

IMPACT OF NITROGEN, PHOSPHORUS AND HEAVY METALS IN DOMESTIC WASTEWATER ON COASTAL ENVIRONMENT

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Domestic wastewater has been discharged to coastal area resulted in a whole array of direct and indirect effects on coastal vegetation, species diversity of fauna, sediments and oxygen levels. Nutrient rich coastal water governed partly by a complex balance of input nutrients from domestic wastewater, decomposition and mineralization of dead planktonic algae, and other organic matter. The coastal environment is therefore characterized by higher primary production, heavier sedimentation of dead organic material and greater consumption of oxygen arising from decomposition of the dead organic materials. A deficiency of oxygen can probably be regarded as a consequence of eutrophication.

Wastewater purification is in need to reduce its nutrient and organic content lead to beneficial effects on receiving coastal water. In the mean time, domestic sewage sludge as a by product of water treatment processes is organic material included eutrophication substances also in need to be managed appropriately. The sludge possesses advantageous property such as nitrogen, phosphorus and heavy metals as essential elements (Cu, Mn, Fe and Zn) can be utilized as soil amendment on one hand, while having disadvantageous property such as heavy metals as toxic element (Cd, Ni and Pb) on the other. The result from pot and field experiments indicated that agricultural value of the sludge was equal to or higher than that of chemical fertilizer. Heavy metals (Cu, Mn, Fe, Zn Cd, Ni and Pb) in the sludge up to 80 tons DM/ha did not showed the negative effect on yield significantly. Besides, phytotoxicity of the test plant did not appear. The risk of heavy metals contamination in the sludge, the agricultural soil and the test plant can be accepted within safety level.

In conclusion, nitrogen, phosphorus and heavy metals as eutrophication substances in domestic wastewater has been had highly negative impact on coastal environment, due to toxic effect or cause acute damage to fish and other marine organisms, can be valuable on land regarded as a renewable resource in agriculture. Therefore, Integrated approach to water resource management based on a balance between uses of water resources to satisfy the basic needs of people as well as to utilize waste from wastewater purification is one of profitable option to extricate the negative impact of domestic wastewater on coastal environment.