In this study, environmental performance of a textile mill employing fiber production and subsequent dyeing was evaluated in detail. Cleaner production assessment studies based on Integrated Pollution Prevention and Control (IPPC) principles were conducted. Specific water and chemical consumptions in wet processes were calculated using mass balance analysis. The potential wastewater and/or chemical recovery and reuse options were determined. A company-wide chemical inventory study was conducted and the chemicals were evaluated in terms of their toxicological effects. It was found that a total of 29 chemicals should be replaced with less toxic and more biodegradable counterparts. By the application of suggested cleaner production options, the potential reductions in water and chemical consumptions and wastewater generations were determined. After the implementation of good management practices, wastewater recovery and reuse, machinery modifications, and chemical optimizations/replacements, the following reductions could be achieved: water consumption: 35 - 67 %, chemical consumption: 25 - 51 %, total wastewater flowrate: 37 - 70 %, COD load: 44 - 58 %. Thus, about 51 and 32 % savings could be achieved for water/wastewater and chemical costs. It was found that by the application of various suggested cleaner production techniques the payback periods of such investments range from 4 to 36 months.