



# Safeguarding public health from farms to markets to households

Exploring ways to minimize the public health risks from wastewater irrigation while protecting the livelihoods of poor urban farmers.

■ Research Highlight #7





## ■ Urban and peri-urban agriculture, wastewater irrigation and public health

Urban and peri-urban agriculture (UPA) is becoming an important livelihood activity in developing countries, as fast-growing urban populations demand more food and water. UPA contributes to urban food security—in several African cities, between 50 and 90 percent of the vegetables consumed are produced in city backyards or just outside the city limits in small farms. But growing demand for industrial and domestic water needs is leaving farmers with little alternative but to use some of the

large volumes of wastewater released from urban areas for irrigation.

In Ghana and Burkina Faso, the pressure from urban centers dependent on water resources from the Volta basin has made wastewater use in UPA a common practice. In many parts of the basin, wastewater is the only available surface water for irrigation in the dry season and a reliable nutrient-rich source that secures the livelihoods of farmers engaged in UPA.



*Farmer fetching water from a pond contaminated by run-off poultry manure*

Untreated wastewater used for vegetable production poses serious public health risks. Faecal matter and industrial effluents in wastewater can contaminate crops and water sources and cause diseases. 'Safeguarding public health concerns, livelihoods and productivity in wastewater irrigated urban and peri-urban vegetable farming in Ghana and Burkina Faso', a project of the Challenge Program on Water and Food (CPWF), is exploring ways to minimize these public health risks from wastewater irrigation while protecting the livelihoods of poor urban farmers. The project works in and around three urban centres that are located in, or draw resources from, the Volta river basin.



Photo: IWMI, Ghana

Sand filter trials

### The contamination pathway

To tackle the several 'entry points' to minimizing crop contamination and health risks to farmers and consumers, the project looks at contamination conduits from the farms, to markets, restaurants, and households. At each level along the contamination pathway, the level of risk will be assessed with particular emphasis on understanding the post-harvest contamination and decontamination of wastewater-irrigated crops in relation to typical handling and cleaning methods in markets and households. Local perceptions of practices and factors that influence environmental health risks will also be analysed to provide a basis

to build on when proposing new strategies and interventions. Laboratory analysis will assess the levels of contamination and decontamination caused by transport, storage, marketing ('refreshing') and washing in households and restaurants. To support these efforts, the twin CPWF project 'The impact of wastewater irrigation on human health and food safety among urban communities in the Volta Basin – opportunities and risks' is identifying who actually consumes wastewater irrigated vegetables since it is often perceived that very little of what is grown is consumed by the producers.

### Integrated user-oriented strategies

The project takes a multidisciplinary approach that will consider the biophysical, technical, socio-economic and institutional elements of safeguarding public health while preserving livelihoods. Integrated user-oriented strategies examine land and water-use practices, as well as pollution and contamination levels and sources, to formulate innovative methods that will reduce health risks. These include, studying the feasibility of alternative water sources such as shallow wells, pipe water and water lifting devices and testing low-cost on farm wastewater treatment methods such as sedimentation ponds, sand filters, and filters connected to pumps in field trials. Other strategies include working with farmers to explore irrigation practices and cropping patterns that would reduce their exposure to polluted water.

Parallel activities assess the level of awareness and perceptions of water pollution, vegetable contamination amongst stakeholders and discuss options to safeguard health. Participatory approaches and knowledge sharing activities are helping to understand the farmers' concerns, improve links between institutions and, most importantly, arrive at a shared understanding of the various dimensions of the problem. Through this approach, the project's research design reflects the perspectives and needs of all stakeholders, including wastewater management agencies, local authorities, and associations representing farmers, sellers and consumers.

## Can we reduce health risks without compromising livelihoods?

Simply banning the use of wastewater irrigation is not the solution as long as alternative water sources are limited and the livelihoods of urban farmers are reliant on it. In recognition of this, municipalities in Ghana are seeking assistance from the research community on a campaign for 'Safer Vegetables for Healthier Cities'. The project is being supported by the WHO to find a balance between livelihood and health

concerns by revising guidelines on the safe use of wastewater in irrigation. Studies will contribute to formulating risk-reducing guidelines not yet covered by the WHO. The guidelines will help stakeholders, especially local authorities, to make decisions. Moreover, technologies that are developed and tested through the project will benefit other wastewater projects underway in developing countries and other CPWF basins.



Photo: IWMI, Ghana



Photo: IWMI, Ghana

◀ Wastewater vs pipewater crop

Greater collaboration between researchers from various disciplines and project activities in the various locations yield lessons that help to understand the problem in different environments and situations.



CGIAR Challenge Program on  
**WATER & FOOD**

### **Challenge Program on Water and Food Secretariat**

P.O.Box 2075, Colombo, Sri Lanka  
Tel: +94-11-2787404, 2784080 Fax: +94-11-2786854  
Email: [cpsecretariat@waterforfood.org](mailto:cpsecretariat@waterforfood.org)  
Web: [www.waterandfood.org](http://www.waterandfood.org)

## **Contacts**

**Project leader:** Dr Robert Abaidoo  
Kwame Nkrumah University of Science and Technology  
Email: [r.abaidoo@cgiar.org](mailto:r.abaidoo@cgiar.org); [rcabaidoo@yahoo.com](mailto:rcabaidoo@yahoo.com)

## ■ Project information

CPWF Project  
Safeguarding public health concerns, livelihoods and productivity in wastewater irrigated urban and peri-urban vegetable farming in Ghana and Burkina Faso

## ■ Partner organizations

- Kwame Nkrumah University of Science and Technology (KNUST), Ghana
- University of Development Studies (UDS), Ghana
- International Water Management Institute (IWMI)
- Centre Regional pour l'Eau Portable et l'Assainissement a Faible Cout (CREPA), Burkina Faso
- Water Research Institute (WRI) – CSIR, Ghana