



INTERNATIONAL WORKSHOP on Wastewater Reuse Management



Editors :

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The Workshop is organized by the ICID Work Team on Use of Poor Quality Water for Irrigation as part of 52nd ICID International Executive Council Meeting to be held in Seoul, Korea in September 2001.

Background

World population growth is reaching the point where available freshwater is insufficient for the basic needs of mankind (eg for agricultural, industrial and urban use) This is becoming particularly acute in arid and semi-arid regions of the world. Hence, there is a growing need to utilise low quality water where freshwater is scarce. In this respect, urban wastewater, which is readily accessible, is a promising resource, but there are many concerns about the environmental and health impacts of using such waters. This particularly the case where wastewater effluent is used but proper monitoring is not carried out. There is a need for suitable guidelines for water users on the different aspects of using non-conventional water resources safely and economically.


The International Workshop on Wastewater Reuse Management, which was planned by the ICID Work Team on the Use of Poor Quality Water for Irrigation during the 50th IEC meeting in Granada in Sep 1999, in this proceedings are presenting different views and experiences as well as the state-of-the-art on the new technologies. The proceedings as such offer updated and detailed information to the scientific communities.

Objective

Wastewater reuse has been practised in many countries under different management guidelines. This workshop brings together experts from all over the world to discuss:

- suitability of the existing guidelines issued by the international organizations in the light of the new technologies
- experiences gained from different countries
- health related issues
- environmental impacts
- cost effectiveness
- planing and institutional aspects

It is hoped that the workshop will provide a suitable foundation for the Work Team to embark on the preparation of comprehensive guidelines for wastewater reuse.



Technology

- Innovation in treatment processes for wastewater reuse.
- Treatment process relative to quality of effluent for agricultural use.
- Innovation in sludge treatment for agricultural use.
- Appropriate irrigation systems for wastewater reuse.

Health related issues

- Disinfection of treated wastewater for agricultural use.
- Disinfection of treated wastewater relative to crop variety
- Sludge treatment for germ removal.
- Health issues related to the handling of wastewater
- Health hazards of using human wastes for agriculture

Environmental impacts

- Effects of treated wastewater on receiving ground and surface-waters.
- Wastewater reuse and soil environment issues.
- Environmental standards for wastewater reuse.
- Monitoring of wastewater reuse projects.
- Environmental impacts of using domestic sludge for agricultural use.

Cost effectiveness

- Economics of using treated wastewater for agriculture.
- The costs of treatment processes when using different crop varieties.
- Operation and maintenance costs of wastewater reuse projects.

Soil – crop – water management

- Irrigation management under wastewater reuse.
- The effects of using wastewater on quantity and of quantity of agricultural production.
- Wastewater sludge as a fertilizer for agricultural use.
- The effects of long-term wastewater reuse on physical-chemical properties of soil.
- Participation of local people in using domestic wastewater in irrigation.

Planing and institutional aspects

- Social impacts.
- Experiences of introducing wastewater reuse.
- Legal frameworks for regulation and compliance.





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Session 1: Technology

- 1. CHARACTERISTICS OF SLUDGE FROM DOMESTIC SEWAGE TREATMENT SYSTEM USING HUMUS SOIL AND RECYCLING OF THE SLUDGE ON FARMLAND**
Hideki Furihata, Haruo Kusu & Mutsuharu Imaoka
- 2. NEW TECHNOLOGY FOR PRODUCTIVE AND SUSTAINABLE REUSE OF WASTEWATER FOR IRRIGATED CROPPING: A CASE STUDY OF FILTER TECHNIQUE IN CHINA**
Cheng Xianjun, Gao Zhanyi & Nihal Jayawardane
- 3. CROP APPLICATION EFFECT OF FERTILIZER MADE OF SEWAGE SLUDGE AND FERTILIZER PRODUCTION SYSTEM**
Hiroaki Omura and Shinya Iwasaki
- 4. ARTIFICIAL WETLAND FOR WASTEWATER TREATMENT SYSTEM**
H. J. Park, D. S. Kim and T-S. Ahn
- 5. USE OF ZEOLITE TO CONTROL HEAVEY METALS IN MUNICIPAL WASTEWATER APPLIED FOR IRRIGATION**
S. H. Tabatabaei, A. Liaghat and M. Heidarpour
- 6. USING URBAN WASTEWATERS PURIFIED IN CONSTRUCTED WETLANDS FOR IRRIGATION AND AQUIFER RECHARGE**
A. Belligno, A. Hamdy & V. Sardo
- 7. INDIGENOUS TECHNOLOGY IN WASTEWATER RECYCLING: CALCUTTA CASE STUDY**
Santosh Ghosh

Session 2: Environmental Impacts

8. **BEST MANAGEMENT PRACTICES FOR REDUCING NITROGEN POLLUTION UNDER IRRIGATED SWEET PEPPER WITH TREATED WASTEWATER**
A. Mojtahid, M. Lamiri, R. Choukr-Allah, A. Hamdy, and H. El Omari
9. **ESTABLISHMENT OF PILOT AREAS FOR DRAINAGE WATER REUSE ON NEW RECLAIMED LANDS - A CASE STUDY FROM EGYPT**
A. A. Rady, A. A., Rashed, S.T. Abdel-Gawad, and F. M Ramadan
10. **WASTEWATER RECLAMATION AND REUSE POTENTIAL IN RURAL AREAS OF EGYPT**
A. El Sayed and S.T. Abdel Gawad
11. **MANAGEMENT OF WASTEWATER FOR IRRIGATION IN THE SOUTHERN PUNJAB, PAKISTAN**
Y. Matsuno, W. van der Hoek, J. Ensink, M. R. Aslam, and M. Sarfraz
12. **GROUNDWATER CONTAMINATION BY HEAVY METALS IN AGRICULTURAL WATER RESOURCES OF THE SHIRAZ AREA**
M. R. Farjood and S. Amin
13. **INVESTIGATION OF HEAVY METALS (Pb, Cd, Ni) CONCENTRATION IN THE DISCHARGE EFFLUENT OF FOUR TEXTILE PLANTS IN THE CITY OF YAZD**
H. R. Rahmani and M. Rezaei
14. **EXPERIENCE OF DRAINAGE WATER TREATMENT AND REUSE FOR IRRIGATION IN DIFFERENT NATURAL CONDITIONS AND CROPS**
R. Razakov, B. Rahmonov, R. Rahmatov and R. Aliev

Session 3: Soil-Crop-Water Management

15. OPTIMIZATION OF NITROGEN USE FOR THE PRODUCTION OF CHRYSANTHEMUM CROP IRRIGATED WITH TREATED WASTEWATER
B. Benhoummane, R. Choukr-Allah, A. Hamdy and H. El Omari
16. FEASIBILITY STUDY OF RECLAIMED WASTEWATER IRRIGATION TO PADDY RICE CULTURE IN KOREA
Chun G. Yoon and Soon K. Kwun
17. EFFECT OF TREATED WASTEWATER ON ACCUMULATION OF HEAVY METALS IN PLANTS AND SOIL
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Session 4: Planning and Institutional aspects

22. **EVALUATION OF ALTERNATIVE USE STRATEGIES OF TREATED WASTEWATER IN AGRICULTURE**
H. Fahmy, M. Tawfik and A. Hamdy
23. **REUSE OF TREATED WASTEWATER AND SLUDGE FOR AGRICULTURE IN INDIA – CASE STUDY**
S. N. Patankar
24. **PROPER MANAGEMENT MEASURES (AS WELL AS LAWS AND BY-LAWS) NEEDED FOR EFFLUENT-TREATED WASTEWATER REUSE IN PALESTINE**
M. Y. Sbeih
25. **PERI- URBAN AGRICULTURE: THE OPTION OF WASTEWATER REUSE**
Lydia Twikirize