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### **RECP Experiences at Musoma Textile Mills Tanzania Limited (MUTEX)-Tanzania**

The efficient and environmentally sound use of materials, energy and water - coupled with the minimization of waste and emissions - makes good business sense. Resource Efficient and Cleaner Production (RECP) is a way to achieve this in a holistic and systematic manner. RECP covers the application of preventive management strategies that increase the productive use of natural resources, minimize generation of waste and emissions, and foster safe and responsible production. Benefits are eminent in many enterprises, regardless of sector, location or size, as demonstrated by the experiences of **Musoma Textile Mills Tanzania Limited (MUTEX) in Tanzania.**

#### **Achievements at a Glance**

RECP implementation has enabled MUTEX to reduce rejects from 21% to 5.8% and increase the product yield from 89% to 94.2%. The entire RECP programme achieved a total annual saving of more than USD 293,322.



Introduced new products (Khanga-Batik)

#### **Overview**

Musoma Textile Mills Tanzania Limited (MUTEX) is one among the three textile mills in Tanzania owned by Mohamed Enterprises Tanzania Ltd Group (MeTL), the largest textile producer in Sub-Saharan African countries. The Industry is located at Rwamlimi Industrial Area, Bweri ward-Musoma Municipality in Mara Region. It was established in 1980 as a parastatal organization. The company produces 100% cotton fabrics for both local and international markets. The installed capacity is 1.0 million meters per month. Currently it has 150 employees.

The RECP training conducted by the Cleaner Production Centre of Tanzania in November 2011 has helped the industry to adopt several RECP options and as a result improving its resource efficiency and environmental performance. Some notable benefits achieved include resource recovery (Caustic soda), enhanced energy and water efficiency, emission reduction, solid waste reduction, waste water reduction and improved occupational health and safety conditions.

## Benefits

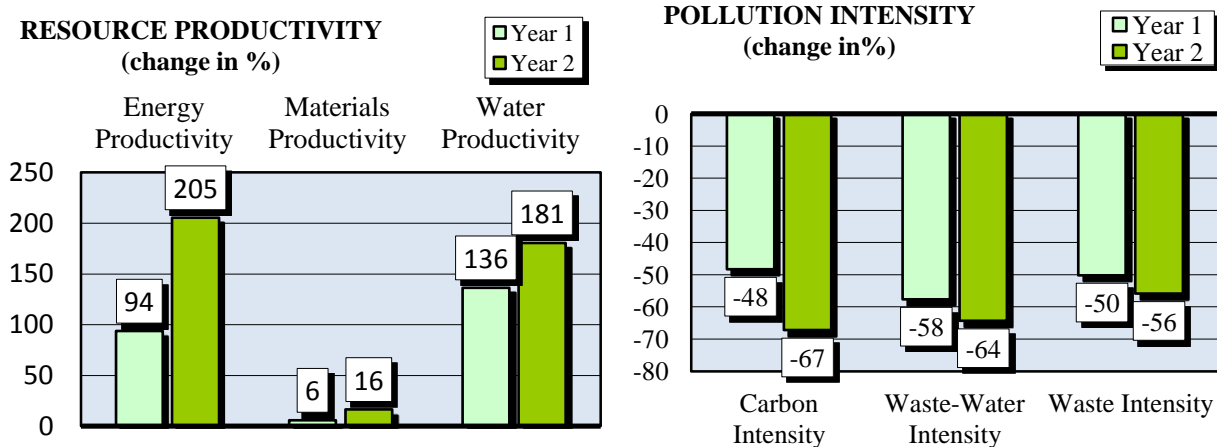
Musoma Textile Mills (T) Limited has in place a RECP team which is responsible for Resource Efficient and Cleaner Production activities at the company. The management, which forms part of the RECP team, is highly committed to overseeing and facilitating the implementation of RECP options. So far the RECP team has managed to come up with Environmental and RECP policies for the industry. With the team in action, the industry has managed to make several improvements in different areas such as material use, energy and water efficiency, emission reduction, solid waste generation and waste water reduction.

**Table of Results at a Glance**

Absolute Indicator	Change (%) year 1	Change (%) year 2	Relative Indicator	Change (%) year 1	Change (%) year 2
<b>Resource Use</b>			<b>Resource Productivity</b>		
Energy Use	17	-15	Energy Productivity	94	205
Materials Use	114	123	Materials Productivity	6	16
Water Use	-4	-7	Water Productivity	136	181
<b>Pollution generated</b>			<b>Pollution Intensity</b>		
Air Emissions	17	-15	Carbon Intensity	-48	-67
Waste-Water	-4	-7	Waste-Water Intensity	-58	-64
Waste	13	15	Waste Intensity	-50	-56
<b>Product Output</b>	127	160			

*Note: The **absolute indicator** gives a measurement of how much resource use/pollution output has changed in absolute terms e.g. units of energy used or tons of waste generated. A negative percentage indicates a decrease and a positive percentage indicates an increase. The **relative indicator** gives a measurement of changes in resource use/pollution in relation to production output. **Resource productivity** provides a measurement of how much product output can be produced relation to resource used, from a sustainability point of view, productivity should increase. **Pollution intensity** provides a measurement of how much pollution is generated per unit of production output, from a sustainability perspective, intensity should decrease.*

## RECP Profile



*Note: The RECP profile provides a visual overview of resource productivity and pollution intensity shown as change in percentage compared to the baseline values. Environmental performance is improved when resource productivity increases and when pollution intensity decreases.*

### Table of Options implemented

Options Implemented	Investment (USD)	Saving (USD)	Environmental Benefits
<p><b>Water and waste water management</b></p> <ul style="list-style-type: none"> <li>Control of leakages</li> <li>Re-use of water in caustic soda dissolution unit</li> <li>Installation of new pumps and pipes</li> <li>Closed loop water management system (the wastewater is re-used in the cotton farms for irrigation)</li> <li>Rehabilitation of ETP (from original ETP system)</li> </ul>	21,632.20	4410.00	<ul style="list-style-type: none"> <li>Reduction in water consumption by 3500m<sup>3</sup>/yr</li> <li>Increase in water productivity by 136% in the first year and 181% in the second year</li> <li>Reduction in waste water discharge into the lake by 3500m<sup>3</sup>/yr</li> <li>Reduction of approximately 64% of waste water disposed into the lake</li> <li>Environmental compliance</li> </ul>

Options Implemented	Investment (USD)	Saving (USD)	Environmental Benefits
<p><b>Materials and solid waste management</b></p> <ul style="list-style-type: none"> <li>Recovery of used caustic soda in mercerization process i.e. 300kg/day</li> <li>Re-use of auxiliaries (e.g. Surfactants)</li> <li>Process modification</li> <li>Introduction of new products (Khanga-Batik)</li> <li>Re-use of solid waste (ash) as manure in cotton farm.</li> </ul>	81,517.50	57,024.00	<ul style="list-style-type: none"> <li>Reduction in use of caustic soda</li> <li>Increase in material productivity by 6% in 1<sup>st</sup> year and 16% in the 2<sup>nd</sup> year.</li> <li>Reduced rejects from 21% to 5.8%</li> <li>Increase in the product yield from 89% to 94.2%</li> <li>Reduced COD concentration in waste water</li> <li>Reduced solid waste</li> <li>Elimination of synthetic fertilizer in farming</li> <li>Reduction in pollution load to the environment</li> </ul>
<p><b>Energy and Emissions management</b></p> <ul style="list-style-type: none"> <li>Replacement of old water pumps with new ones of lower energy consumption</li> <li>Use of energy saver lights</li> <li>Installation of power factor correction device</li> <li>Modification of HFO boiler to <b>biomass boiler</b></li> <li>Re insulation of water and steam pipes</li> <li>Replacement of old machinery</li> <li>Modification of Chimney stack height</li> <li>Installation of wet scrubber (smoke soot trapper)</li> </ul>	14,250.00	17,867.98	<ul style="list-style-type: none"> <li>Low consumption of energy due to high machine efficiency</li> <li>Improvement of the quality of steam</li> <li>Reduction in heat energy loss to the environment</li> <li>Reduction of CO<sub>2</sub> emission to the environment</li> <li>Reduction in GHG emissions</li> <li>Reduction of soot smoke to the environment</li> </ul>

## Approach Taken

The concept of Resource Efficient and Cleaner Production was adopted by MUTEX after being trained by the Cleaner Production Centre of Tanzania in November 2011. Thereafter the management decided to implement the RECP concept by first forming a RECP team comprising members that were drawn from various departments. The RECP team, in collaboration with CPCT, conducted detailed assessment focusing on waste water and energy management. In waste water management the effluent treatment plant was rehabilitated to improve the quality of the effluent discharged and re-use 64% of treated water in irrigation of the cotton farm at the premises. As for the energy management the company took an initiative to replace two old pumps with the capacity of 35hp each with one pump whose capacity is 15hp. It also replaced

about 60 high pressure sodium lamps of 250 watts with fluorescent tube lights of 40 watts. Concerning waste water management, the industry has a closed loop water management system which re-uses process water for irrigation of sunflower and cotton farm. Furthermore the industry has made changes in the industrial process.

### **Business Case**

There has been tremendous improvement in the quality of the products. Results show that RECP implementation has enabled the industry to increase its product yield from 89% to 94.2%. This has consequently improved the company business and made it more competitive. As deduced above, through RECP MUTEX Company has benefited as follows:

1. The company has succeeded to recover 6 bags of caustic powder per preparation of dissolution which is equivalent to USD 57,024 saving per year.
2. The product yield increase from 89% to 94% generated annual revenue of USD 30,420.
3. Before adoption of the RECP concept textile production and sales at the company depended on seasons of the year with June to December being the peak season. With the implementation of RECP the product yield increased by 15%; subsequently the company has introduced a new product, Khanga –Batik, whose demand in the market has been very high throughout the whole year of 2013. This has eliminated the season based business.

### **Testimony**

The Cleaner Production Centre of Tanzania (CPCT) is an autonomous not -for-profit Trust which was registered under the Trustees Incorporation Ordinance, Cap 375 in April 2005. The CPCT evolved from two projects: the worldwide UNIDO/UNEP National Cleaner Production Centres (NCPCs) project which started in October 1995 and the NORAD funded five-year programme on “Cleaner Production for Ecologically Sustainable Industrial Development in Tanzania”, that was implemented by the Centre, under the Vice President’s Office, from December 1999. CPCT provides training, information, assessment and policy advice to a wide range of clientele in the country mainly industries, service businesses, government ministries, public and private sector institutions, academia, and NGOs/CBOs on issues related to environmental management and RECP concepts, methods, policies, practices and/or technologies.

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