

THE MOROCCAN EXPERIENCE IN THE TREATMENT OF WASTEWATER

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Morocco , like most of the developing countries located in the arid and semi arid areas , is facing a shortage in water availability. The situation may become of concern in the next few decades due to the sustained rate of the population growth and to the regular and repetitive cycles of drought. No conventional resources exploitation for irrigation is one of the solution envisaged to reduce the effect of this shortage by releasing freshwater for meeting the urgent populations needs. Reclaimed wastewater is the most interesting among these non conventional resources because of its volume and its perennality.

Recent estimations of wastewater in Morocco showed a production of 370 millions m³ per year (Benchokroun and Bouchana, 1991) and are expected to reach 900 millions m³ by the year 2020.

In most cases the wastewater discharges directly to the environment, either to the sea via short outfalls or onto farmland for irrigation or infiltration.

Irrigation with raw wastewater is forbidden in many areas, but the authorities often turn a blind eye because it is recognized that the practice plays an essential role in the lives of poor subsistence farmers who would otherwise have no access to water.

It is thought that around 7235 hectares of land are irrigated with raw wastewater in Morocco (table 1). The crops grown are mostly cereals, vegetables and salad crops, fodder pasture and trees.

Table 1 : A main zones of raw wastewater reuse in Morocco
(C.S.E.,1994)

cities	irrigated areas	crops grown
Marrakech	2000	cereals, vegetables, trees
Meknes	1400	vegetables,fodder pasture,trees
Oujda	1175	vegetables, cereals, trees
Fes	800	trees, vegetables
El Jadida (coastal)	800	vegetables, fodder pasture
Khouribga	360	cereals, vegetables
Agadir (coastal)	310	trees,vegetables,soya-bean, flowers
Beni Mellal	225	cereals,vegetables, cotton, beetroot
Benguerir	95	vegetables, fodder pasture, trees
Tétouan(coastal)	70	vegetables, fodder pasture
Total	7235	

There is a high incidence of excreta-related disease in Morocco due to irrigation with untreated sewage. There are clearly potential health risks, particularly from cholera, typhoid, schistosomiasis and intestinal nematode infections. Although 75% of the urban population is connected to sewerage systems, only around 15% of towns have any treatment facilities.

The first wastewater treatment systems constructed in Morocco about the years sixty are : sedimentation tanks, settlement and digesters, activated sludge and fixed film-reactors. The main objective is to reduce the organic load in order to protect the aquatic environment. Many problems have been encountered by the municipalities to exploit this systems.

From the years 80, a performant and extensive systems are constructed (stabilization ponds, infiltration-percolation) in order to improve the purified water quality and to insure the public health protection.

Among the 63 existing stations repertoried in Morocco only 24 are still functional :

*15 are managed by private or para-public enterprises for small communities of 1500 to 3000 PE.

*10 are managed by the local collectivities : 2 activated sludge systems, 2 digesters and 6 extensive systems.

The purifying yields are evolving gradually from medium to excellent ones. The functioning activated sludge systems are efficient to reduce organic load. The extensive systems are more performant in the removal of pathogenic germs.

The major problems encountered with the existing systems are at present :

- * inadaptation of the treatment system to the local means and requirements
- * failing of disposal conception
- * absence of maintenance
- * non appearance of special budget for sewerage
- * lack of engineer and technician formation
- * absence of short and long term planification
- * lack of sewage legislation

References

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