Field survey of a sustainable sanitation system in Miyako island in Japan

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Sustainable Sanitation System that was developed by this research is a new wastewater treatment system that incorporates a home using non-flushing toilet (Bio-toilet) that converts excreta into a reusable resource that it supplies as fertilizer or humus for organic agriculture(Fig.1). In addition, the elimination of black water from the residential wastewater stream by using Bio-toilet reduce the mass of pollution load from a household and contribute toward conserving the environments of rivers, inner waters, and reservoirs.

In this paper, we introduce one of the pilot project called "Organic System" in Miyako island in Japan. The Organic System consists of Bio-toilet and constructed wetland. The Bio-toilet uses sawdust as an artificial soil matrix to decompose excreta into compost, and even to form gas and humus. The constructed wetland for wastewater process uses aggregate filter.

The paper also describes the good results obtained concerning the state of operation of the Bio-toilet and the constructed wetland. The water quality of influent and effluent of the constructed wetland was investigated. The COD, T-N, T-P, nitrate nitrogen, and ammonium nitrogen influent and effluent were measured during Oct. – Nov. ,2004. As a result, the COD and T-P of the effluent of the constructed wetland were around 30 mg/l and 0.3 ppm respectively due to the low loading.

This paper introduced a new wastewater treatment system called the Sustainable Sanitation System. As one of the actual case, the pilot project in Miyako island incorporating a Bio-toilet for fecal treatment and a constructed for non-fecal treatment in order to reduce load to environment and utilize nutrient resource was introduced. The COD and T-P of the effluent of the constructed wetland were around 30 mg/l and 0.3 ppm respectively due to the low loading. Thus, the water quality of the constructed wetland is equivalent to that of septic tank. In addition, energy efficient is better than septic tank.As a result, it is revealed that this system is operated well and Sustainable Sanitation System can reduce environmental load.

Keywords: Sustainable sanitation system , dry-toilet, Bio-toilet, constructed wetland, intermittent operation

References

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