

Case Study Use Perceptions Groundwater Lagos

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Use and perceptions of groundwater in an urban area - Lagos, Nigeria



A private water supply borehole in Lagos, Nigeria. Image credit: Adrian Healy.

The project

This project investigated the domestic water sources used by a selection of residents of Lagos, Nigeria, by using an internet-based survey. The survey was deliberately targeted at a demographic that was thought likely to be able to invest in a private domestic borehole, in order to assess the prevalence and perceptions of private water boreholes among this demographic.

For most of the people questioned, groundwater from a private borehole was indeed their main water supply, but most of them also used other water sources in addition to the borehole. The project investigated people's attitudes to water supplies from these different sources. It was carried out as part of the wider research project [RIGSS](#) (Resilience In Groundwater Supply Systems: Integrating resource-based approaches with agency, behaviour and choice in West Africa).

How was the project carried out?

An online internet survey was carried out with 539 residents of Lagos State, Nigeria.

The survey respondents were asked:

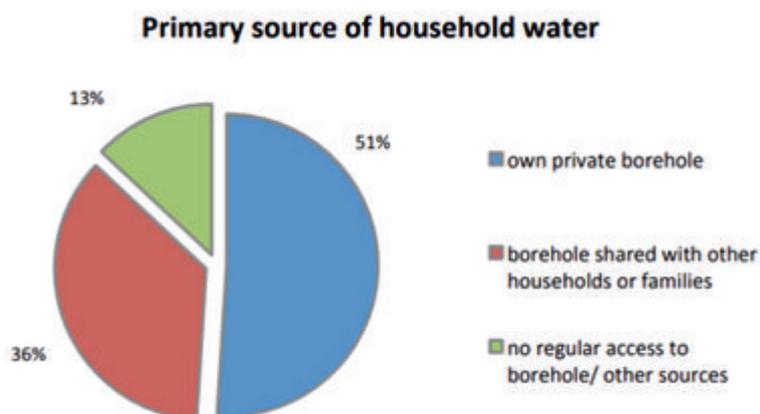
- what is their primary, and any other source, of household water supply?
- how they perceive the reliability and quality of their water sources.
- how they perceive environmental risks to groundwater supplies in the city.

The survey respondents were individuals who had previously signed up to participate in online surveys; and more than half reported their personal income was higher than the average starting

salary for a school leaver joining the Nigerian Civil Service. This is likely to mean that this survey is biased towards the higher income brackets, and may not be representative of the whole Lagos population. Nevertheless, the results provide a detailed and useful indication of urban water use behaviour and perceptions in the city.

Where do Lagos residents get their water supply?

Only 41% of respondents to this survey had a piped water supply to their homes. For around 50% of the respondents, their primary water source was their own private borehole, and for a further 30%, their main water source was a private borehole shared with others. Only 13% did not have regular access to a borehole, or mainly used other water sources than groundwater direct from a borehole; and most of these stated that they would like to have their own private borehole if circumstances allowed.



Primary source of household water for survey respondents in Lagos. Image source: [Capstick et al. 2018](#)

The strongest measured demographic association with private borehole ownership in the survey was home ownership and home type (house with garden/land). The low proportion of respondents with no direct access to groundwater may be linked to the demographics of the survey respondents: this proportion may be higher in different socioeconomic groups.

Other water sources used by the respondents include water from tanks and carts, bottle and sachet water, community boreholes, and open hand dug wells.

Around 80% of respondents whose main water source is their own private borehole also share their borehole with neighbours and, in fewer cases, to others in the community, with 90% of these saying that they did not charge others to use their borehole.

Most of the respondents to this survey, therefore, use groundwater direct from a borehole as their main water source. However, many people used multiple sources of water, and differentiated between sources in terms of how appropriate they thought each was for various purposes, such as for drinking, cooking, bathing, washing laundry and dishes, and flushing and cleaning toilets and bathrooms. Most of those surveyed, even those with private boreholes, use bottled or sachet water as their main drinking water source. Factors that were most important in their choice of which water source to use for drinking were quality, taste/appearance, reliability, and ease of access.

The proportion of users of each source using the water for drinking is shown in the table.

Water source	% of respondents regularly using this water source who use it for drinking
Bottle or sachet	97
Own private borehole	58
Piped water into the home	35
Shared private borehole	30
Water delivered by tanker	22
Water delivered by cart	11
Community borehole with hand pump	14
Community borehole with overhead tank	17
Open hand dug well	5

What do Lagos residents think about their groundwater resource?

People's perception of the availability of groundwater was generally positive - most perceived that groundwater was plentiful and few were concerned about over-abstraction.

The respondents were more ambivalent about the quality of groundwater, but most people with their own or access to another private borehole thought they could rely on the quality of water from it. However, most respondents also reported they used some form of household water treatment - usually boiling or a water filter, or less often letting the water settle and/or adding chlorine bleach. Those with their own boreholes were more confident in the quality of their water, and less likely to treat it.

Around half of respondents thought there was little risk of groundwater in Lagos becoming contaminated. However, there was a strong awareness that the siting and physical condition of a borehole can affect the quality of water from it.

How do Lagos residents feel about their water access and security, now and in future?

Almost all the respondents agreed that access to groundwater via a private borehole is desirable and could help people cope with water shortages. They perceived that borehole drilling, although fairly expensive, was reasonably easy, and was a viable and reliable alternative to municipal piped supply.

Most respondents agreed that more people in Lagos have their own borehole now than did ten years ago. This is supported by the median age of private boreholes reported in the survey, which was 5 - 6 years, with a small proportion (14%, excluding 'don't know' responses) being over 10 years old, demonstrating the recent onset of this trend towards private boreholes.

Most agreed that water is a resource that everyone should take care of, but most also thought that people with their own boreholes should be able to abstract as much groundwater as they liked, and very few believed that abstracting groundwater could lead to environmental damage.



Water storage tanks above two private water boreholes in shared use on a new housing estate in Nigeria. Image credit: Adrian Healy.

Implications

This study indicates that private access to urban groundwater is widespread in Lagos. One of the driving factors for this may be the relatively poor provision of piped municipal water supplies. Less than half of those surveyed had piped water to their homes, which is particularly striking given that the respondents are likely to represent the upper wealth categories in Nigeria.

The study also shows that people generally perceive groundwater from private boreholes as reliable and safe sources of water, and put this water to a full range of purposes. Groundwater supplies are seen as abundant, and private boreholes are perceived as providing an effectively unlimited and safe water supply. Most of those who are unable to access groundwater themselves would like to be able to do so.

This suggests that the recent trend in Lagos of drilling and use of private boreholes is likely to continue, unless it is limited by regulation. Although private boreholes offer security of water supply at the moment, continued unregulated groundwater abstraction may lead to over-abstraction and falling groundwater levels, which will reduce the available resource.

Quality problems may also affect the safety of private groundwater supplies. Although most people in this study perceived the quality of groundwater to be reasonably good, this was largely based on appearance and taste, and there seems to be little chemical and microbiological testing of water supplies. Substances hazardous to health can be present in water without obvious appearance or taste effects.

Sources

Capstick S, Whitmarsh L, Healy A and Bristow G. 2017. [Resilience in Groundwater Supply Systems: Findings from a survey of private households in Lagos, Nigeria](#). RIGSS working paper, Cardiff University, UK.

[RIGSS](#) project website.

See also: Healy A, Danert K, Bristow G and Theis S. 2018. [Perceptions of trends in the development of private boreholes for household water consumption: Findings from a survey of water professionals in Africa](#). RIGSS Working Paper, Cardiff University, UK.

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