

SUSTAINABLE SANITATION – A PROBLEM OF THE THIRDS MILLENNIUM

A.D. ANCAS¹

M. PROFIRE¹

Abstract: *The EU strategy of sustainable development is based on the protection of the environment from the pollution and health protection point of view as well as resource management. The main functions of the sanitation system are: preventing the degradation of the environment, recycling and, last but not least, health protection. In the hereby article, starting from the definition of sustainable sanitation as it was globally adopted, after a brief presentation of the European law regarding sustainable sanitation, one offers an overall vision of the sanitation matter as a foundation of health, dignity and human development, being a challenge of the third millennium.*

Key words: *sanitation, environment, health protection.*

1. Introduction

The sustainable sanitation is defined as a complex system that protects and promotes human health, doesn't contribute to environment degradation or the exhaustion of the resource base and, from the ethnic and institutional point of view, is economically viable and socially acceptable [1], [3], [6].

In the more developed European countries these complex systems have already implemented based on rigorous studies that lead to adopting adequate solutions from the social, economical and environmental point of view, considering the main functions of sanitation and waste waters treatment: *public health protection, nutrients recycling and protection of the environment.*

In the past ten years in countries like Sweden, Germany, Norway the sustainable sanitation systems had been already

introduced thus replacing the natural treatment systems of the waste waters, systems that currently are used less and less.

2. EU Law Regarding Sustainable Sanitation

The principle of sustainable development is highlighted at European level in the Treaty of Rome and included in the development phase of the program of environment measures and in the EU strategy of sustainable development.

The EU legislation regarding sustainable sanitation is based on the reduction of pollution, of sanitary risks and promotes the re-use of natural resources, the specific directives being as follows:

-Directive 2000/60/E – Water Frame Directive;

-Directive 91/271/EEC – Directive of Urban Waste waters;

¹ Technical University "Gheorghe Asachi" of Iasi, Faculty of Civil Engineering and Building Services, Department of Building Services.

-Directive 86/278/EEC – Directive of Agricultural Waste Waters

-Directive 1999/31/EC – Directive of Waste Storage, etc.

Frame Directive for Water aims to keep and ` of water quality as an effect of pollution and eutrophication.

Directive of Urban Waste waters imposes on all member states the ensuring of an efficient cleaning of waste (used) waters, targeting urban settlements of over 2000 inhabitants.

Directive of Agricultural Waste Waters provisions the use of sludge in a harmless manner for the soil features and bans its use for different types of cultures.

These are just a few of the most important EU legislation directives in the field, mentioning the fact that the law regarding the use of natural unconventional resources in the field of sludge management or of other sewage waste is still contradictory and difficult to interpret.

3. Sanitation System

When one talks of a sanitation system and is planning it, the limits of such system must be established.

In planning and designing, by analysing the solutions adopted one sees that it is more comfortable and useful to think about the sanitation system like a *technical system* including all components, starting from sources (all sink drainage, toilets, etc) until their flowing in the receiving system.

Between sanitation and drinkable water there is a very tight connection:

-The sources used for the drinkable water can be polluted by the insufficiently treated waste water;

-The sanitation system mustn't use a water quantity larger than the necessary one, considering the fact that for a good public health water must be available in sufficient quantities;

-Recycling waste water through good cleaning (one considers recycling for agricultural purposes) leads to diminishing the strain on the water sources.

Considering that all that *enters the system finds itself in what comes out of the system*, we think that one must begin by regulating the measures regarding *the control of the source*.

In conclusion, the main functions of a sustainable sanitation system are: *health protection, nutrients recycling and protection against environment degradation*, a sustainable sanitation must integrate all these functions.

4. Sanitation – the Challenge of the Third Millennium

Health protection, one of the primary functions of the sanitation system presumes analysis of current situation of the drinkable water.

One of the eight Development Objectives of the Millennium, mentioned as early as the year 2000 in the U.N Millennium Declaration, durability of the environment must be ensured by cutting in half the number of people that haven't got access to drinkable water, the due term being year 2015.

The World Health Organization established a quantity of about 20 litres of water/human.day as being the minimum necessary quantity of water in order to maintain the health, studies showing that actually the necessary quantity is of 100 litres of water/human.day [2], [3].

But how must we act in case there *is less and less water to fulfil all needs*? A possible answer would be a recycling process corroborated with an appropriate cleaning procedure.

In ideal conditions the sustainable sanitation systems allow the complete recovery of all nutrients, a minimisation of water polluting while simultaneously

ensuring an economic use of water and its re-use at full capacity.

The use of artificial fertilizers in agriculture has reduced farmers’ interest towards nutrients recycling which by not being appropriately treated become an issue for the environment. Also, it is known that waste waters, not cleaned or inefficiently treated lead to eutrophication, growth of salt levels in the ground etc. – unacceptable in the context of sustainable sanitation.

The European Directive 271/91/EEC regarding the treatment of waste urban waters obligates the member states to provision and bring to operational conditions the biological step in the waste water treatment plants for all gatherings of over 2000 inhabitants. Fairly recent studies [2], [5], [4], show that the population living in settlements of less than 2000 inhabitants represent an important percent of the population of the central and east European countries, their impact on the

quality of the water being a major one, therefore rural systems of water, sewers and sanitation must urgently be developed.

5. Various Technologies for Sanitation and Treatment of Waste Waters

When one opts for a certain sanitation system one stresses the function of the system. The technology used differs from one case to another, the Table below showing a general view of these technologies [2].

So, technologies of classical and natural cleaning as well as separation at source are appropriate for small range sanitation systems, being efficient only if designed appropriately, the execution and exploitation costs being reduced.

6. Conclusions

A safe and comfortable sanitation system is a basic human necessity, being one of

Type of technologies

Table 1

	Tratament technology		Separation at source
	classic	natural	
Pre-cleaning – removal of solid matters in suspension	Filters Grids Strainers Pre-decanting pools	Decanting ponds Septic tanks	Grids Strainers
Removal of nitrogen	Nitrification, De-nitrification in cleaning stations Ammonia stripping	Nitrification, De-nitrification in humid areas or sand filters	Dry separation of urine Black water separation
Sludge management (water separation, stabilisation, hygienisation)	Site Centrifuge Fermenting	Drainage beds Long term storage Composting Lime stabilisation Hygienisation-nitrogen	Strainers Centrifuge

our society's challenges to ensure that all human *have functional sanitation* and also, to develop various efficient systems of managing wastes and water pollution by safe and sustainable technologies.

In conclusion, when choosing the sanitation system the purpose is the *function of the system* and *technology is a means to the goal*.

Nationally, the development of a strategy in the field of sanitation in terms of sustainable development is primordial. The legislation must be aligned to the EU legislation by drawing-up guides and procedures regarding planning and financing of the sanitation system based on which one could draw-up studies based on real data from the field in order to design an appropriate sanitation system.

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