

Group 4 Project

Purification of waste waters in Bosnia and Herzegovina

Introduction

Wastewater is any water that has been contaminated by human use. It is a byproduct of domestic, industrial, commercial or agricultural activities.

These include waters from households (toilet flushes, dishwasher), swimming pools, runoff, water from industry and car garages...

Water is an essential body nutrient and therefore humans need to preserve it as only 2,5% out of 71% is a potable water. Moreover, 98,8% of drinking water is trapped inside ice caps and glaciers so it makes it even more frightening to hear that not enough attention is paid to preserving the available water and seeking after sustainable solutions.

Introduction

Some examples (industrial waste-water)





Main causes:

Humans are the main cause of water pollution, which is triggered in many ways: by the dumping of industrial waste; due to temperature rise, that cause the alteration of water by reducing the oxygen in its composition; Or due to deforestation, which causes sediments and bacteria to appear under the soil and therefore contaminate groundwater.

In the same way, the pesticides used in agricultural fields filter through underground channels and reach the consumption networks; And also as a result of accidental spillage of oil.

Main causes:

Types of water pollution are:

1. Chemical pollution
2. Groundwater pollution
3. Microbiological pollution
4. Nutrient pollution
5. Oxygen depletion pollution
6. Surface water pollution





Consequences:

Water pollution has a great impact on the environment. Water pollution can result in human health problems, poisoned wildlife, and long-term ecosystem damage.

The disappearance of biodiversity and aquatic ecosystems:
Humans are harmed by the alteration in the food chain and by contracting illnesses when drinking or using contaminated water.

Furthermore, when agricultural and industrial runoff floods waterways with excess nutrients such as nitrogen and phosphorus, these nutrients often fuel algae blooms that then create dead zones, or low-oxygen areas where fish and other aquatic life can no longer thrive.



Consequences:

Algae blooms can create health and economic effects for humans, causing rashes and other ailments, while eroding tourism revenue for popular lake destinations thanks to their unpleasant looks and odors. High levels of nitrates in water from nutrient pollution can also be particularly harmful to infants, interfering with their ability to deliver oxygen to tissues and potentially causing "blue baby syndrome." The United Nations Food and Agriculture Organization estimates that 38 percent of the European Union's water bodies are under pressure from agricultural pollution.

Consequences:

Globally, unsanitary water supplies also exact a health toll in the form of disease. At least 2 billion people drink water from sources contaminated by feces, according to the World Health Organization, and that water may transmit dangerous diseases such as cholera and typhoid.



Solutions: Biological filters

Plant devices are complex biological systems that are designed and built in a way that can be used natural processes occurring in wetland plants and soil, including the microorganisms involved in water purification. They are designed to mimic the processes that occur in nature wetlands, but under controlled conditions.

Easy operation, high purification efficiency and relatively low costs of plant construction and maintenance, compared to conventional technologies purification, characterize plant devices as quality and acceptable purification solutions.

They are used primarily for cleaning domestic (sanitary) wastewater from smaller settlements away from urban areas.

Solutions: Biological filters

The most important function of plants in wastewater treatment is physical performance. Plants with their roots stabilize the surface of the plant device, provide good conditions for physical filtration, protect from freezing during the winter, they allow the creation of a large area for the growth of microorganisms.

The main role in the purification process is played by the microorganisms that are inhabited on plants in which the leaves, trees and roots are filled with air cavities by means of which the air leads from the atmosphere to the roots and into the surrounding soil.

Solutions: Biological filters

Microorganisms are the main factors in wastewater treatment because they use organic matter as a nutrient and a source of energy, while transforming it into biomass and energy. Most of these microorganisms are found on the surface of the root or substrate.

Two types of systems:

- plant devices with free water face
- plant devices with subsurface flow



Solutions: Biological filters

Some examples in Bosnia and Herzegovina



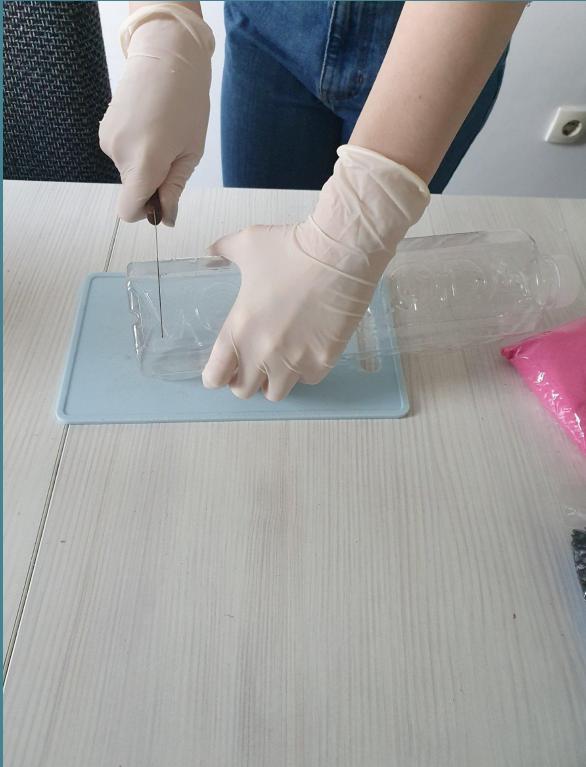
Our experiment

A home-made filtration system: The location and equipment



Our experiment

The process: Preparing the bottle, the cloth and adding charcoal



Our experiment

The process: Adding sand, activated carbon and gravel



Our experiment

The final result!





Thank you for your attention!