World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:19, No:04, 2025

Environmental Degradation and Mitigation Measures: A Case Study of Nepal

Authors : Megha Raj Regmi

Abstract : Nepal is a Himalayan country, land-locked and sandwiched between two neighboring mammoths, China and India. Kathmandu, the capital Valley, is a conglomeration of historical and World heritage cities in the central part of Nepal. All the rivers and rivulets that originate from this middle mountain valley, drain into the major river Bagmati, a tributary of the Ganges. Not so long ago the Bagmati, which is sacred to all the Hindu populace, used to be the source of sustenance to the people, and abundant fauna and flora in the Valley and downstream. At present all the sewerage systems within the Valley directly discharge effluent into the streams nearby. The pollutants thus being fed into the tributary streams have rendered the river useless, just as a wastewater drain. Rapid urbanization and absence of reliable wastewater treatment facilities are the major causes of river pollution. Kathmandu, the capital city having a population of one and half million, has only one functional wastewater treatment plant among the seven wastewater treatment plants. The per capita income of Nepal is 1300 US$; the monthly tariff of electricity for the operation of this extended aeration type treatment plant is US$ 700 with subsidy. The deep oxidation ditch of carousel type has been designed for the discharge of 0.20cumec to treat the sewage containing BOD5 of 270 mg/l and the COD of 1150 mg/l to maintain a modicum of treated water flow in the sacred stretch around the Pashupatinath temple. A model Eco toilet has been designed such that urine and faeces get separated. The faeces are then dehydrated and decomposed with and without solar radiation. As against the normal condition, where the faecesare to be used as soil conditioner in the model with solar radiation, the faeces got decomposed in forty eight days period. The diluted urine with eight parts of water is used as fertilizer for agriculture. Also from the observation by many people on a cluster of the pilot project, annually per person recovered value of N (Nitrogen), P (Phosphorous) and K (Potassium) was found to be 5kg, 0.399Kg, 1.099 Kg, respectively. The combination of decomposed excreta thus received is expected to suffice the local fertilizer needs. The study thus found the Eco toilets to have a clear advantage over the traditional water borne sanitation. This paper presents an in-depth review of the present scenario of the water supply situation of Nepal. Similarly, this paper deals with different types of Eco toilets, their performance and feasibility in the context of Nepal, based on complete laboratory analysis and regular monitoring, as well as river restoration to a healthy state, including biogas generation from excreta.

Keywords : bio- gas public toilet, low cost technology, sustainable sanitation, total sanitation
Conference Title : ICWMRE 2025 : International Conference on Waste Management, Recycling and Environment
Conference Location : Toronto, Australia
Conference Dates : April 03-04, 2025