

The potential of life cycle management for sustainable production of sugar at Mumias sugar company, Kenya

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Abstract:

As the international community continues to embrace sustainability thinking in decision making, the sugarcane industry too has to adopt and operate within principles of sustainable entrepreneurship. A key input in this evolving paradigm is application of Life Cycle Management approach, whose focus is to determine sustainability concerns at all stages of a product's life cycle so as to attune business to economic viability, social responsibility and environmental soundness. This study assessed the potential of Life Cycle Management in the sugar industry focusing on Mumias Sugar Company. The study was aimed at evaluating the management of impacts at sugar production, transport, processing and waste management. Data were collected using focused group discussions, observation, key informant interviews and laboratory analysis methods. The scope of the study was restricted to environmental concerns. Data from Key informant interviews and focussed group discussions were transcribed and analysed based on thematic areas. Results showed that, at the farm level, continuous cropping, lack of adherence to contracts by the company and sugarcane fires were identified as key factors affecting productivity. At the transport phase, poor state of feeder roads and poor sugarcane stacking were responsible for significant sugarcane spillage losses thus directly lowering the farmer's income. At the sugar processing phase, high waste generation evidenced by high values of Chemical Oxygen Demand (1430mg/l), Biological Oxygen Demand (605mg/l), and Total Suspended Solids (347.5 mg/l) in the treated wastewater from the factory compared to critical standard values (BOD maximum=30mg/l, OD maximum=50mg/l, total Suspended solids maximum=30mg/l). High levels of the above parameters deprive aquatic plants and animals oxygen required for respiration. Also noted was high water consumption levels (8640M³) with recycling putting pressure on the water source (River Nzoia). High pollution levels of Nitrous oxide, carbon monoxide (1,748,494 tonnes per year) and carbon dioxide (2,747,527 tonnes/year) At the waste management phase, there was limited utilization of molasses whereby it was only being used as an animal feed and industrial use to produce denatured spirits. Opportunities for industrial symbiosis exist for transforming molasses into bio-ethanol production which is used to blend petrol for use as motor vehicle fuel with minimum tail emissions. Use of polythene bags for packaging retail sugar adds to the plastic menace thus undermining best practices. Filter mud was used as a soil conditioner without planned monitoring for heavy metals (Cadmium (10ppm) and Zinc (8ppm)) although their levels were below critical levels but could in the long run bioaccumulate thus affecting productivity. There was lack of declaration of impacts of inputs used sugar production process providing a challenge on control of emissions at source. Mumias Sugar Company needs to adopt sustainable procurement where all suppliers of inputs are required to declare the environmental impacts of their products thus eliminating inputs with high environmental emissions. There is need for monitoring of contractors on land preparation, harvesting and transport so as to comply to set guidelines. Mumias Sugar Company should also honour contracts signed with farmers to avoid losses due to late harvesting. There is need for improvement of roads through the public private sector partnership. Sugarcane loaders need to be sensitized to avoid over staking of cane that leads to spillage. There is need for adoption of green procurement that will require declarations of all environmental impacts of all the inputs in the sugar production process.