

THE EFFICIENCY AND SOLUTIONS FOR WATER QUALITY IMPROVEMENT IN CONSTRUCTED WETLANDS IN LATVIA

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Abstract

Human economic activities contribute to the entry of phosphorus and nitrogen into natural waters from different anthropogenic pollution sources, such as economic and agricultural activity, construction areas, and industry. Eroded soil particles in a form of suspended solids from agricultural areas, roads and areas with impermeable pavement, direct wastewater discharges and similar consequences of economic activity reduce the quality of natural waters. Entry of phosphorus, nitrogen compounds and suspended solids into natural water bodies leads to overgrowth of aquatic plants, also known as eutrophication. As a result of eutrophication, the algae and other aquatic plants may proliferate in the reservoir, transparency and the amount of oxygen may decrease, thus reducing water quality and usability.

Since 2013, additional attention has been paid to water quality from agriculture industry in Latvia. The EU Nitrates Directive identifies areas that are vulnerable to nitrate pollution in water and the need for measures to limit nitrate losses and adverse effects in open water bodies. In order to fulfil the requirements for good water quality in the surface waters, nitrate leaching from agricultural areas must be prevented. The method of low energy consumption and maintenance costs intends to use natural conditions and passive wastewater treatment in the constructed wetlands. Since June 2014, two wetlands were created and monitored in Latvia to improve water quality from the areas affected by agricultural activities. Research sites of the field scale have helped to gain experience in using the elements of environmentally friendly drainage systems, taking into account the specific agricultural approach, and to monitor the effectiveness of the recommended elements in nutrient retention.

Keywords: Constructed wetlands, wastewater