



Third edition of the Guidelines for the Safe Use of Wastewater, Excreta and Greywater in Agriculture and Aquaculture

**NON-TREATMENT OPTIONS FOR SAFE WASTEWATER USE
IN POOR URBAN COMMUNITIES**

Briefing note on on-going FAO/WHO/IDRC research in West-Africa and Jordan

Introduction

In terms of methods and procedures, the third edition of the *Guidelines for the Safe Use of Wastewater, Excreta and Greywater in Agriculture and Aquaculture* represents an important departure from the previous edition. The third edition no longer focuses exclusively on rigid wastewater quality norms to be applied at the point of irrigation. Rather, it proposes a combination of performance indicators and guideline values, supported by the Stockholm Framework. This Framework encompasses a process of hazard identification and risk assessment along the entire wastewater chain -from its generation to the consumption of produce grown with it-, establishment of health-based targets (WHO proposes an added risk of no more than 10^{-6} DALYs lost), the design of adequate and affordable cumulative health management measures to meet the targets agreed and the establishment of an effective monitoring programme.

Clearly, this new approach calls for greater efforts by all parties with an interest in the safe management of wastewater, excreta and greywater, and by regulators in particular. To support such efforts additional capacity building is needed. New legislative and regulatory frameworks will have to be developed, and existing ones will need review and adjustment. The group of stakeholders directly involved in risk assessment measures will have to be expanded and strengthened, through institution building and new institutional arrangements. Such arrangements will have to be created between public sectors as well as between different professional associations and NGO groups. And the human resource base to support the implementation of essential functions will require education, training and the development of new skills.

The project

In 2005, the World Health Organization, the Food and Agriculture Organization of the United Nations and the Canadian International Development Research Centre (IDRC) joint forces in a research project to study the opportunities and constraints associated with the practical implementation of the Guidelines by national authorities. The ultimate goal is to document these experiences and to publish practical guidance on the effective application of the Guidelines. The objectives defined by the international partners are:

- To identify economically, technically and socially appropriate non-treatment options for health protection such as crop restriction, wastewater, excreta and grey water application techniques that reduce levels of exposure to hazards and exposure control measures such as the use of personal protective equipment, hygiene education, food safety measures etc as promoted by the WHO guidelines.
- To study the feasibility and potential effectiveness of the non-treatment health protection measures in reducing the disease burden associated with the use of wastewater, excreta and greywater.
- To increase awareness of the guidelines in the international development community and among national governments.
- To synthesize research findings into a joint WHO/IDRC document that will help low-income countries adapt the WHO guidelines for effective application in their own unique circumstances.

The agreed focus is on poor urban communities in West Africa and the Eastern Mediterranean. Here wastewater use in agriculture is an existing and expanding practice.

A four-member Scientific and Technical Advisory Committee was established with the following membership:

- Dr Guéladio Cissé, Centre Suisse de Recherche scientifique en Côte d'Ivoire (CSRS) in Côte d'Ivoire
- Dr Pay Drechsel, International Water Management Institute (IWMI), West Africa Office, Accra, Ghana
- Dr Siméon Kenfack, Centre régional pour l'Eau potable et l'Assainissement à faible Coût (CREPA) in Bobodioulasso, Burkina Faso
- Dr Seydou Niang, Institut fondamental d'Afrique noire Cheik Anta Diop, Dakar, Sénégal

From eleven concept notes received from institutions in the afore-mentioned regions, five were selected, based on agreed criteria. The submitting institutions were invited to prepare full proposals and, in consultation with the STAC, four proposals were selected: three for support by IDRC/WHO and one for support by FAO:

- Ghana/Kumasi: Evaluation of non-treatment options for maximizing public health benefits of WHO guidelines governing the use of wastewater in urban vegetable production in Ghana.
- Ghana/Tamale: Minimizing health risks from using excreta and grey water by poor urban and peri-urban farmers in the Tamale municipality, Ghana.
- Jordan: Safe use of greywater for agriculture in Jerash Refugee Camp: focus on technical, institutional and managerial aspects of non-treatment options.
- Senegal: Proposition d'étude en vue de l'intégration et de l'application des normes de la réutilisation des eaux usées et excréta dans l'agriculture.

These proposals were the main subject of discussions at the first consultative workshop of the project (Accra, December 2006), where detailed protocols were finalized and valuable exchanges took place between the teams, aimed at ensuring a harmonized and complementary approach in the various settings.

Progress

During the first year of the project (2007) research activities focused on the application of hazard and risk assessment methods and procedures proposed in the Guidelines. As was expected, the different locations with their different physical, social and institutional contexts incurred different challenges to the Guidelines' implementation.

In *northern Ghana*, where the extent of agriculture using human waste around the city of *Tamale* is limited and where the waste used is mainly fecal sludge, the studies thus far have emphasized hazard and risk assessment linked to the protection of local farmers and their families. At the heart of the research activities is the establishment of a reliable and sound information base. This included the epidemiological work on the health status of farmers with respect to excreta- and wastewater-related diseases, and the on-farm pilot testing of possible risk reduction measures. Water and soil sampling provide additional relevant datasets.

Around *Kumasi, Ghana*, the extent of wastewater use in peri-urban agriculture is of a much larger scale than around Tamale, with more diversity in the types of waste used and crops grown. Activities over the first twelve months included:

- Field implementation and demonstrations
- Assessment of perceptions and adoption of key stakeholder groups
- Assessments of economic, financial, health impact, social-cultural and legal feasibilities
- Creation of a platform to effect institutional change
- Assessment of institutional capacity needs

A priority activity by the Kumasi team is the production of an evidence-based field guide on "Food Safety and Personal Hygiene" for use by Farmer Field School (FFS). Such schools provide participatory learning opportunities for farmers. The Ghanaian FFS curriculum will include the non-treatment options for the safe use of wastewater.

A review of institutional arrangements and relevant policies in Ghana identified constraints and opportunities with respect to safe wastewater use at the level of governance, and to assess the implications for the wide application of the third edition of the WHO Guidelines. It identified institutional stakeholders and guiding legislative documents of relevance. A survey of stakeholders and legislation was carried out. The scope of this exercise was defined by urban agriculture, water and sanitation, and farming and food safety. Ninety legislative documents were reviewed.

Findings indicate that legal provisions concerning the safe use of wastewater in agriculture are scattered over several unrelated documents, and that institutional responsibilities are fragmented over different ministries and over different administrative levels (from national to local). They contain few direct references to the Guidelines, but the majority link indirectly to them.

The situation in the *Jerash refugee camp in Jordan* provides a special situation with the use of greywater taking a central place. In 2007, progress was made in two areas:

- Assessment of the current status of greywater use in agriculture and describing the associated health issues among refugees in the Jerash camp
- Review of the existing policies and institutional frameworks regulating the use of greywater with special emphasis on impacts on public health

Based on information collected, surveys carried out and observations made, the following risk assessment hypotheses were developed: at the household level the vulnerable group is mainly that of children playing near greywater canals and risks relate to the lack of hygienic practices. This results in a higher incidence of grey wastewater-related disease (diarrhoea). At the farm level contact between humans and greywater during irrigation and during harvest is more likely than contact related to **crops**. It is this contact that results in increased wastewater-related diseases among farmers.

In the *Pikine area near Dakar* farmers practice small scale horticulture using wastewater, often mixed with groundwater. Preliminary research results show that more than 68% of the farmers use the technique of sprinkling with a watering can to irrigate their crops, which implies a high level of contamination risk; and, that more than 63% of the farmers expose themselves during more than three hours a day to contamination risks, and as the only measure of protection, they clean their hands with bleach.

Next steps

During 2008, all teams will shift to the risk reduction phase of the project, applying the risk management measures designed on the basis of the assessment in phase 1. Such activities are to reveal the optimal measures and best practice in specific contexts, and relate them to the generic Guidelines' recommendations. In all projects, the communities involved will be kept informed, and in some cases local communities will actively participate in this research work.

In Ghana, the research line on policies and regulations will be pursued, with a view to updating existing rules so they reflect the concepts and ideas contained in the third version of the Guidelines.

After the first workshop in Accra and the second workshop in Dakar (December 2007), it is foreseen that the final results will be presented and discussed at a workshop in Amman, Jordan in March 2009.

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