

## **ISRAEL: A CASE STUDY ON COMMITMENTS-RELATED BEST PRACTICE OR LESSONS LEARNED IN SANITATION**

Located in the arid region of the Middle East where there is severe water shortage combined with contamination of water resources, densely populated urban areas and highly intensive irrigated agriculture, Israel must put wastewater treatment and reuse high on its list of national priorities. Effluents are the most readily available and cheapest source of additional water and provide a partial solution to the water scarcity problem. From 1992 to 2003, the quantity of treated wastewater grew from 126 million to 332 million cubic meters per year.

Today, the rate of effluent reuse in Israel is among the highest in the world, however, it does not encompass the total quantity of wastewater produced (450 million cubic meters per year). National policy calls for the gradual replacement of freshwater allocations to agriculture by reclaimed effluents. Presently 3% (300 million cubic meters per year) of treated municipal sewage is reused for irrigation, which is about 30% of the total water supplied to agriculture (about 1000 million cubic meters per year). It is estimated that by 2020 effluent use will constitute 50%.

The Ministry of the Environment recently finalized recommendations for effluent quality standards for different purposes that are more stringent to previous regulations, promulgated in 1992. The recommended values, designed to minimize potential damage to water sources, flora and soil, call for much higher treatment levels in existing and future wastewater treatment plants. An agreement in principle has been reached on the new effluent quality standards, and a techno-economic review of the standard has been conducted. The objective is to treat most of the country's wastewater to a level enabling unrestricted irrigation in accordance with soil sensitivity and without risk to soil and water sources.

Israel is focusing special attention on addressing unique environmental problems that relate to the salination of municipal sewage, which is a major problem due to the country's need to use reclaimed effluents for irrigation purposes. It is estimated that industry contributes some 50% of the total chloride addition to municipal sewage, of which roughly 30% is derived from industrial water softening processes. There are no inexpensive ways to remove the salts once they enter sewage, and the prevention of sewage salt enrichment is one of the most immediately available solutions.

To reduce the salinity level of municipal sewage, a series of regulations have been promulgated over the past decade. Those promulgated in 1998 prohibit the discharge of brines (exceeding 10 tons of salt per year) to water sources and municipal sewerage systems from ion-exchange renewal, food, tanning and textile industries, and hospitals and a scheme to discharge clean brines to the sea has been implemented. Discharge of brines to the sea requires a permit from the inter-ministerial permits committee on discharge of wastes to sea according to the Prevention of Sea Pollution by Land Based Sources Law and its

accompanying regulations (that comply with the Land-Based Protocol of the Barcelona Convention). Sea discharge is permitted if it has been established that a land alternative for disposal does not exist and that marine pollution will not be caused.

A unique regulation was approved in 1999 regarding the Boron, Sodium and Chloride content of detergents, based on the existence of appropriate technology to produce this type of detergent. In September 2004, Business Licensing Regulations (Salt Concentrations in Industrial Sewage) will come into force, which set threshold values for chloride, sodium and boron concentrations in industrial sewage.

Additional regulations have recently been promulgated: Prevention of Water Pollution pH Values of Industrial Sewage (set pH values for municipal sewage in order to prevent the pollution of water sources from the impacts of corrosion generated by industrial sewage) and Usage of Sludge (require wastewater treatment plants to stabilize and treat the sludge they generate to enable agricultural use or soil conditioning). Surveys show steady reductions in both chloride and sodium concentrations since the regulatory and enforcement activities began in 1994. The decrease is largely attributed to adoption of reverse osmosis technologies by a large number of industrial plants.

Legislation was recently completed regarding an ecosystem approach to river management. Initially, it applies to two river basins while the objective is to eventually include all of the eleven drainage authorities. The two drainage authorities selected were assigned functions of a river authority, regarding every stream or water source in its area. The work plan of the authority is to be carried out in a sustainable manner, taking into account the functioning of those ecosystems within the area of the plan, the quality of water resources and the protection of biodiversity. (In a “sustainable manner” means use of natural resources in a manner that allows natural processes to renew what was used.) Overcoming the severe water shortage by increasing water potential is high on the national agenda and demands working in several directions. Desalination of sea and brackish water is one of the essential solutions. Israel’s national water supply company has built and operated small and medium-size desalination facilities in the southern part of the country since the 1960s.

A government decision to desalinate on a larger scale was taken in 2000. All tenders issued for desalination facilities stipulate stringent threshold levels for water quality and provide incentives for even higher water qualities, especially in terms of chloride levels, in order to allow for irrigation without the attendant problem of soil salinity.

Plans and tenders are being advanced for desalinating saline water and connecting these facilities to the national water system. The potential of brackish water desalination has been estimated at about 200 MCM based on brackish water sources throughout the country including certain saline springs.

Desalination of this water will serve local needs while helping to solve the problem of growing salination of natural sources of water through the utilization of this water.

The management of water and sanitation is part of the same process. If sanitation is regarded as creating a source of water, there would be a higher commitment to ensuring that effluents are treated, which would be not only beneficial to health and welfare but also conserve ecosystems. Israel’s experience shows that effective and efficient re-use of treated wastewater for agriculture requires a combined management system which not only relates to the allocation of

freshwater and the treatment of wastewater but to the pro-active management of the sources of wastewater, in order to ensure that the resulting treated effluent is appropriate for its intended re-use.

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