

Farmers' Perceptions of Benefits and Risks from Wastewater Irrigation in Accra, Ghana

Kafui Adjaye-Gbewonyo

As safe water sources become scarcer and more polluted, the use of wastewater in urban agriculture may produce many benefits but may also lead to crop and soil contamination and endanger farmers and consumers. To effectively manage wastewater use in agriculture, it is important to understand how stakeholders feel impacted by the practice. .

Urban farmers are of special importance as they are the ones converting wastewater into a resource, creating benefits and risks not only for themselves but for consumers, their communities, and the environment. In 2006, twenty drain-water users and twenty-two pipe-water users were surveyed at six farming sites in Accra. To evaluate farmers' perceptions of risks from wastewater irrigation, farmers in Accra, Ghana, who use pipe-borne water for irrigation were compared with those using drain water and waste-polluted streams. Farmers were asked about their farming practices, inputs, production, demographic information, perceptions, and general health during the past year. The responses from the group of drain-water users and the group of pipe-water users were compared statistically.

Results

Malaria was the most commonly reported illness among the farmers (63.4 percent of the respondents reported having had it within the past year), followed by body pains (14.6 percent), fatigue (14.6 percent), and headache (7.3 percent). Only one farmer reported gastrointestinal illness, and this farmer used pipe water for irrigation. Only the reporting of malaria showed significant differences between the two groups of farmers; 77.3 percent of the pipe-water users reported having had malaria over the past year, as compared to 47.4 percent of drain-water users. Otherwise, no significant differences were seen in the proportions of drain- and pipe-water irrigators reporting other illnesses.

Differences were observed between pipe- and drain-water users' perceptions about their irrigation water. A significantly larger proportion of drain-water users (63 percent) considered their irrigation water supply to be reliable, whereas just 19 percent of pipe-water users deemed their water supply reliable since it is often shut off by the water providers. As a result, many pipe-water irrigators store water in open reservoirs or shallow pools dug in the ground and draw their irrigation water from these pools with watering cans.



Farmer using watering cans for irrigation
Photo: Sangare Drissa

Higher proportions of pipe-water users than drain-water users, in some cases significantly so, felt their irrigation water affects their crops or soil, farming revenue, and health in a different manner than do other water sources. When pipe-water users were asked whether they believed their crops and soil were affected differently by pipe-borne water than by other water supplies such as drain water, 80 percent of the respondents said yes. When asked this question with respect to their farming revenue, 56 percent said yes, and with respect to their health, 40 percent said yes while one respondent was unsure. Most of the pipe-water users perceived these effects to be positive in comparison to using drain water or other sources. Some of the explanations given were that pipe water prevents disease and that crops cultivated with pipe water are fresher, more hygienic, of better quality, or preferred by customers. A few pipe-water irrigators did claim, however, that drain water is better for crops because it has more nutrients.

In contrast to the pipe-water users, most of the drain-water users did not believe that their irrigation water affects their crops,

farming revenue, or health in a different manner than pipe-borne water or other water sources do. Only 41 percent of respondents perceived an effect on their crops and soil (two respondents were unsure), 14 percent on their farming revenue, and 16 percent on their health. However, of the drain-water users who did perceive an impact on their crops and soil, most believed this impact was positive, such as through nutrients, improved crop growth, or the absence of chlorine; but a couple of drain irrigators mentioned negative impacts on either their crops or sales. Healthwise, while two drain-water farmers said they had experienced skin irritation from their irrigation water, others stated that taking common precautions such as washing after work prevents illness. Two other drain-water users stated that although the media or “learned” people talk of health risks from using drain water for irrigation, they had not experienced any such problems.

Discussion

This study found most types of illnesses reported by both drain-water users and pipe-water users to be similar, suggesting that other sources of illness may overshadow those presented by farmers’ contact with irrigation water. Interestingly, in Ouagadougou where the health perceptions of urban farmers were compared with those of their non-farming neighbours, significant differences could not be found either (Gerstl, 2001). However, the results from the present study do not mean that differences do not exist. A survey by Amoah (2003), found a higher incidence of diarrhoea, fever, and headaches among Accra farmers using polluted irrigation water versus those using non-polluted water. It is also possible that some farmers regard certain health problems (e.g. gastrointestinal problems) as not serious enough to report. Additionally, farmers’ answers might have been biased to justify the use of their water sources. Because this was only a pilot study, more farmers will need to be interviewed and more detailed data collected before sound conclusions can be made. Nonetheless, it was evident that even those farmers who were aware of potential health risks of using untreated water for irrigation did not value these risks high, i.e. they seemed willing to accept these risks because of the benefits gained from drain water and the unavailability of other water sources.

The difference observed in the reporting of malaria between the two groups of farmers raised questions. It could indicate that the locations in which many of Accra’s pipe-water irrigators farm or live are more prone to malaria-transmitting mosquitoes. It could also suggest that the small storage ponds (about 0.5 m³) used by pipe-water irrigators provide a more suitable breeding ground for mosquitoes, while wastewater pools are known as unsuitable breeding grounds. However, other studies have shown that natural predators and other known competitors (tadpoles) effectively controlled mosquitoes’ larval development in such freshwater pools on farming sites in Accra (Miah 2004). The possible link between irrigated urban agriculture and malaria has been studied by the International Water Management Institute (IWMI) in Kumasi and Accra (Afrane et al. 2004; Klinkenberg et al., 2005), but as yet no explicit link between malaria and local farming activities has been established.

Challenge ahead

While more detailed research is needed to better understand the issues discussed here, we observe that farmers are increasingly



Polluted stream/drain used for irrigation
Photo: Kafui Adjaye-Gbewonyo

becoming tired of participating in surveys and long interviews that provide no benefits for them. There is also always the fear of too much official attention being paid to the as yet illegal practice of drain water irrigation.

Nevertheless, increased government involvement in the ongoing studies on consumer health risk mitigation could lead to more supportive policies and, for example, increased land tenure security. Also, more collaboration among researchers is necessary to avoid duplication in research. Data from previous and ongoing studies could be compiled and stored in a database and made available to researchers, as is being initiated by IWMI for the RUAF and SWITCH projects in Accra.

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Kafui Adjaye-Gbewonyo, Harvard University,
Email: KafuiG@post.harvard.edu

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