ABSTRACT

TANTO PRATONDO UTOMO. Design of Crumb Rubber Production Process based on Cleaner Production. Under the direction of ANAS MIFTAH FAUZI, TUN TEDJA IRAWADI, MUHAMMAD ROMLI, AMRIL AMAN, dan SUHARTO HONGGOKUSUMO.

Rubber industry is one of heavy polluted industry that needed to be improved. The improvement of this industry will also result in the increase of process efficiency and cost reduction.

The objectives of this research were to identify processing stages for cleaner production application; to produce crumb rubber improved processing stages which were more efficient in resources usage and lower in environmental risks based on environmental and economical profit; and to design crumb rubber production process based on cleaner production.

The results showed that the crumb rubber processing stages which were potential for cleaner production implementation were latex field coagulating stage; rubber coagulum storing; block rubber re-sizing and cleaning stages; water saving effort by water recirculation from into block rubber re-sizing and cleaning stages.

Based on environmental benefit aspects, rubber coagulum should be in form of dry, an, and thin rubber sheet, and could use coagulant which was added by anti-oxidant anti-bacteria compounds. Meanwhile based on economical benefit aspects, these alternatives could decrease of investment, shortened the crumb rubber processing stages, and reduced the types and volume of waste.

Simulation implementation of the recommended crumb rubber production process scenario resulted saved up to 50 percent of transportation cost; shortened the crumb rubber processing stages and saved up to 81 percent of water, 61 percent of electricity, 71 percent of man power; saved up to Rp.12,800/ton dry rubber of equipment investment; saved equal to Rp. 95,000/ton dry rubber of delay time during 14-day pre-drying period; and saved equal to Rp. 2,000/kg dry rubber of malodor treatment facility investment. The recommended crumb rubber production process would increase farmer income due to elimination of off grade block rubber discount price.

Simulation of implemented design scenario of crumb rubber production process was feasible if it was implemented in 6.000 ha of rubber tree with 1.000 kg dry rubber/ha.year of productivity.

Keywords: cleaner production, production process, crumb rubber, rubber coagulum