

Safe and Productive Use of Wastewater and Excreta in Agriculture in Low-income Countries

A Roadmap of Key Research Issues for Public Health Impact (DRAFT version)

Accra, October 18, 2008

Background

This short outline of key research issues draws from a large number of research initiatives and projects on urban wastewater use in agriculture in low-income countries as presented at an international expert consultation on invitation of WHO, IDRC and IWMI, Oct 6-9, 2008.

The consultation was the first follow-up to a previous one in 2002 which took place in Hyderabad and produced besides a widely distributed text book (http://network.idrc.ca/es/ev-31595-201-1-DO_TOPIC.html) also the 'Hyderabad Declaration on Wastewater Use in Agriculture' (www.iwmi.cgiar.org/health/wastew/hyderabad_declaration.htm) which highlighted the common reality and livelihood dimension of the use of untreated wastewater in irrigated agriculture and influenced global wastewater use guidelines and research agendas.

For the October 2008 consultation an expanded group of highly regarded professionals from national and international research and donor organizations met in Accra to re-assess the state-of-the-art and research needs for wastewater and excreta use in agriculture in low-income countries, this time with heightened attention to new WHO guideline and ways to improve on risk assessments, risk mitigation (including both treatment and non-treatment options); and wastewater governance to allow for practical engagement with decision makers.

The October 2008 meeting resulted in the Accra Consensus which summarizes the key points of the plenary and working group discussions in Accra. (http://www.iwmi.cgiar.org/Research_Impacts/Research_Themes/Theme_3/Accra_Consensus.aspx).

A more detailed list is provided here. Some topics or questions can be considered short-term topics, others will require longer-term programs to find answers.

We hope that the international research community will adopt the here outlined issues allowing us in 6 years from now to evaluate progress and re-assess the research agenda.

Risk Assessments

- Work towards locally tested dose-response functions to make risk assessments relevant to the situation in developing countries.

- Develop and maintain a website that provides emerging information on risk assessment and mitigation, **and** that serves as a portal to ‘harvest’ data from other researchers and practitioners around the world.
- Identify commonalities and differences in approaches related to environmental impact assessment and health impact assessment in order to develop integrated risk assessments.
- Aim at holistic risk assessments comparing food- and water-borne pathways for diarrhoeal diseases.
- Test local links between common indicator organisms and pathogen occurrence and revise indicators if needed (Norovirus as recommended example).
- Verify if the different routes of transmission account for high incidence of parasites and parasitic protozoa.
- Use available data to address:
 - the validity of E coli transformation of risk to viral and protozoan pathogens (particularly in relation to the WHO Guidelines)
 - risk and consequences of multiple vs. single infections (particularly for vulnerable sub-populations, e.g., individuals with HIV)
- Improve local diagnostic pathogen capacity and ‘ground truth’ QMRA assessments epidemiologically.
- Develop QMRA- assessments for Ascaris and Giardia (using dose-response data from disease-endemic areas)
- Develop typical developing country scenarios ($\leq 10^{-5}$ or $\leq 10^{-4}$ DALY loss pppy) and wastewater use strategies for each of these, to show how the Guidelines can be used in practice to protect the health of the different exposed groups – i.e., a series of “worked examples”

Risk Mitigation, Governance and Policy

- Need to develop country-specific regulations on wastewater reuse and phased implementation while measuring impact.
- Analyze how local perceptions of wastewater and excreta influence the degree of adoption of recommended risk mitigation practices and flexible applications of guidelines.

- Analyze the capacity needs in developing countries (scientific and institutional) to adopt integrated risk mitigation approaches and which decision support tools are required and relevant.
- Even if non-treatment options are shown to reduce risk, assess how “sustainable” their adoption in practical settings is and which incentives etc. are required to enhance their sustainable use.
- Test in case studies how to move from treatment for disposal to treatment for reuse, i.e. how we to better promote policy change towards investments in reuse-oriented sanitation and well targeted risk reduction through research, economic analysis and advocacy.