

REVIEWED PAPER

33rd WEDC International Conference, Accra, Ghana, 2008**ACCESS TO SANITATION AND SAFE WATER:
GLOBAL PARTNERSHIPS AND LOCAL ACTIONS****What's going on?
Exploring drinking water practices as an outsider***C. Furlong & C. A. Paterson, UK*

Understanding existing drinking water practices is essential when trying to implement an improvement programme. Gaining this information can be particularly difficult for 'outsiders'. This paper describes how using a mixed methodologies (or triangulation) approach, utilising both qualitative and quantitative methodologies, provides a deeper understanding of the situation. It highlights how qualitative and quantitative research in this instance is symbiotic providing depth and context to the data. The qualitative ethnographic results were used to question, validate and clarify the quantitative questionnaire results. Through this approach a number of interesting drinking water practices were identified in the case study area, Bellavista Nanay, Peru.

Background

Understanding existing drinking water practices within a community is essential when trying to implement any drinking water improvement programme. Many programmes have failed due to a lack of this baseline information (Biswas *et al.*, 2005, Singh, 2006). Trying to gain an understanding of drinking water practices can be very difficult as they can be complex and changeable. This is particularly true if the researcher is from outside the community that they are working with (they are an 'outsider'). In this study, qualitative and quantitative methodologies were used to study drinking water practices within a community (Bellavista Nanay, Peru). A discussion on the results from the different methodologies (qualitative and quantitative) will be presented together with the findings, conclusions and recommendations for studying drinking water practices.

Case study area

The community of Bellavista Nanay was chosen due to strong links with a community leader ('Gatekeeper') and the perceived problem that although the community had access to municipally treated water, they continued to drink river water. Bellavista Nanay is a peri-urban community 5 km north of the city of Iquitos in the Peruvian rainforest. A water treatment plant supplies the city and surrounding areas such as Bellavista with an inconsistent and unequal municipally treated water supply (Tickner and Gouveia-Vigeant, 2005, Furukawa, 2005). Water related diseases (such as malaria, dengue and yellow fever, cholera, bacteriological, viral and protozoan diarrhoeal diseases) are prevalent due to the climate, landscape and water practices within this area (Guarda *et al.*, 1999, Hayes *et al.*, 1996).

Collection of data

A Gatekeeper was used to introduce this study to the community, which aided data collection. The Gatekeeper was a non-indigenous community leader who had been working within the community for over eight years. Qualitative and quantitative approaches were used to collect information from this community. The quantitative approaches included a questionnaire and qualitative approaches included observational notes, photographs and unstructured interviews. The data was collected over a two month period from June to July 2006.

Quantitative methodology: Questionnaire

A questionnaire was designed, piloted, modified and undertaken in Bellavista Nanay. Every third house in the community was asked to participate in the study (non participation was noted). The person responsible for the water management in the household was targeted. The questionnaire was administered between the

hours of 3 and 6 pm and from Monday to Thursday, was in the form of an interview and aided by a trained local field assistant. A detailed questionnaire was needed due to the lack of information available about the community in general and because household drinking water practice cannot be treated in isolation, but must be studied within the wider context of socio-economic factors, education, water, sanitation and health.

Qualitative methodology: Ethnography

A field diary was kept, in which observational data on drinking water practices were noted. Extra information that participants gave during the questionnaire was also recorded. Conditions that may have influenced drinking water practices, such as when it rained and for how long, were described. Conversations and answers to direct questions that came up during the study were recorded. Photographs were taken of the people, water and drinking water practices in the community.

Results and discussion

It was thought that the Gatekeeper to the community was knowledgeable about the water practices and issues within the area. It was not initially acknowledged that the Gatekeeper was also an outsider with high socio-economic status and had different knowledge and views on these issues than the other participants of the study.

Quantitative results: Questionnaire

The questionnaire method is favoured by scientists and engineers because it generates data that can be explored through statistical methods. The validity of using this method is rarely questioned.

General information

The response rate for the questionnaire was 80%, giving a total of 117 completed questionnaires. The average size of households surveyed was 6.5 people. The average age of the respondents was 38 years, with ages ranging from 16 to 79 years. A majority of those responsible for the household management of water were women (89%) and over half of the respondents classified themselves as housewives (67%). 40% of the respondents had completed their secondary education. Nearly all of the respondents owned their houses (97%) and a majority had lived in the same house for over five years (71%). A high percentage had electricity (88%) and television ownership was high (76%), but only 20% had access to tap water. The sanitation situation in this area was very grave as there was no wastewater treatment or sewers. Half of the households had inside toilets (50%) and a further 25% had private latrines, but 11% of the households used public latrines and a further 14% defecated in the open air.

The low priority of water and sanitation on the political agenda in low, middle and high income countries is widely recognised (United Nations Development Programme, 2006). The high levels of electricity connections, TV and radio ownership compared with connections to the municipal water supply and investment in sanitation is symbolic of the low priority that water and sanitation also has within this community.

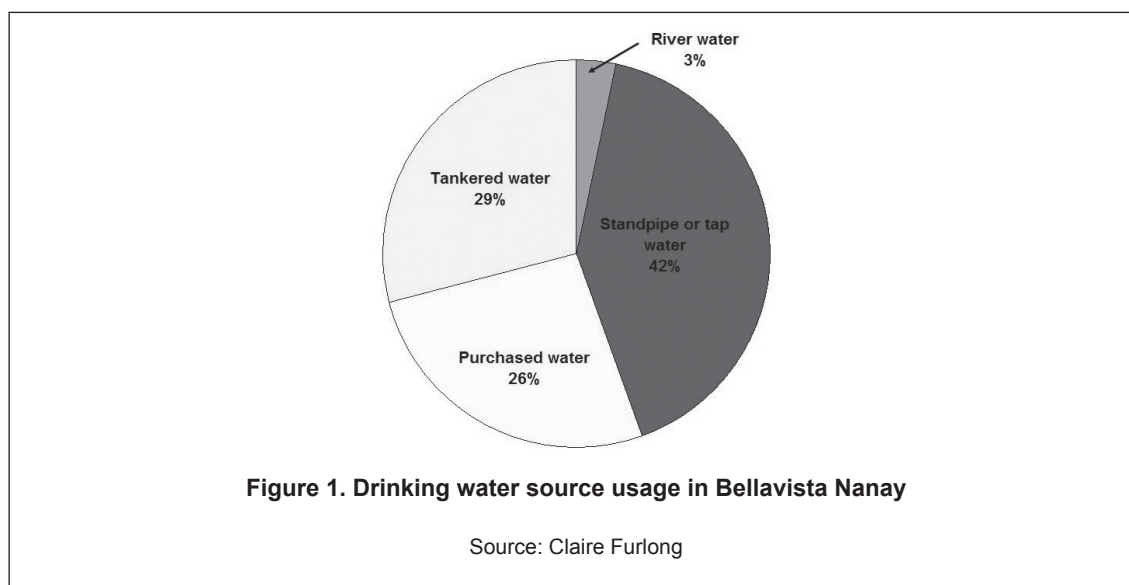
Drinking water practices

Three drinking water sources were initially identified within this community through the Gatekeeper: river water, rainwater and standpipe or tap water. The community was chosen for this study on the basis that the population was thought to drink water from the river rather than the municipally treated standpipe or tap water. Through the questionnaire, a total of seven water sources were identified as being available in Belavista Nanay (water from a tanker, river water, rainwater, spring water, well water, standpipe or tap water, and water purchased from vendors). However, only six of these were considered to provide drinking water. At the time of the questionnaire, only four of these water sources were actually being used as sources of drinking water: river water, water from a standpipe or tap, water purchased from a vendor and water from a tanker. This would suggest that within this community different water sources were being utilised during different times of the year, due to the unreliability of the sources. There was also a clear distinction by the respondents between water for drinking and water for other uses. The drinking water source usage in Belavista Nanay at the time of the questionnaire is summarised in Figure 1.

A high number of respondents used standpipe or tap water as their main drinking water source (41%), but only twenty respondents said that they had access (either within their household or through a relative, neighbour or friend) to standpipe or tap water. Using the data from a combination of questions, an informal trade in water was discovered. Of those that had access to or used standpipe or tap water as their main source of drinking water (n=50), only 14 were paying the municipal water company directly for their water.

Over half of respondents paid for their drinking water either from a standpipe or tap supply or purchased bottled water. Drinking water that was free to this community was river water and water from the water tanker supplied by the local water company.

A majority of the respondents stored their drinking water in buckets (97%). Just over half of the respondents treated their drinking water within their house (54%). The main treatment method was chlorination (71%), but boiling (36%) and filtration (2%) were also used.



Qualitative results: Ethnography

Initially it was thought that the ethnographic results could be used in isolation from the questionnaire results and a comparison of methods could be made. However, it was found that the methods were symbiotic e.g. information from the questionnaire was clarified through the ethnographic results.

The ethnographic work did not uncover any sources of spring water therefore the validity of this result from the questionnaire should be questioned, but it must be highlighted that only one respondent identified this as a source of water within the community.

Even in the Gatekeeper's household, the separation between water for drinking (vendor purchased water) and water for other uses (a mixture of rainwater and municipally supplied water) could be clearly identified, and it was apparent that the drinking water situation was more complex than originally thought. More evidence of rainwater harvesting within the community was found. People were observed washing out their containers with the first rain and then leaving them out to collect rainwater which flowed from their roofs. A few houses were seen to have guttering and sophisticated rainwater harvesting systems. Some were even designed for water to be collected in the centre of the household (observed while carrying out the questionnaire).

People were observed to be washing their clothes in the river during daylight hours. At 5.30 pm a stream of people with containers would be seen walking down the main street (Avenida la Marina) to the river at the north of the settlement. One would easily assume that they were going to collect water, but they were actually going to the river to bath, using containers either for aiding bathing or for carrying water back for relatives who were unable to get to the river. Very few people were found to drink the river water, as confirmed by the questionnaire (Figure 1).

Drinking water collected from the river or water tanker was free. The water tanker was sent by the municipal water company (EPS SEDA Loreto S. A.) to the community, because water pipes could not be laid in the sand substrate beneath parts of the community. The drinking water from the standpipe or tap supply was known to be contaminated along the distribution system. One informant stated "...it is the pipes that are dirty" (trans. from Spanish). The parts of the community with access to tap or standpipe water only received water for one to two hours per day, generally in the early hours of the morning. A few relatively affluent households had installed above or under ground collection tanks, but in most households the person responsible for water management would get up early to collect the water. During the study, the tap water supply was interrupted for three weeks (8th to 27th July), which was generally thought to be due to a valve

failure. The cost for connection to the municipal water system was 95 Nuevo Soles (approx. UK £14.50), this did not include equipment required for the connection. The water was not metered and cost 20 Nuevo Soles per month (approx. UK £3.00).

The collection of water from the tanker was quite a stressful event for the household water managers. The water tanker only delivered to the main concrete street (Avenida la Marina), as other streets in the community were inaccessible by large vehicles. It would generally arrive twice per week, but at unspecified days, times and stopping locations, so the household water managers had to look out for the tanker and be ready to rush out with their containers at any time.

There were three types of purchased water: shop purchased water, purchased sealed delivered water and purchased unsealed delivered water. The shop purchased water was sealed, in bottle sizes of 0.5 to 2 litres and came from various producers. The labelling on the water was very elusive and did not state whether it was mineral water or treated water, nor where it was bottled. This water cost approximately 2.0 Nuevo Soles for 2 litres (approx. UK £0.15 per litre). The other purchased waters were delivered to the household door in larger containers (15 litres). The purchased sealed delivered water was supplied by a prearranged delivery from numerous companies in the city and it was stated on the container that it was “water for the table” (trans. from Spanish), but no other information was given. This water was delivered by a van and cost 2.0 Nuevo Soles per container (approx. UK £0.02 per litre). Even less information was given about the purchased unsealed delivered water and consumers did not know the origin of this water. This water was sold daily by vendors on tricycles and cost 0.50 Nuevo Soles (approx. UK £0.005 per litre).

Approximately ten artisan wells were noted in the area, all on the side streets that run perpendicular to the main Avenida la Marina. One of the wells had a pump installed, serving the house built on stilts above it. The wells were situated on land prone to flooding, and therefore also prone to contamination, as pit latrines were located in sight of the most of the wells. Well water use was limited to washing and cleaning and was not considered by the respondents to be a drinking water source, as confirmed in Figure 1.

The drinking water from all sources was stored in the household before consumption. Tankered water was stored between two to four days and tap water was generally stored overnight. Even water purchased from vendors was not purchased on a daily basis. Water was stored in large buckets and bins, which were generally kept covered, due to the apparently successful education received in the community about good practice in preventing dengue fever. The water was generally dispensed within the household using a jug kept on the lid of the storage container.

Conclusions

The combination of ethnographic and questionnaire data revealed that the drinking water practices in Bellavista Nanay were more complex than originally thought. The community of Bellavista Nanay were choosing from seven sources of drinking water. A distinction between water for drinking and water for other practices was seen from both the questionnaire and ethnographic results. An informal trade in water was discovered through the questionnaire and confirmed through observations.

The successful collection of a relatively large amount of data over a short period of time can be attributed to the methods adopted, including using a Gatekeeper to the community and carrying out questionnaires by structured interviews using local field assistants. Embedding the researcher within the community allowed for ease of approach to the sensitive subjects encompassed within water and sanitation.

The symbiosis of the methods has enabled the authors to gain a more comprehensive overview of the drinking water practices within this community compared with using a single method. The ethnographic research added depth to the study, which could not have gained through a questionnaire alone. Many people are passively using ethnographic methods, but by embracing this method more fully, a greater depth of understanding can be gained.

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Note

This work is part of a larger study of the link between perceived and actual drinking water quality within communities. Further work in the community of Bellavista Nanay was undertaken in 2007.

Keywords

Peru, drinking, water, practices, methodology, questionnaire

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