

IMPLEMENTATION OF CLEANER PRODUCTION IN MICRO-TANNERIES IN VILLAPINZÓN AND CHOCONTÁ, COLOMBIA

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INTRODUCTION

Cleaner Production (CP) is a strategy for the promotion of environmental, socio-economic and institutional improvements in human activities. In the industrial activities, CP aims to achieve eco-efficiency by anticipating, preventing and reducing the polluting effects of the emissions (UNEP, 1994). In this project, a process of CP implementation has been developed in micro-tanneries in Villapinzón and Chocontá, Colombia. The industrial community of this region is characterized by handcraft production processes, incipient technology, deficient infrastructure and lack of controls and registers in processes and products. The micro-tanneries' owners have difficulties scaling-up in the social ladder.

OBJECTIVE

The objective of this research is to implement CP, as an environmental solution, in micro-tanneries of Villapinzón and Chocontá. This research contributes to the rivers' integrated water management and to sustainability of micro-industries.

CHALLENGE

The challenge of this research is to find how to empower the tanners' community as they implement CP and confront their socio-cultural and economic barriers.

BACKGROUND

This research is based on a high level of participation of the tanners. It has recognized their needs and interests. Modifications of the CP implementation have emerged from the deep knowledge given by the tanners' experience.

METHODOLOGY



1. BASIS LINE: DIAGNOSIS 2008

Indicators (kg-m3/T)	Average	SD
Sodium sulphide	9,05	3,13
Lime	51,74	17,20
Chromium salt	39,18	13,26
Water	12,39	6,79

WITH PHYSICOCHEMICAL TREATMENT (4)*		
Indicators (kg/ton)	Average	SD
BOD	6,08	10,35
Chromium	0,64	1,27
TKN	1,43	2,04
Chlorides	36,13	58,46
Sulphide	0,33	0,65
TSS	8,70	17,10

WITHOUT PHYSICOCHEMICAL TREATMENT (8)*		
Indicators (kg/ton)	Average	SD
BOD	43,69	26,83
Chromium	1,16	2,19
TKN	4,26	3,99
Chlorides	62,55	48,39
Sulphide	4,88	3,86
TSS	25,31	18,58

Indicators (kg/ton)	Average	SD
Unhairing wastes	129,46	49,81
Defleshing wastes	289,26	113,33
Shaving wastes	125,63	92,29
Leather trimming	24,13	8,85

2. LITERATURE REVIEW AND SELECTION

BAT	Soaking with biodegradable products
	Ecologic unhairing with hair immunization
	Unhairing bath recycling
	Deliming with nitrogen free products
	High chromium exhaustion
GOP	Processes standardization
	Order and cleanliness
	Chemical inputs handling
	Emergencies and accidents
	Personal protection elements
	First aid kit
	Machinery maintenance
	Control elements

RESULTS

3. PRACTICAL EXPERIMENTS

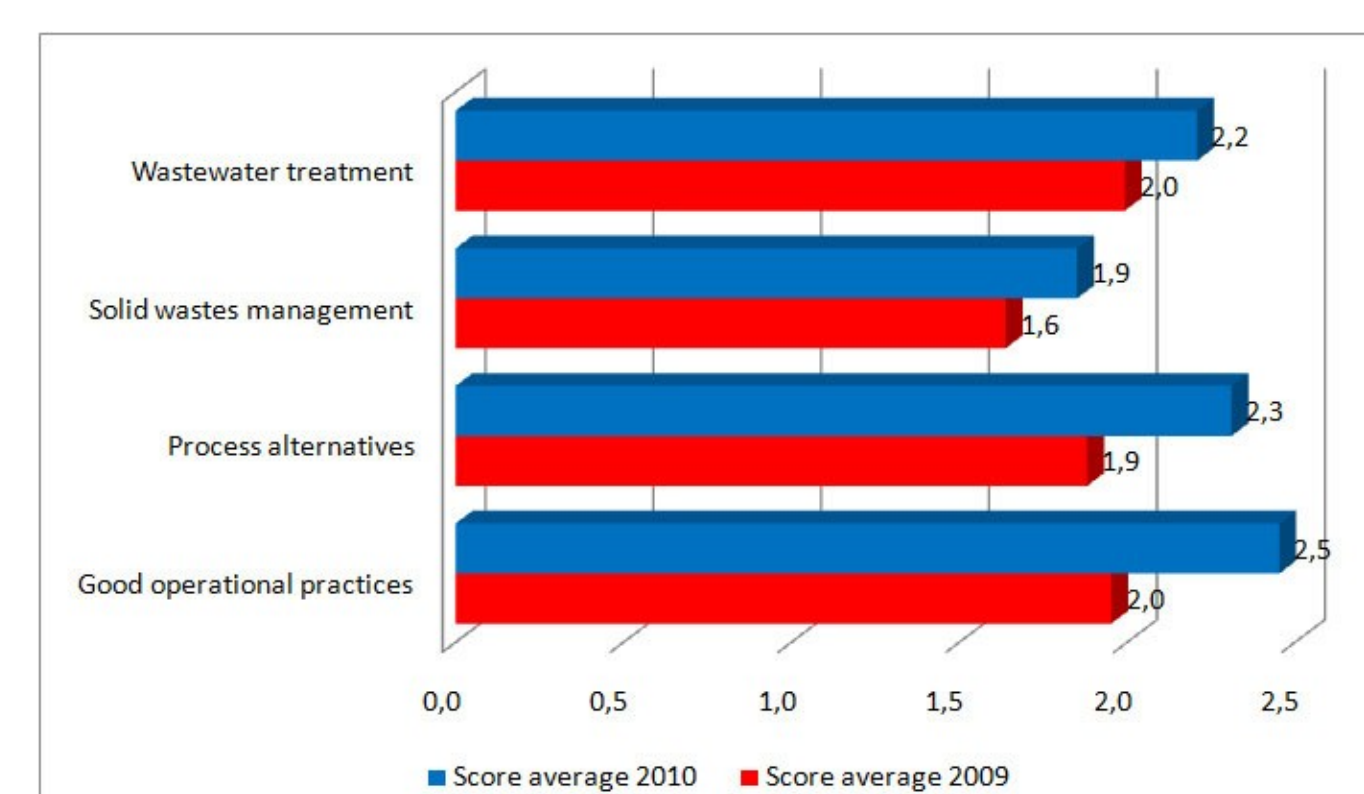
Parameter	Saving range
SOAKING Basis line: Diagnoses 2008 Three experiments	Water (Input) (m3/ton) -6 to 52%
	BOD (kg/ton) 46 to 84%
	TSS (kg/ton) 65 to 89%
	Cl (kg/ton) -22 to 95%

Parameter	Saving range
UNHAIRING Basis line: Diagnoses 2008 Three experiments	Water (input)(m3/ton) -54 to 58%
	Lime (kg/ton) 20 to 43%
	BOD (kg/ton) 11 to 63%
	TSS(kg/ton) 73 to 91%
	Sulphides(kg/ton) 85 to 89%

Parameter	Saving range
DELIMING Basis line: Diagnoses 2008 Five experiments	TKN(kg/ton) 45 to 98%

Parameter	Saving range
TANNING Basis line: Diagnoses 2008 Three experiments	Chromium (kg/ton) 26 to 33%
	Chromium (kg/ton) 22 to 90%

4. FOLLOW UP AND ASSESSMENT*



* The innovation introduced by the tanners in the control processes reinforced the positive results.

CONCLUSIONS

- The deviation presented in the indicators in terms of diagnosis and the wide saving ranges achieved by implementation of best technologies show the typical variation of tanning industry. In this region the variation is reinforced by the lack of controls, standardization, monitoring of records and the degree of informality of these industries.
- The tanners are gradually improving from the most economic and feasible changes to more elaborated and technology-driven adaptations. The trend in the long term has shown that the tanners are successfully adopting behavioural changes towards prevention. These behavioural changes has proven to lead to creative outcomes and innovation.
- Through this project, the role of academia has not been restricted to technical advice but has instead, taken a leading role through a comprehensive approach that started with a conflict resolution process.

REFERENCES

UNEP (1994), *Government Strategies and Policies for Cleaner Production*, UNEP Industry & Environment, Paris.