# Introducing a Cost Effective Treatment Process to Improve the Effluent Water Quality of Natural Rubber Processing Factories

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Most natural rubber processing factories in Sri Lanka tends to discharge their effluent water without treating properly or directly into the nearest stream as proper treatment processes reduce their profit. The objective of this study is introducing a cost effective and commercially viable treatment process to treat the effluent water generated from natural rubber processing factories. The proposed cost effective treatment process includes two treatment steps mainly as Pretreatment Process and Biological Treatment Process. In the Pretreatment Process Total Suspended Solids (TSS) and the Turbidity of the effluent water are reduced using a natural coagulant, and in the Biological Treatment Process the amount of Nitrate and Sulphate dissolved in the effluent water are biodegraded using facultative anaerobic bacteria. As the natural coagulant in the Pretreatment Process Bentonite clay is used and to increase the surface area for the growth of anaerobic bacteria in the Biological Treatment Process a bio brush media made up of bristle fibre coir is used. The effectiveness of proposed treatment process was analysed using effluent water samples collected from eight natural rubber processing factories. In the analysis pH, TSS, Turbidity, Total solids, Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Sulphate and Nitrate contents were measured before and after the treatment process. The proposed cost effective treatment process can reduce the TSS content even below the permissible value of 100 mg/1(Turbidity and TSS reduction up to 97% and 54% respectively) and it can reduce the BUD and COD values very close to the permissible levels of 50 mg/l and 400 mg/lrespectively (BOD and COD reduction up to 79% and 70% respectively). Sulphate and Nitrate biodegradation efficiency is nearly three times higher when using the introduced bio-brush media as it increases the surface area for anaerobic microbial growth. As Pretreatment Process needs about 6 hours of contact period and Biological Treatment Process needs about 15 days of contact period, this process is more suitable for medium scale natural rubber processing factories where large amount of effluent water is not produced daily.

Keywords: Waste water treatment, Biological treatment, Cost effective treatment