

UTILIZATION OF TREATED SEWAGE AS A LOCAL WATER RESOURCE

Presented by

Prof. Em. Dr. Laszlo Vermes

Corvinus University of Budapest

- **Introduction**

Every study and assessment dealing with water problems of the European Union agree in the high importance of water management and *increasing value of local water resources* in the future.

Decreasing availability, declining quality and growing demand for fresh water are creating significant challenges. Our water resources are still under *increasing pressure* from pollution, from over-exploitation and from climate change, and – even in the light of significant uncertainties about future hydrological regime in Europe –

- ... cleaning up our waters, strengthening biodiversity, moving towards improved water efficiency and maximising water availability must all be part of the answer to all these challenges.
- **Sewage utilization can be a solution**
Using the natural water resources for supplying different kind of water demands in an area may lead to increased exploitation of existing amount of water in some periods of time. This phenomenon and its consequences can be found also in middle Hungary, in the area between the Danube and the Tisza rivers.

- Especially in drought prone areas the water shortage in the summer, in the growing season of most cultivated plants as well as in the life of species in the nature protected fields can cause considerable damages.
- At the same time great part of the water utilized in towns and settlements by the public and collected as sewage is conducted after some treatment into the recipients, therefore this amount is getting lost from the view-points of other local water supply, and because of that additional water resources should be found or drawn on for satisfying the needs.
- Nevertheless the treated sewage could be used for some purposes, e.g. for irrigation, taking as a *local resource of water* instead of discharging it away from the area.

- There are several good examples all over the world, and especially in Europe, where treated sewage was used in agriculture and/or in nature protection. Best known projects are the *waste water irrigation in Braunschweig, Germany*, and the *disposal on forests in Wroclaw, Poland*.
- In most of these cases the locally exploited water – after used for drinking and household purposes – was collected as polluted water and – having been treated – was used in the same area for supplying and fulfilling other local water demands.
- This practice can help in considerable *saving natural fresh water resources* on one hand, and also help effectively *in the fight against water shortage and drought* in the same area on the other.

- **Examples from Hungary**

Based on the results of intensive foreign and home research works as well as on good practical experiences gained in the last century, *two main technologies were developed* for a multipurpose use of treated urban effluent as follows:

- One is the waste water disposal and utilization in tree-plantation (in most cases poplar plantation), including special plantations for bioenergy
- Second is the so-called combined waste water utilization and disposal technology where the sewage is distributed partly on *arable land*, partly on a *tree-plantation* (or on other type of disposal field)

- Both technologies are operating all year round and are able to substitute technical solutions of biological and even tertiary treatment of urban sewages.
- In Hungary both methods have been implemented and used effectively between 1970 and 1990. The *first technology* has been established *in the town Gyula*, situated in South Hungary, where a *140 ha size poplar plantation* was irrigated by furrows with the mechanically pretreated sewage, with an average loading of 1180-1600 mm/year. The sewage was cleaned up in the soil completely, and the trees were producing an extremely good timber production during a much shorter period of time comparing to non-irrigated plantations, providing parallel advantages.

- Our second example was the *Kecskemét Sewage Utilization and Disposal System*, situated in Middle Hungary, where a combination of *730 ha arable land* with sprinkler irrigation (200-300 mm/y) and a *76 ha poplar plantation* with furrow-irrigation (1500-2000 mm/y) was established in 1975 and operated through 15 years. The system provided a continuous disposal and full treatment for the urban sewage, and at the same time made possible the growth of intensive and valuable crops in this drought prone area. Without sewage utilization no other source of water would be available for irrigation in the region.
- The *role and importance* of these land application methods should be seriously taken into consideration in the working out process of the *river basin management plans* according to the Water Frame Directive of the European Union.

- It is necessary and advised to investigate the possibilities and find out the places for the establishment of these kind of *sewage utilization systems* that can help in the reservation of water in a certain area, in a better and multiple use of the water in a catchment or a sub-catchment, and in making a better balanced water management in water scarced regions by the multiple use of water in some of these sewage utilization systems.
- *Thanks for your kind attention!*