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Examining the local financing of rainwater harvesting (RWH) in low-income settlements of Enugu, Nigeria

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In this paper, we have tried to examine the contributions of RWH to household water supply in five low-income settlements with severe household water supply. Data were obtained from focal discussions and questionnaire that was served on key stakeholders. Result shows that the sensitization campaign embarked in the area by two NGOs (EDIA, and Rainwater Partnership Nigeria) did awake the interest of the inhabitants on RWH. This interest was sustained by a loan scheme to consumers known as Rainwater Improvement Loan from Micro Finance Bank to buy tank and other RWH infrastructure. All these increased the household percentage of rainwater supply from 20.2% in 2015 to 70.7% in 2017. Some challenges being experienced include the problem of low quality of initial rainwater of the year, while lessons learnt include the fact that local financing provides simple saving arrangement that enable them acquire tank and rainwater infrastructure.

Introduction

The problem of severe water supply shortages is a common feature of most low income urban districts of Nigeria, despite government's efforts through donor partners to provide the amenity. According to official statistics, over 60% of people in this area lack access to clean water supply (NBS, 2006). Some of the sources of water supply in the area include surface water bodies, unprotected shallow wells, water vendors and amongst these, surface water bodies (rivers, stream, lakes, ponds) are highly patronized. This is not in line with the situation in other parts of Africa and Nigeria. For example, in the Great Accra Region of Ghana where groundwater is primarily relied on by the populace and in parts of Lagos where groundwater is the major water supply source despite its high salt water content (Gronwall, 2016; Capstick, et al 2017, and Brimo, 2017). However, Ezenwaji (2010) in the study of sources of water supply in Old Njikoka LGA of Anambra State (a peri-urban area) found that out of the four Local Government Areas studied only one (Anaocha) relied most on rainwater harvesting, while all others depend highly on surface water bodies. As a result of this dependence on these sources, UN WWAP (2003) noted that it has given rise to increase in sicknesses and morbidity, decreases members of the household's available time and resources for productive activities and thereby reducing population welfare in developing countries. Also, Ezenwaji (2008) saw the urban poor in Enugu as most vulnerable to waterborne diseases because of severe water supply scarcity of the area. In all these, it is clear that in Nigeria the potentials for (RWH) is ignored for obvious lack of its immense contribution to the improvement of water access, especially in poor urban communities. But this situation is contrary to what obtains elsewhere in Africa. In Uganda for example, many poor urban communities and families have since migrated from surface water bodies to rainwater source of water supply with great success. Many of these urban poor people value this water source for convenience, productive use and most importantly the actual ownership and control bestowed (Kiwanuka, 2011). Poor recognition of this source of water supply to improve the water supply situation of the urban poor in Nigeria has led to its non-funding by government. However, this is not so with some urban communities in Nigeria that have taken the challenge through the building of the capacity of households to raise funds to construct, operate, maintain and finance the system as is the case

in Uganda (Baziwe, 2010). The success story of local financing of domestic rainwater in some low-income communities of Enugu urban area Nigeria is therefore discussed.

Background

In Enugu urban area, the population not served with municipal water supply is increasing by the day because of the continuous influx of people into the town. Severe lack of water is experienced in about seventeen low income settlements of the urban area, some of them veritable slums and others squatter communities. In these settlements, water is primarily sourced from nearby streams whose water is of doubtful quality because none of these settlements is served with municipal water supply because of their hilly locations and the fact that the urban incumbent water authorities see water connection to such areas as a complete waste of scarce resources.

Lack of water in these environments of slum and squatter made some NGOs primarily EDIA and Rainwater Partnership, Nigeria, to begin the sensitization of the populace in some of the low-income communities of Enugu in 2015 on the need to source domestic water supply from rainwater which is seen as a clean and sustainable source of water supply. That effort yielded a lot of good dividend as five out of the seventeen low income communities have embraced the message resulting in the immediate formation of community organizations aimed at exploiting the innate potentials of rainwater as a way of meeting their household water need. These low-income communities are Ugbo Aaron, Ugbo Alfred in Enugu North Local Government Area (LGA), Ugbo Odogwu and Ugbo Oghe in Enugu East and Agric Farm in Enugu South L.G.As. The communities resemble in terms of their small population, which ranges from about 3,300 to 7,100 persons with a household size of 10 and room occupancy ratio of 6.2. The environment of these communities is dirty and squalid and has become home to crimes and diseases especially waterborne diseases.

Each of these settlements has a branch of the organization known as Enugu Rainwater Consumers Association (ERCA) which the five settlements have collectively formed and patterned along the Ugandan Rainwater Harvesting Association. The aim of this group according to the NGOs that formed them was to raise the profile of rainwater harvesting as a source of domestic water supply in the low income urban communities through rainwater improvement loans. The ERCA of each district is linked to each other while its apex body supervises the branches. The structure of the organization is such that there is a General Manager while managers are in-charge of the branch offices. Under the General Manager are the General Secretary, Treasurer, Financial Secretary and PRO, while the branches have the managers, Under Secretaries, Financial Secretaries and Treasurers. The General Manager has a term of 5years and no more, all other officers have only a tenure of 3years. Meetings of the branches are held every month while that of the entire organization is every quarter of the year. The organization through the help of the NGOs has partnership with a Microfinance Bank that has established a loan portfolio known as Rainwater Improvement loan. This loan which is meant for only households who are members of the organization and designed to assist members purchase appropriate capacity rainwater tanks and other rainwater infrastructure, and pay back within 1 year at 5% interest.

The organization (ERCA) negotiated and had understanding with a plastic water tank dealer who supplies tank to any member in need. The tank dealer is normally paid through the Microfinance Bank. Each beneficiary must buy a tank of desired capacity as advised by the NGOs which should be designed to ensure that enough rainwater is collected to meet the households yearly water demand. Again, member households contribute a monthly due of ₦500.00 (\$1.4) at the current rate of ₦360 to \$1.00 to maintain membership. Apart from this source of funds, well-meaning individuals have also donated substantially to the organization, one of such recent donations was ₦3,000,000 or (\$8,300.00). For only three years (2015 – 2017) of the operation of this body, clear successes have been recorded in the quantity of water supply from rainwater source. Not minding this, although sachet water is widely available, but its cost which is ₦20 (5.5 cents) per sachet, cumulatively cost ₦4,500 (\$12.3) for a family of 10 per month. This is above the income of most of the households in the settlements.

Methodology

Focal group discussions and questionnaire responses were used to ascertain the success or otherwise of this local financing option in the affected areas. Questionnaires were served on 120 heads of households and the head of the two NGOs, General Manager and five managers of ERCA group. Field administration and analysis of questionnaire were conducted between April and September, 2017. Five research officers were employed to organize the group discussions, administer and collect questionnaire from respondents.

Data analysis

Simple statistical techniques were used to analyze the data collected, while line and bar graphs were utilized to deduce patterns and relationships. The analysis surveyed the water supply and demand, as well as water quantity conditions in the startup year of January, 2015.

Results

Table 1 shows the basic statistics of the study area indicating its 2017 projected population, number of households in each settlement, number of households registered in the ERCA, number of households that have benefited from the loan scheme etc.

Table 1. Basic statistics of the study area						
Community	Project 2017 Population	Number of Households (HH) 8pers per HH	No. of HH enlisted as at Dec. 2017 from 2015	% of population so far enlisted	HH who have Benefitted from the loan	% HH Benefitted from the loan
Agric Farm	5266	658	161	24.5	112	69.5
Ugbo Aaron	5998	750	303	40.4	210	69.3
Ugbo Alfred	5365	671	285	42.5	205	71.9
Ugbo Odogwu	6446	806	319	39.6	218	68.3
Ugbo Oghe	9260	1,158	384	33.1	271	70.6
Total	32,335	4,043	1,452	35.9	1,016	69.9

From Table 1 we can see that the rain harvesting programme has achieved a lot of success in the study area. Out of 4,043 households, 1,452 representing 35.9% have embraced the programme, while 1,016 or 69.9 have secured the loan and installed the rainwater infrastructure including tanks in their houses. This, as we shall see has translated into high rainwater harvesting and more water for the household (Figure 1).

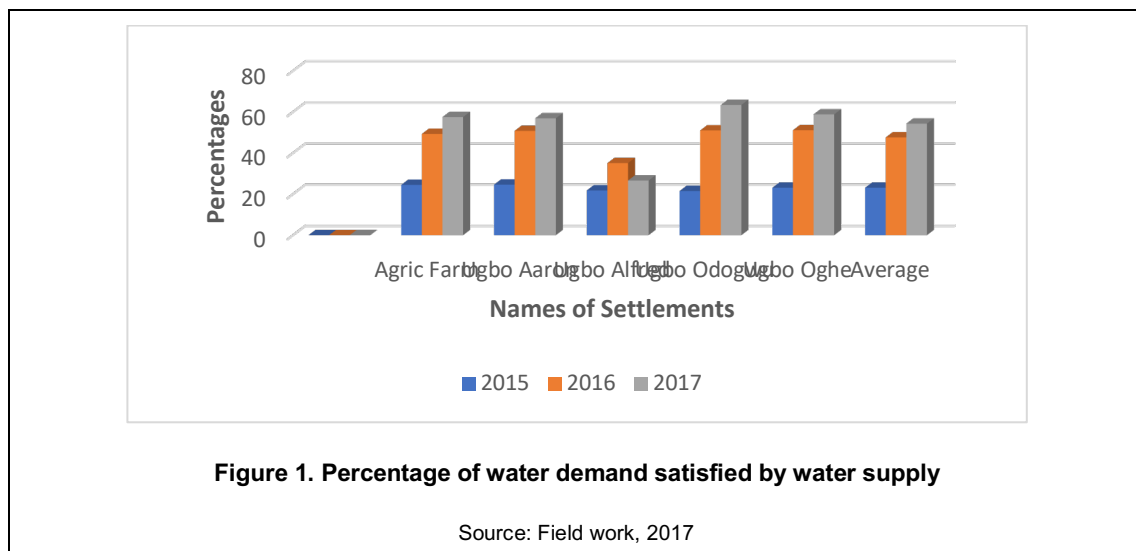
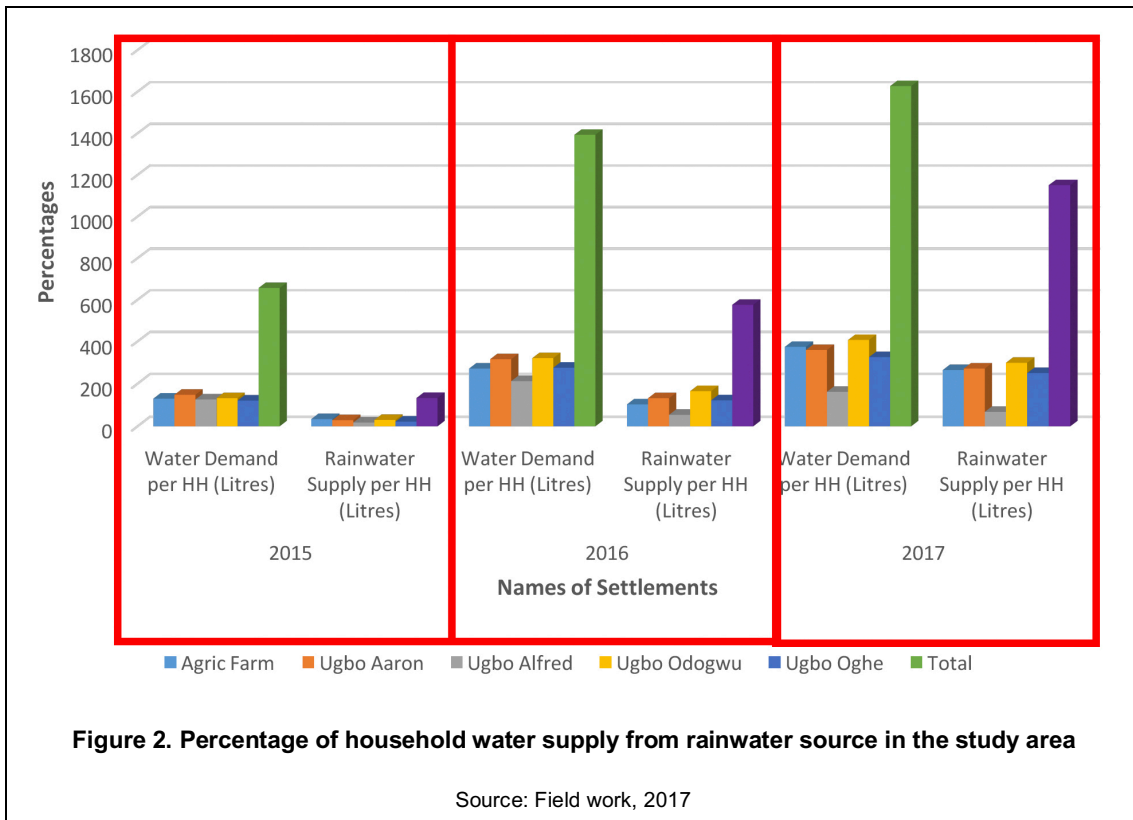


Figure 1 has clearly revealed the temporal profile of water demand and supply, in terms of its percentage of water demand satisfied by water supply between January 2015 and 2017. One sour area that sticks out in the profile is the poor performance of this programme in Ugbo Alfred as was ascertained from both the questionnaire responses and focal discussions with the inhabitants of the area which has been attributed to the

poor acceptance of the programme by households in the area because of the poor handling of affairs by the committee in charge of the district. One reason for this is that beneficiaries from the community are having some issues with the Microfinance Bank as the Bank complained that people from that particular community usually do not agree to pay the mandatory bank interest. However, overall, the percentage of water demand satisfied by water supply in various years of the programme are as follows: 23.1% (2015), 47.6% (2016) and 54.3% (2017). This shows that despite the poor performance of households in Ugbo Alfred, the overall result can be considered as fair. From focal discussions and questionnaire responses we were equally able to ascertain the percentage of rainwater that went into the household daily general water supply (Figure 2).



From Figure 2, it is apparent that the percentage of water supply per household from rainwater source is undoubtedly increasing. From the overall outlook it is seen that this percentage increased from 20.2% at the start of the programme in 2015 to 41.3% (2016) and 70.7 (in 2017) and it is hoped that with time these low-income communities will be fully dependent on rainwater supply.

Table 2 shows the number of households who had benefitted from bank loan for the purchase of tanks and RWH infrastructure. This loan payment has continued to register increases as more households get enlisted into the programme.

From banks record, the amount of money households have secured as loan for RWH which started with ₦10,918 and has now reached ₦2,270,000.00. All these reflect the success of the scheme in the study area over these few years, (Ozioma MFB, 2017).

Discussion

The need for alternative water supply source by poor households in the study area has become necessary in view of the successes recorded. In our study area, the successes so far achieved in the rainwater harvesting scheme in the five districts except perhaps for Ugbo Alfred was as a result of the smooth operation of the local finance system, as well as, the sensitization of the area by NGOs to generate interest on the rainwater harvesting. Here EDIA and Rainwater Partnership did well to promote the use of alternative source of water supply which has now seem to be a permanent solution to the deleterious water shortages in our studied communities. The job of EDIA and Rainwater Partnership, Nigeria is the same as Partners for Water and Sanitation (PfWS) which operates on the ground of partner involvement in knowledge transfer to help provide

capacity building and ensure the sustainability of projects in communities (Olugboye and Hayes, 2011). The work of PfWS technical support to Anambra State, Nigeria helped the State to have a better knowledge of the strategic decisions necessary for improved water supply. Also, in Uganda, the same effort was made by Water Aid which pioneered the manufacture and popularization of the rope pump as an alternative technological option to enable the water scarce communities access well water. The increasing awareness being created by these two NGOs for the reliance on RWH has been of great benefit to the marginalized rural and urban communities. It is of great interest that by 2017 the percentage share of household's water supply from RWH in low income settlements of Enugu increased from 20.2% in 2015 to 70.7% (Figure 2), while the funds that were accessed rose from mere ₦10,918 (\$30.3) in 2015 to ₦2,270,000 (\$6,306) in 2017 (Table 2). The ERCA as a self-help group is committed to using their micro-credits to improve rainwater collection and thus has contributed to improved water supply access in the affected communities. However, in spite of these successes there are a number of challenges faced by ERCA to achieve the desired access to safe, adequate and sustainable water services through RWH source in our study area. Some of them are presented below:

1. The payment of monthly dues to sustain membership is having some problems because some members are complaining that the due is heavy on them considering their low-income status.
2. Not all households that collected the loan have been able to acquire simple RWH technology especially the tank after months of collecting the loan, raising the suspicion that some divert the loan for other purposes.
3. Some households still battle with the quality of rainwater especially at the beginning of rains when the dirt from the zinc surfaces are washed into the tank. This is because the individual houses do not have first-flush system and regular rainwater quality test is not usually done by the authority concerned, but it conducts tests for surface or groundwater which the authorities rely more for public water supply.
4. Despite successes recorded, government is yet to approve RWH as a good water supply source that should be drawn into conventional urban water supply system through policy intervention.

Urban Community	Number of Households embracing RWH			Amount of money loaned to Households by the Bank		
	2015	2016	2017	2015 (₦)	2016 (₦)	2017 (₦)
Agric Farm	39	103	161	2,600	154,000	402,000
Ugbo Aaron	44	213	303	1,850	169,000	522,000
Ugbo Alfred	40	200	285	2,100	128,000	143,000
Ugbo Odogwu	51	194	319	1,920	204,000	610,000
Ugbo Oghe	46	201	384	2,448	215,000	593,000
Total	220	911	1,452	10,918	870,000	2,270,000

Lessons learnt

1. From the successes recorded here, NGOs should get more involved in sensitizing urban communities on the need to rely on RWH.
2. The urban poor value this alternate water source for convenience, but more importantly for bestowing ownership and control on him which unlike the conventional system where these intrinsic benefits are lacking
3. The low-income urban communities can easily form association because of their low heterogenous character.
4. The programme has the potential for scaling up to other low income urban communities if the same condition that exists in these areas apply to the new areas
5. RWH as a self-help model can help in filling the water supply gap created by either unavailability of conventional system or its complete lack as is the case in our study area.
6. The local financing model provides a simple saving arrangement that builds confidence on members.

Conclusion

The local financing model for the provision of alternative water supply to unserved urban communities in Nigeria and other developing Countries is an enabler for the provision of unconventional water supply. The fact that in just three years the number of households that benefited from the loan scheme grew from 0 to 69.9% of the number of households that enlisted in the programme is a cause for gladness. The home-grown water governance structure in practice and the smooth operation of the local financing system are factors that will ensure the sustainability of RWH in the area. The successes recorded indicated that it holds good promise for the future provision of water supply that will satisfy the demand in the area. Our hope is that the government should come in and embrace it though water proper policy provision.

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