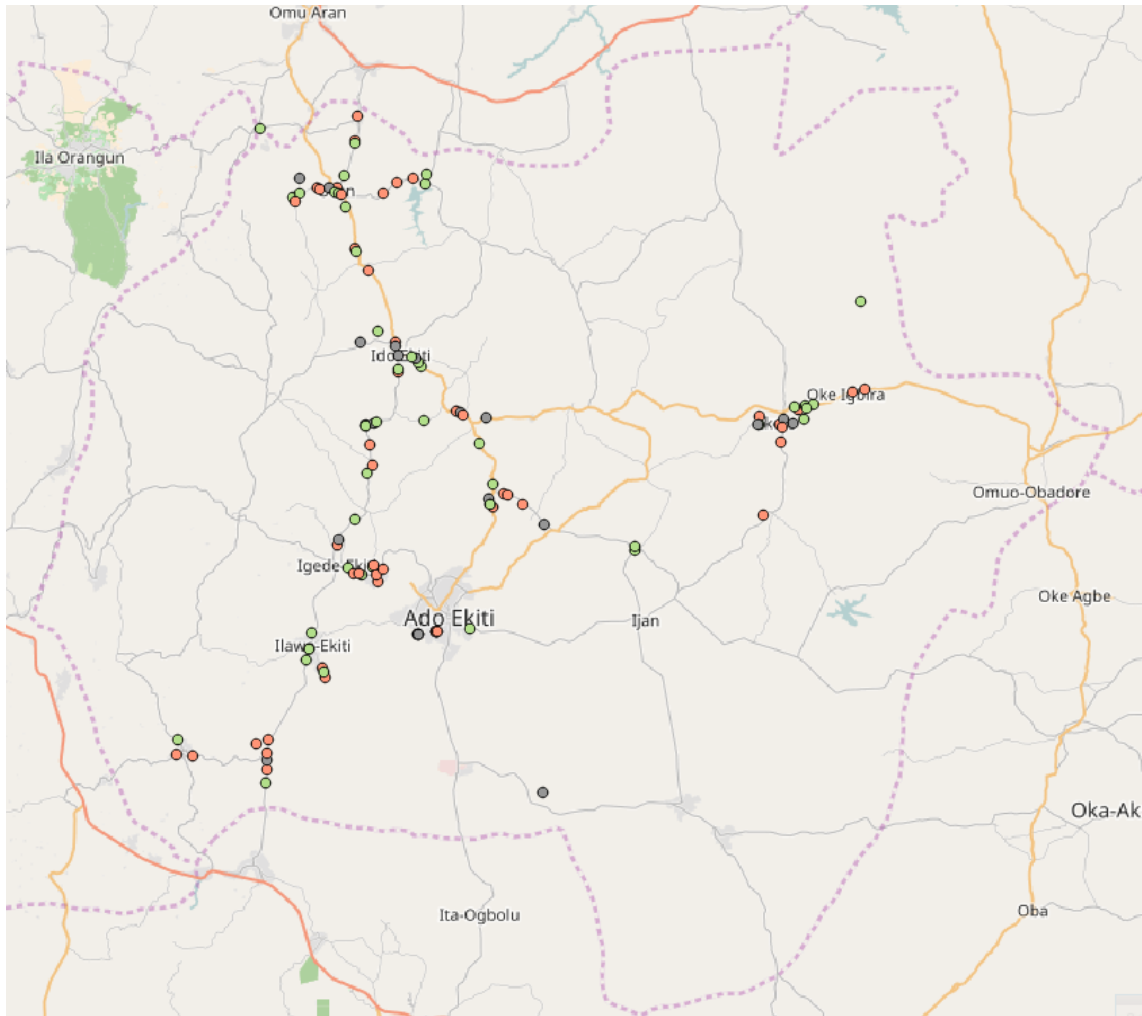
Note: SanMark (grey) and control (white) triggerable units in the state of Ekiti. Locations indicate the centroid of a polygon formed by all of the households interviewed in each triggerable unit.

Figure A.4. Location of SanMark and control suppliers in Enugu state.



Note: SanMark CBPs (green), control CBPs (orange) and suppliers not in our study sample (grey), in the state of Enugu.

Figure A.5. Location of SanMark and control suppliers in Ekiti state.



Note: SanMark CBPs (green), control CBPs (orange) and suppliers not in our study sample (grey), in the state of Ekiti.

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