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## **RECP Experiences at Nile Perch Fisheries Ltd- 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 **Nile Perch Fisheries Ltd in Tanzania**.

### **Achievements at a Glance**

Nile Perch fisheries Ltd started implementing Resource Efficient and Cleaner Production in January 2010. After the first year of RECP implementation the yield increased by 1%, water usage decreased by 10% and resulted in saving of USD 11,250. The Cleaner Production concept also helped the company to implement eco-labelling concept for fair trading and the implementation of ISO 22000 and BRC GLOBAL STANDARD-2005 FOR FOOD SAFETY. After two years of RECP implementation there was a significant reduction in water usage, solid waste generation as well as waste water. The yield increased further by 3.5 % from 44 to 47.5 percent through improved utilization of raw material, better supervision, complete utilization of solid wastes to saleable by-products and hence increasing their value. Nile perch has achieved 0% of solid organic wastes i.e. no solid organic waste dumped to the environment. These strategies have resulted in annual savings of USD 506,224.



**Before RECP: Disposed as solid wastes**



**After RECP: Converted into saleable by-products**

### **Overview**

Nile Perch Fisheries Ltd is one of the pioneers in processing Nile Perch from Lake Victoria. The company is located at Nyakato industrial area in Mwanza, Tanzania. It started its production commercially in December 1992. The company is engaged in the processing and exporting of Lake Victoria Perch (*Lates niloticus*) and strives to be one of the best factories to do so through its dedication to quality and customer satisfaction. The company gained its approval to export products to the European Union (EU Approval No. 208) in 1995 and has also registered its

premises with the Food and Drug Administration (FDA) of USA and with the Tanzania Food and Drug Authority (TFDA). Owing to the fact that fish processing consumes a lot of water and energy and plays a significant role in environment pollution due to discharge of solid and liquid wastes hence during the first RECP in-plant assessment, four priority areas of yield, reduction of solid wastes, water use, environmental compliance and energy were selected.

**Benefits**

Before RECP application at Nile Perch Fisheries Ltd the specific water consumption was 12-15 m<sup>3</sup> per ton of raw fish. Through implementation of several RECP measures on water management, the specific water consumption was improved to 8-9 m<sup>3</sup> per ton of raw fish resulting in savings of USD 48,243 in 2013, equivalent to a reduction of 38% in water consumption and minimization of waste water generation by 55,300 m<sup>3</sup>. Moreover cleaner production techniques were able to bring down the initial BOD of waste water prior to treatment at the ETP from an average of around 1000 mg/l to about 300 mg/litre, this enabled final treatment at ETP to be more effective and be able to meet required standards of BOD below 30 mg/l and COD below 60 mg/l.

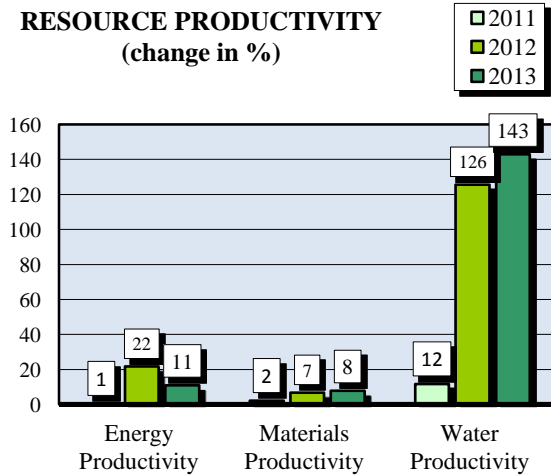
**Table of Results at a Glance**

Absolute Indicator	Change (%) year 1	Change (%) year 2	Change (%) year 3	Relative Indicator	Change (%) year 1	Change (%) year 2	Change (%) year 3
<b>Resource Use</b>				<b>Resource Productivity</b>			
Energy Use	-7	6	4	Energy Productivity	1	22	11
Materials Use	-9	20	8	Materials Productivity	2	7	8
Water Use	-17	-43	-52	Water Productivity	12	126	143
<b>Pollution Generated</b>				<b>Pollution Intensity</b>			
Air Emissions	-7	6	4	Carbon Intensity	-1	-18	-10
Waste Water	-17	-41	-50	Waste-water Intensity	-11	-54	-57
Waste	-64	-60	-65	Waste Intensity	-62	-69	-70
<b>Product Output</b>	-7	29	16				

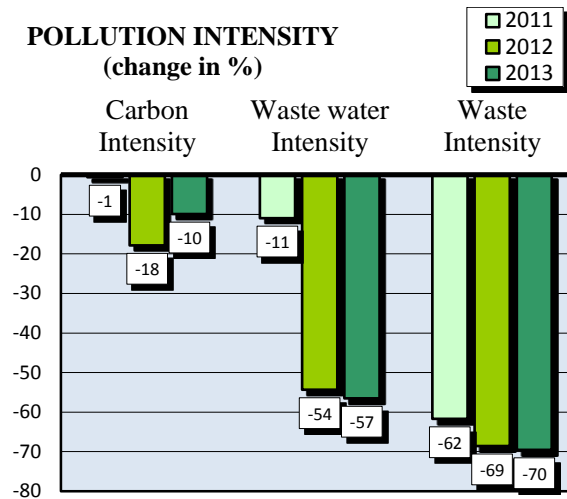
**Note:** The *absolute indicator* provide a measurement of how much resource use/pollution output has changed in absolute terms e.g. units of energy used or tons of waste generated. A negative percentage indicates a decrease and a positive percentage indicates an increase. The *relative indicator* gives 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

**RESOURCE PRODUCTIVITY**  
(change in %)



**POLLUTION INTENSITY**  
(change in %)



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

Table of Options Implemented

Principal Options Implemented	Benefits				
	Economic			Resource Use	Environmental Impact
	Investment [USD]	Cost Saving [USD/yr]	Payback period	Reductions in energy use, water use and/or materials use (per annum)	Reductions in waste water, air emissions and/or waste generation (per annum)
<b>Water Management</b> <ul style="list-style-type: none"> <li>Introduction of self-closing devices in urinals, toilets and hand washing stations</li> <li>Awareness raising to workers on minimization of water usage through posters and training</li> <li>Use of pressure guns</li> <li>Dry cleaning</li> </ul>	USD 1,100  USD 275	USD 48,243	< 1 month	Reduction in water use by 38% (55,300m <sup>3</sup> ) (2010 to 2013)	Reduction in waste water generation by 55,300 m <sup>3</sup>
<b>Wastewater Management</b> <ul style="list-style-type: none"> <li>Drainage filters in all sections to separate large particulate matter and sedimentation tanks to settle out suspended solids.</li> <li>Construction of waste water treatment plant</li> </ul>	USD 1,000  USD 375,000 (Tshs 600 Million)	USD 11,250  Yet to be quantified	< 1 Month  Yet to be calculated	Reduction in waste water generation by 43,268m <sup>3</sup>  Reduction of water usage as a result of not using good potable water for unproductive use.	Reduction in waste water generation by 43,268m <sup>3</sup>  Reduction of water usage as a result of not using good potable water for unproductive use.

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<b>Energy Management</b> <ul style="list-style-type: none"> <li>Introduced evaporative condensers as new technology in place of shell and tube condensers used to cool NH<sub>3</sub> refrigerant.</li> <li>De-lamping by replacing master switch with individual section switches</li> <li>Employees awareness raised to switch off lights when not needed</li> <li>Introduction of insulated bins for storing materials to replace all-metal bins one</li> </ul>	USD 25,000  USD 1000	USD 41,838		Reduction in energy consumption	7% improvement in energy productivity in 2013 compared to 20 percent in 2012. This decrease is due to the addition of new machinery e.g. a 20 ton capacity flake ice machine and commissioning of the ETP in 2013.
<b>Solid Waste Management</b> <ul style="list-style-type: none"> <li>Selling skins, scales, skeleton, trim bits to vendors for animal feed production instead of dumping as previously done</li> <li>Installed permanent screens to filter solids (trimming &amp; filleting sections)</li> <li>Increased number of solid waste captive chambers</li> <li>Introduction of re-usable polythene sheets for blast freezing which can be used 3-4 times after cleaning.</li> <li>Selling used polythene sheets to vendors for recycling</li> </ul>	No additional investment cost	USD 93,750 (Tshs 150 million)		Improved the handling of waste material and converted them as by- products.  54% reduction on polythene sheets usage (from 100kg/day) to 36 kg/day)	Reduction in solid waste generation by 652,045kg
<b>Materials Management</b> <ul style="list-style-type: none"> <li>Increasing the overall yield by 3.5% through improved filleting techniques, training, supervision and continuous monitoring of employees</li> <li>Use of a pump to dispense liquid soap.</li> </ul>	USD 200	Gross savings of USD 506,224  USD 2000	instant	Finished product yield has increased from 44% in 2010 to 47.5 % in 2013	54% reduction on polythene sheets usage (from 100kg/day) to 36 kg/day)
<b>Total</b>	<b>403,575</b>	<b>703,305</b>			

## **Approach Taken**

Nile Perch Fisheries Ltd started implementing RECP concept in 2010 following the initiation of the Cleaner Production technologies project implemented by the Cleaner Production Centre of Tanzania (CPCT) under the Lake Victoria Environmental Management Project Phase II (LVEMP II). A technical team from CPCT visited the factory and explained to the management about the importance of RECP concept as a basic tool for achieving both financial savings and environmental benefits. The management committed itself to implementing the RECP concept by forming a functional RECP team led by the plant manager. The team identified areas of improvement in the operations of the company and came up with RECP options whose implementation started immediately.

## **Business Case**

Nile Perch Fisheries Ltd has gained in various ways due to the implementation of the RECP program. Apart from the significant direct benefits of Resource Efficient and Cleaner Production as outlined before, the company has also realized that RECP certification is a proof of environmental compliance and will assist in the implementation of Eco- labelling project. Eco-friendly products have increasingly become a requirement by major clients /customers all over the world who believe and promote the ideals of sustainable consumption and production.

## **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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