

MONITORING CLEAN PRODUCTION IMPLEMENTATION IN TANNERIES WITHIN THE FRAMEWORK OF SUSTAINABLE DEVELOPMENT

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INTRODUCTION

CP implementation in Villapinzón and Chocontá tanneries is one of the outstanding SWITCH projects in Colombia, South America. Since 2004, several activities oriented to conflict solving and to building association have been developed. In 2006, the SWITCH Project started with the objectives of reducing polluting wastes and water consumption, based upon cleaner production (CP) techniques adoption by tanners. As a tool for monitoring those projects' impact on the environment, a system of indicators was developed within the framework of sustainable development.

OBJECTIVE

To create a tool for monitoring those projects' impact on the environment.

BACKGROUND

Sustainable development approach (Donovan, Sadler & Bryson, 2005), has been a significant force in implementing environmental management systems, by defining strategies for monitoring effects of changes in industrial practices on the environment.

Colombia has adopted sustainable development as one that "leads to economic growth, increasing life quality and social well being, without depleting renewable resources for the future generations" Art. 3º Ley 99 de 1993.

METHODS

The monitoring measures through defined indicators the changes made to the productive process from the technical, social and economic dimension and determines the impacts of implementing CP. Figure 1.

The monitoring system comprises 58 first-generation indexes, from which three compound indexes (environmental, economic and social) were calculated and formed the basis for estimating Sustainable Development Index. Three different moments of analysis were defined to measure the progress with the aggregation of the indexes in each dimension. The first moment (1) - beginning of the research in the year 2004. The second moment (2) - the year 2008 in which the process of CP implementation begins with the SWITCH environmental diagnosis of the tanneries. The third moment (3) - between 2009 and 2010 in which the process of CP implementation is being followed up.

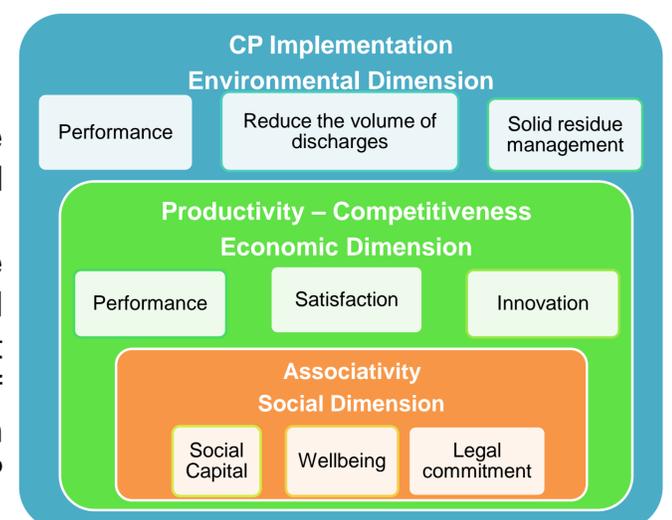


Figure 1. System of Indicators

RESULTS

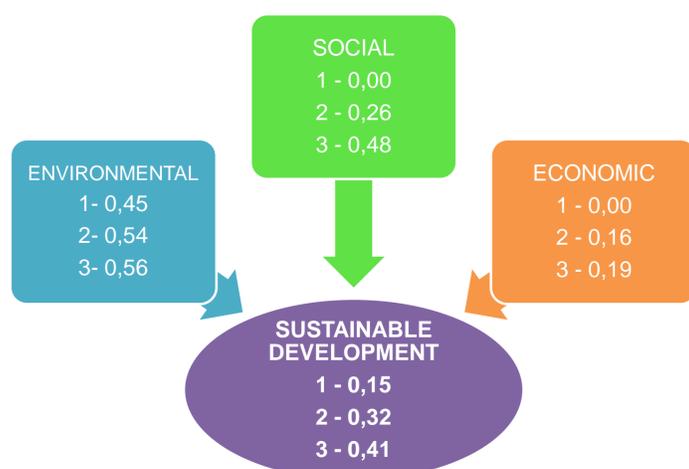


Figure 2. Sustainable development indexes in 3 different analysis moments

A system of indicators was developed within the framework of sustainable development.

The environmental indicators show a significant reduction in pollution loads and on water use in 2009 compared to the year 2004: examples of that being a decrease in the discharge levels of Chromium between (32-68%), of BOD5 between (60-72%) and savings on water use between (24-68%).

A sensitivity analysis of the economic indexes demonstrated that widening the tanneries' product portfolio is a must if improving the competitiveness and profitability is desired in order to assure sustainability.

Finally, the preliminary result on the sustainability index was strongly influenced by the work on the social component, on improving water management and at decreasing chemical input. The progress was more important between moment 1 and 2. At moment 1, the environmental index was found to be 0.45 because the tanners were already treating their water.

In Figure 2, the results of the compilation of indexes of each dimension are shown.

CONCLUSIONS

Each of these indexes was expressed in a formal mathematical way. Initial results at monitoring the CP implementation under the SWITCH Project in 12 micro-tanneries in Villapinzón show that they are obtaining good results in their search for sustainability. This work was strongly supported by the process on conflict resolution and by fighting their social exclusion. Increasing the competitiveness and the profits of such industries should be enhanced by stimulating joint ventures.

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