



Dr. Marla M. Redillas

Dr. Marla M. Redillas is an Associate Professor and Head of the Hydraulics and Water Resources Division, Civil Engineering department De La Salle University, Manila, the Philippines. She has been professional Civil Engineer for more than 12 years. She has done her Masters (2009) and PhD from Kongju National University, Cheonan, South Korea (2012). Moreover, she has conducted research in 13 domestic research projects. Her research interests include water quality; diffuse/non point source pollution characterization and management/control; urban/agricultural storm water runoff treatment using constructed wetland, structural best management practices (BMPs), low-impact development (LID), and green infrastructure (GI) technology. She has also served as Secretary in International Relations Committee, Korean Society of Hazard Mitigation (KOSHAM). She is currently a Board Member of the Diffuse Pollution and Eutrophication Specialists Group of the International Water Association (IWA). She was recently awarded as one of the Outstanding Young Scientist 2019 of the National Academy of Science and Technology (NAST) Philippines.

SUSTAINABLE DEVELOPMENT IN SMART URBAN CITIES

Abstract: Urban areas are faced with multiple problems like high-rise buildings and their pollution, roads, parking lots, vehicular non-point sources, and high loading rates of other pollutants. In this sorry state, sustainable development remains a mere distant dream. As per literature available, roads and paved buildings have high characteristics of stormwater run-offs, peak flow discharges, and high pollutant run-off. Infiltration trenches are also recommended to be used in order to provide first-hand pretreatment facilities. Roof land-use contains less pollutant possession than other similar types. Low-impact development (LID) is another method which could be applied in smart cities. Low-impact development is the leading management practice which regulates and treats stormwater runoff especially in highly impervious urban areas. Non-point pollution can be countered by using constructed wetlands. An infiltration trench equipped with an extensive pretreatment and filter bed consisting of woodchip, sand and gravel was utilized as a low impact development technique to manage stormwater runoff from a highly impervious road with particular emphasis on heavy metal removal. Apart from LID, bioretention is another method to avoid over-accumulation of pollutants within cities. It is composed of engineering plants and soil, wherein several processes occur thereby urban run-off is treated. It also results in nitrogen removal caused by the soil microbial activities, nitrification, de-nitrification and bioremediation.

Keywords: Stormwater; run-off; Smart-city; LID; Bioretention; Sustainable; Development