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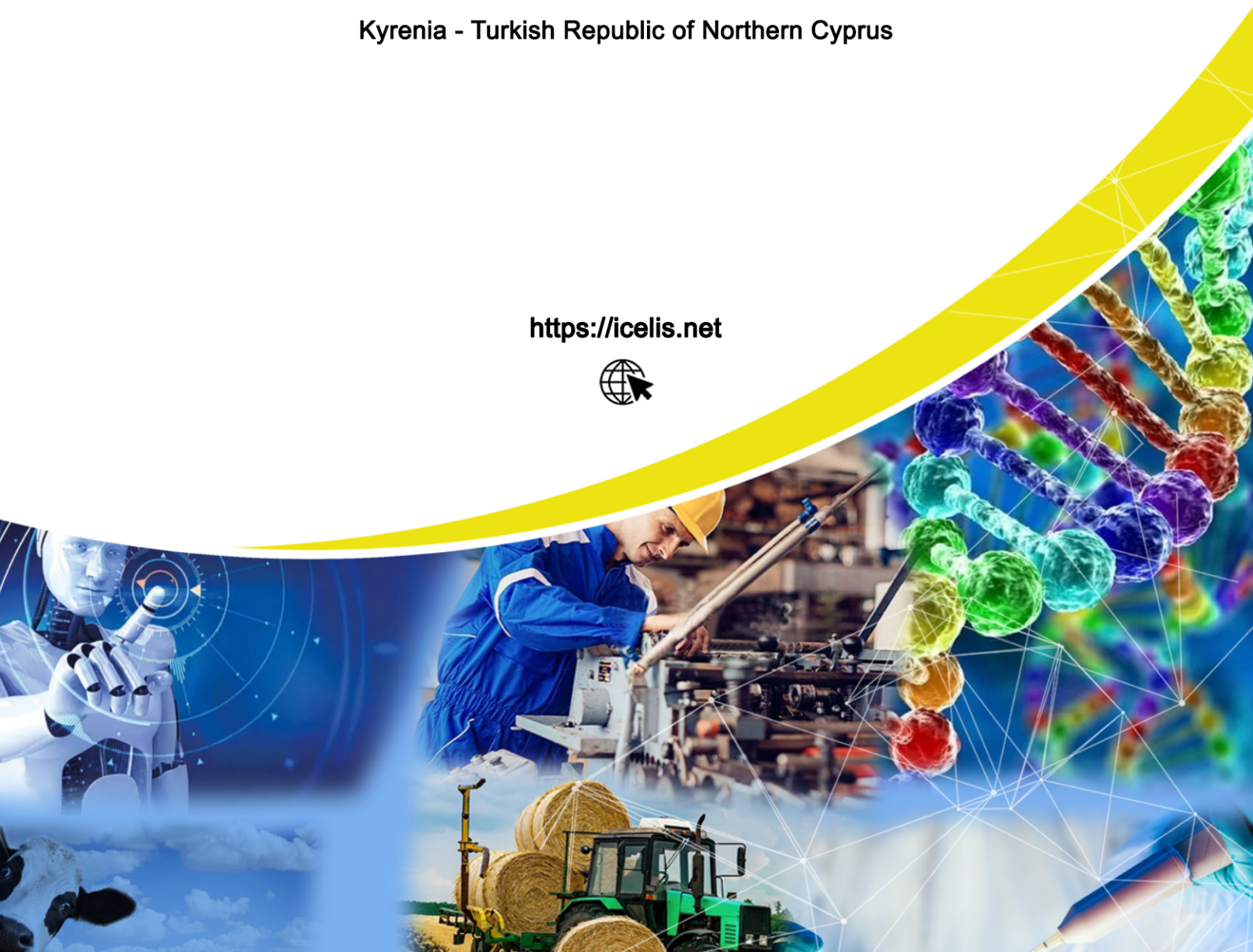
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POSTER PRESENTATION

Assessment of Key Nutrients in Trabzon Wastewater Treatment Plant

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Abstract

Wastewater treatment facilities are crucial for maintaining environmental health, as untreated or inadequately treated effluents can accelerate eutrophication and disrupt ecosystem equilibrium. Most municipal facilities in the Black Sea region, including the Trabzon Municipal Wastewater Treatment Plant, exclusively employ mechanical treatment and do not utilize biological processes. This complicates their ability to eliminate nutrients. Seasonal analyses revealed stable phosphate values (36.56 ± 0.18 µM in winter; 38.11 ± 0.20 µM in autumn), alongside a notable rise in nitrate levels (from 4.99 ± 4.94 µM to 8.40 ± 4.04 µM). The fast increase in ammonium concentrations (59.99 ± 0.83 µM to 99.96 ± 1.58 µM) was concerning as it indicated inadequate nitrogen removal efficacy. Silicate concentrations consistently remained high (357.98 ± 0.73 µM in winter; 340.94 ± 1.91 µM in fall), likely fostering diatom prevalence and modifying phytoplankton community composition. The data indicate that whereas phosphorus supplies appear steady, the concurrent increase in nitrate and ammonium suggests an accumulating nitrogen load, elevating the risk of eutrophication. Elevated silicate concentrations significantly increase the likelihood of an imbalance in the Black Sea's delicate ecosystem. The findings indicate that the current mechanical therapy is insufficient. If biological treatment and improved nutrient removal are not implemented, water quality is likely to deteriorate due to nutrient accumulation. To ensure the long-term viability of coastal ecosystems in the region, continuous monitoring and assessment are essential.

Keywords: Wastewater, Nutrients, Sewage Discharge.