



The implications of (re-)use of waste-water for irrigation in Bangladesh

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One major problem in low-income countries is that the treatment of wastewater is not a priority. The practice of re-using untreated wastewater for irrigation might, in the longer term, also be an important incentive towards treatment. Another issue is that the standards for water treatment in high-income countries have often the ecological objective of avoiding eutrophication and are often unrealistic and prohibitively expensive as targets in poorer countries. Moreover, the fertilizer content of waste water is potentially a substantial saving on the use of chemical fertilizers.

In Bangladesh it is estimated that there is an annual production of 725Mm³ of wastewater from the urban areas of Bangladesh. So, it is plausible and convincing that the use of this water for irrigation can be integrated in a holistic approach for the management of water quantity and quality. Well-planned utilization of wastewater in agriculture will increase food production by more irrigation coverage and improve the livelihood of farmers at the proximity of wastewater sources.

During three years' of intensive and controlled field experiments on several crops with municipal wastewater of Mymensingh town, some interesting and promising results have been obtained. The fertilizer value of waste water was established. The impact on the soil characteristics was studied. Also the waste-water irrigation practice in twelve peri-urban areas was investigated by farmers questionnaires. From this research it was clear that although aware of the negative effects the farmers appreciated the fertilizer contribution to their crops.

From our field experiments it is clear that 20 to 30% savings can be made on fertilizer use, especially for a nitrogen and phosphorus. This fertilizer contribution by waste water is only partially covering the needs and therefore this should be subtracted from the recommended dose. Although vigilance concerning the sources of waste water is important but in our case at Mymensingh we did not find any heavy metal or other worrying pollution in the waste-water. An important aspect are the hygienic conditions, which are often monitored by counting coliform bacteria and helminth eggs. These are indicators for the risk of pathogens. A number of measures in field and crop management can be advocated in order to reduce the exposure in human consumption to diseases.

No major adverse effects were found to the soil at some depth below the soil surface and therefore the risk to groundwater pollution can be considered to be acceptable. Experiments on columns in laboratory have also shown that the components in the waste water reduce the mobility of heavy metals. In a wider catchment context the (re-)use of waste-water for irrigation can also be seen as a way of treating the water. Our research in general shows the importance of a holistic integrated approach to waste-water in poorer countries in which the origin/source, the use/treatment and the downstream discharge of waste-water into the environment are considered simultaneously and not as isolated stepwise objectives.