ABSTRACT

To develop a framework for a national Palestinian strategy for management of rural wastewater it is expected that at least quantity and quality of wastewater is known. For the West Bank there are no annual statistics on the total volume of rural wastewater generated, transported, treated and reused. This study assesses the potential of wastewater reuse as a non-conventional resource in the Palestinian rural areas. The potential of reuse refers to the amount of rural wastewater that is or could be collected and treated and that would possibly add to the national water balance and also the effluent quality needed for each reuse option.

The methodology included developing a framework for assessing wastewater quantities generated from rural areas using three water sources for consumption within households: water network, water vendors and cisterns. Questionnaire form was distributed to the NGOs via e-mail to gather information about implemented wastewater treatment units. Amounts of wastewater generated, treated and reused were calculated for year 2007. Flow generations were projected to different periods till year 2030. Projects quality results for onsite treatment units and collective systems were gathered from several NGO`s and were compared with the Palestinian Standards of treated wastewater 742-2003. Wastewater reuse options were studied using the scenarios of collection suitable for rural areas and water savings under selected reuse options were estimated and discussed. Then, a framework for a national Palestinian strategy for management of rural wastewater was proposed.

It is found that 80% of consumed water quantities in Palestinian rural areas are supplied by water networks, 10% from cisterns, and 10% from water vendors. The 383 implemented onsite treatment units treat 7% of the collected wastewater. The 10 implemented collective systems treat 0.3 % of the wastewater amount. The total wastewater generation rate for 2007 in Palestinian rural areas is 8,975,513.3 cubic meter and is estimated to increase to 13,928,964.5 cubic meter by year 2030. The results for projects` quality analysis compared to Palestinian standards show that: For onsite treatment units fruiting trees could be irrigated with the effluent from treatment plants generating effluent with COD, BOD and TSS values less than 150, 60 and 90 mg/l respectively but with 3 barriers. Unfortunately, the treated effluent from the collective systems is not suitable for even unrestricted irrigation.

The study concludes that given the blooming water resource crisis, wastewater must be recognized as part of the total water cycle. If all of the wastewater generated were to be reused, it would be possible to save 14% of the supply and demand gap. Onsite systems at household level with the effluent used for irrigating fruits and flowers are the proposed systems to be applied in most of the rural Palestinian areas and must be maintained and monitored to control pollution and to recover water for non-potable water uses.