



Wastewater use in agriculture

FAO Land & Water Division has experience in a wide array of agricultural development projects involving wastewater reuse, water quality and resource planning. The 2006 WHO, FAO, UNEP Guidelines for the Safe Use of Wastewater, Excreta and Greywater support various FAO Country Projects where farmers engaged in urban and peri-urban agriculture can better manage waste and wastewater efficiently and effectively while meeting health objectives for consumers and producers. Wastewater reuse has also been applied in emergency and water scarcity contexts, as response to issues related to access, economics for resource-poor farmers, and the application of the Guidelines aims to improve health and food quality/safety standards. FAO provides the following direct country support to the field in the area of safe reuse of wastewater for agriculture:

- **Wastewater treatment & Reuse**
 - **Multi-Objective Planning**
 - **Effluent Monitoring**
 - **Water & Sanitation Targets**
 - **Improving Water Access**
 - **Producer-Farmers Training**
- Identified risks and benefits associated with the use of wastewater in urban and peri-urban low income producer groups, and developed vegetable cropping systems. Assisted in combining field and laboratory methods and structured interactions with producers, consumers, and authorities of urban planning, public health and water management in safe management of food and food processing through safe use of wastewater in agriculture.
 - Conducted field implementation and demonstrations in Farmer Field Schools of various non-treatment options at farms, markets and food-vendors levels and measured the effectiveness of different combinations of the measures in reducing health risks and quantify the risk reduction standard metric of disease units.
 - Assessed perceptions of key stakeholder groups in Ghanaian farmers, vegetable sellers, street food vendors and government institutions on non-treatment health protection measures and identified influencing factors for their adoption.
 - Conducted economic, financial, health impact, social-cultural and legal feasibility assessments on best combinations of non-treatment options and select most feasible combinations for sustainable public health protection in Ghana and Mexico.
 - Developed monitoring and institutional frameworks and assessed institutional capacity needs with gender balance to effectively implement and monitor non-treatment measures as well as treated wastewaters in Ghana, Mozambique, Cape Verde, and Angola.
 - Provided Unilateral Trust Fund project support in water quality, sanitation and environment in Morocco, Qatar, Kuwait, as well as issues of groundwater depletion and restoration.
 - Financed via FAO Technical Cooperation Programme a regional project involving Cyprus, Egypt and Jordan on wastewater treatment and reuse with main objective in improving efficiency of water use for crop production, through proper treatment of sewage effluent for irrigation. The Project main outputs included substantial training, technical assistance in participating countries, demonstration sites, and equipment for quality testing and monitoring.
 - Built pig farm wastewater treatment plant in Mexico with the objective to test innovative technologies by means of hydrophytes and promote reuse of the treated effluent for irrigation.



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- Supported the government of Chile through a one-year international project in evaluating the impact of microbial contamination in irrigation water with principal objectives: evaluate the existing levels of contamination; develop a database used as a basis to control contaminated water use in vegetable production; propose a certification system that could be used to promote safe production areas for both internal and international markets.
- Assisted policy formulation and demonstration of sustainable reuse of wastewater in Egypt and Jordan with the objectives in formulation of a national policy and strategy for comprehensive management of treated wastewater; establishment of a 5-ha wastewater reuse farm; and built national capacity in wastewater management.
- Assisted water resources in a land and water conservation project in Yemen, Morocco, and Saudi Arabia with enhancement of policy and institutional building in the field of wastewater treatment.
- Provided technical review of Namibian Integrated Bio-systems in wastewater treatment and recycling from feedlots and the ecological use of fodder from micro-irrigated schemes for industrial process.
- Developed Urban Producer's Resource Guide via case studies in Cairo, Accra, Nairobi, Antananarivo, Kinshasa, Dakar, Harare, Phnom Penh, Hyderabad, Caracas, and promoted Good Irrigation Practices for the reuse of wastewater for agriculture.



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