

Safeguarding Public Health from “Farm to Fork”

Minimizing the health risks of consuming vegetables
irrigated with wastewater



The Challenge: Poor Sanitation and Water Pollution

In and around African cities, many irrigation water sources are heavily polluted with untreated urban wastewater and runoff. Due to the high costs involved appropriate wastewater treatment is not a feasible option for many municipalities.

How are Consumers Affected?

Exotic vegetables, like lettuce and spring onions, which require irrigation, are consumed uncooked in salads or other dishes.

Laboratory analysis showed that the vegetables have high levels of microbiological contamination above the acceptable limits. Eating contaminated salad can result in worm infections,



Leafy, nutrient-rich vegetables are produced in urban and peri-urban areas.

diarrhea and other diseases. This can be a serious risk factor, especially for children, people prone to illness and those not used to local conditions, like tourists.



IWMI and partners are developing integrated strategies to safeguard public health while sustaining the urban food supply of perishable vegetables.

Risk Management

Banning polluted water use has failed as this threatens the city supplies of leafy, vitamin- and nutrient-rich vegetables, which are essentially produced in urban and peri-urban areas. It also threatens the livelihoods of poor vegetable farmers, traders and wholesalers. As long as authorities cannot provide alternative (safer) irrigation water sources, other options for risk management are required.

Fortunately, there are alternatives especially where health implications relate mostly to microbiological risks, such as diseases causing bacteria, and not chemical risks, like heavy metals.

Goal of the Project

To develop integrated strategies to

- (i) safeguard public health,
- (ii) support urban and peri-urban agriculture and related livelihoods and
- (iii) sustain urban food supply with perishable vegetables.

From “Farm to Fork”

The Research Approach

Water pollution and crop contamination levels were analyzed from wastewater sources to farms, markets and consumers, in order to identify where food contamination takes place as well as the best entry points for health risk reduction.

The project is exploring possibilities for alternative cropping areas and safer water sources. But even where this is not possible and where wastewater treatment remains insufficient or absent, consumers can be protected through different low-cost measures:

- **On-farm**, through safer irrigation techniques, improved shallow wells, low-tech water filters, simple water treatment, and sedimentation methods.
- **In formal and informal markets** through provision of clean water for vegetable washing and “refreshing”, appropriate sanitation and good hygiene,
- **In household kitchens or street restaurants** through efficient vegetable washing using verified local practices.

Research will quantify the degree of risk reduction for each option to recommend best practices. Awareness will be raised through active stakeholder involvement in the project and through the development of training modules, TV spots and others.



Only washing vegetables with the correct salt solution can reduce health risks.

Project Partners

- Municipality of Accra,
- Ministry of Food and Agriculture, Ghana,
- Kwame Nkrumah University of Science and Technology, Ghana (lead institute CP38),
- University of Development Studies, Ghana;
- University of Copenhagen (lead institute CP51),
- Royal Veterinary and Agric. University, both in Denmark,
- Centre Régional pour l'Eau Portable et l'Assainissement à Faible Coût, Burkina Faso;
- Water Research Institute, Ghana,
- EnterpriseWorks,
- Council for Scientific and Industrial Research, Ghana,
- IDRC, RUAF, Urban Harvest etc

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Beneficiaries

While the ultimate target group of the project is the consumer of uncooked vegetables, the authorities in charge of urban agriculture, food safety and public

health will benefit from an integrated approach for a complex problem.

Urban and peri-urban farmers will benefit from training, and so will vegetable sellers who are in, most West African countries, solely women.

The new WHO wastewater irrigation guidelines will be strengthened through tested risk-reduction measures, which go beyond wastewater treatment at its source or restrictions for farmers.

Project Outputs

1. Information base on land and water use practices, water pollution and vegetable contamination.
2. Set of verified health risk reduction practices and strategies, indicating their adoption potential and constraints.
3. Guidelines, awareness materials and training modules for various stakeholders.
4. Strengthened African capacities through North-South university partnerships.