

Addressing Public Health Issues in Urban Vegetable Farming in Ghana



HIGHLIGHTS

- ✓ Farmer and food vendor knowledge regarding health risks and implementation of risk reduction measures for increased food safety have increased
- ✓ National irrigation policy revised to reflect new stance on potential benefits of wastewater re-use
- ✓ The new Ghana Environmental Health Platform continued the work started by local universities and CPWF partners

Outcome Stories

Vegetable growers in and around Accra, Ghana's capital, have felt their livelihoods being threatened by a city bylaw banning the use of polluted drain water, their main source of irrigation. Using diluted wastewater is a common practice in urban and peri-urban agriculture in sub-Saharan Africa and other low-income countries, and is known to pose health risks to people.

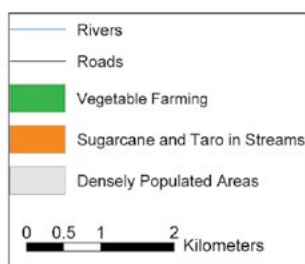
CGIAR Challenge Program for Water and Food (CPWF) Project Number 38 "Safeguarding public health concerns, livelihoods and productivity in wastewater irrigated urban and peri-urban vegetable farming," supported by the International Water Management Institute (IWMI), built on past work by

local universities in an effort to find solutions to reduce health risks without compromising the livelihoods of the producers and the health of the consumers.

Reducing health risks from irrigation water

Farmers were generally aware that the water they used was contaminated. Their knowledge of health risks resulting from direct exposure to wastewater from irrigation was however, quite low. They took few precautions on their farms to reduce those risks.

Food vendors paid attention to visible dirt but not to invisible risks. Their vegetable



Vegetable producing sites in central Accra

washing methods were found to be largely ineffective in reducing contamination.

Researchers came up with simple but effective solutions to address such problems both on the farm, at markets and in the street food sector where most leafy vegetables are consumed.

Farm level interventions included low-cost water treatment methods and safer irrigation practices. Post-harvest measures entailed different washing methods and the use of different kinds and concentrations of disinfectants.

Sedimentation ponds and filtration using sand filters were tested and found to reduce helminth eggs to acceptable levels. Lowering the watering height and using a rose or spray head on the watering reduced helminth egg and coliform counts.

Simple adjustments in water practices, such as reduced splashing from the soil to the vegetables, lowered contamination levels. Cessation of irrigation before harvesting was also effective, with longer periods being more effective, though some yield reduction was noted.

Besides contamination with coliform and helminth eggs, vegetables in the markets contained pesticide residues. Market level interventions of the project included the removal of the outer leaves, storing them in well aerated baskets, and sprinkling of displayed vegetables with clean water.

Translating research into wider scale practice

Interventions in the street (fast) food sector focused on appropriate vegetable washing. The interventions were tested for their adoption potential with about 60 % of urban vegetable farmers in the study sites, about 60 lead vegetable sellers, and

A section of Agbogbloshie market showing vegetables displayed on the ground



Photo: IWMI

more than 300 street food vendors and caterers. Their knowledge regarding health risks and risk reduction measures increased considerably.

An increasing number of farmers have begun using sedimentation ponds and safer water application techniques, although follow up training is still awaiting financial support.

Traders are practicing safer handling practices and food vendors are making changes in their vegetable washing techniques.

These low-cost measures showed varying potentials for risk reduction, but used in combination they are significantly more effective in ensuring food safety.

Various kinds of awareness-raising and training materials aimed at different stakeholders were produced.

The project helped establish strong working relationships with farmers' organizations and networks of farmers and food sellers.

This led to various follow up projects (e.g. by WHO, IDRC and FAO) and the founding of the Ghana Environmental Health Platform, which continues the work started by local universities and CPWF partners.

Project researchers were also asked to provide inputs to the WHO guidelines for wastewater use in agriculture.

In close collaboration with the Resource Centre on Urban Agriculture and Food Security (RUAF), researchers initiated the revision of the Accra bylaws banning the use of polluted drain water.

In 2010, the national irrigation policy was launched, which stated that, with

"About 800 million people are engaged in urban and peri-urban agriculture (UPA) worldwide, contributing about 30% to the world's food supply (UNDP 1996).

UPA is an effective way of alleviating poverty. It provides jobs for the poor. In Africa 65% of the people involved in UPA as farmers or traders are women."

certain precautions, the re-use of wastewater could be beneficial.

Now Accra's urban vegetable farmers can continue to make a living, while helping ensure the city's food security.

Most Significant Innovations

1. Health risk reducing options tested and verified on farm, in markets and in the fast food sector.
2. Advice to WHO on options for risk reduction using a multi-barrier approach from farm to fork as per WHO guidance.
3. FAO using the results for the production of farmer field school modules.
4. Influence on Ghana National Irrigation Policy.

References

Abaidoo, R.C., Keraita, B., Amoah, P., Drechsel, P., Bakang, J., Kranjac-Berisavljevic, G., Konradsen, F., Agyekum, W., and A. Klutse. 2009. *Safeguarding public health concerns, livelihoods and productivity in wastewater irrigated urban and peri-urban vegetable farming*. CPWF Project Report PN38. Colombo, Sri Lanka: CGIAR Challenge Program on Water and Food. http://results.waterandfood.org/bitstream/handle/10568/3925/PN38_KNUST_Project%20Report_Nov09_final.pdf?sequence=1

Amoah, P., Keraita, B., Akple, M., Drechsel, P., Abaidoo, R.C., and F. Konradsen. 2011. *Low-cost options for reducing consumer health risks from farm to fork where crops are irrigated with polluted water in west Africa*. IWMI Research Report 141. Colombo, Sri Lanka: International Water Management Institute. http://www.iwmi.cgiar.org/Publications/IWMI_Research_Reports/PDF/PUB141/RR141.pdf

Drechsel, P., Scott, C.A., Raschid-Sally, L., Redwood, M., and A. Bahri. 2011. *L'irrigation avec des eaux usées et la santé: Évaluer et atténuer les risques dans les pays à faible revenu*. IDRC and IWMI. Quebec City, Quebec: Presses de l'Université du Québec, Canada. http://www.iwmi.cgiar.org/Research_Impacts/Research_Themes/Theme_3/PDF/French%20book.pdf

Drechsel, P., Scott, C.A., Raschid-Sally, L., Redwood, M., and A. Bahri (eds.). 2010. *Wastewater irrigation and health: Assessing and mitigation risks in low-income countries*. IDRC and IWMI. London, UK: Earthscan. http://www.iwmi.cgiar.org/Publications/books/pdf/Wastewater_irrigation_and_Health_book.pdf

Obuobie, E., Keraita, B., Danso, G., Amoah, P., Cofie, O.O., Raschid-Sally, L., and P. Drechsel. 2006. *Irrigated urban vegetable production in Ghana: Characteristics, benefits, and risks*. IWMI, RUA, IDRC and CPWF. Accra, Ghana: IWMI. http://www.iwmi.cgiar.org/Publications/Books/pdf/Irrigated_Urban_Vegetable_Production_in_Ghana.pdf

Project Partners

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About CPWF Outcome Stories
 The CPWF Outcome Stories document changes in knowledge, attitudes and practices that have emerged through CPWF-funded research. Outcomes occur when research outputs foster engagement processes that result in changes in practice or changes in behavior. These stories capture outcomes at a specific point in time; outcomes may have evolved since the completion of these projects.



Andes • Ganges • Limpopo • Mekong • Nile • Volta

About CPWF

The Challenge Program on Water and Food was launched in 2002. CPWF aims to increase the resilience of social and ecological systems through better water management for food production (crops, fisheries and livestock). CPWF currently works in six river basins globally: Andes, Ganges, Limpopo, Mekong, Nile and Volta.

CPWF is a member of the CGIAR Water, Land and Ecosystems Research Program. The program focuses on the three critical issues of water scarcity, land degradation and ecosystem services, as well as sustainable natural resource management. CGIAR is a global agriculture research partnership for a food secure future. Its science is carried out by the 15 research centers who are members of the CGIAR Consortium in collaboration with hundreds of partner organizations.

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