

Diagnosis of education programs in sustainable consumption and market green policy sustainable production capital district

INGENIERIA AMBIENTAL

Diagnóstico de los programas educación en consumo sostenible y mercados verdes de la política de producción sostenible del distrito capital

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Abstract

This article contains the results of Diagnosis of Education Programs in Sustainable Consumption and Green Marketing Promotion Strategy for Sustainable Consumption Policy Sustainable Production Capital District (1) for the corporate sector was developed.

The diagnosis allowed noting from the priority actions proposed in the Action Plan 2004 Policy for Sustainable Production Capital District was compliance with the Education Program Sustainable consumption but not for Green Markets Programme, although there are other actions that enable identification of related results. In turn, the development of indicators in the medium and long term programs to publicize the Policy on Sustainable Production from the Capital District Environmental Business Management Program (2), and the promotion of the culture of the Sustainable Consumption and Markets suggests greens.

Keywords: *Corporate environmental management program, green markets, policy for sustainable production of capital district, sustainable consumption.*

Resumen

El presente artículo contiene los resultados del diagnóstico de los Programas Educación en Consumo Sostenible y Mercados Verdes de la Estrategia Promoción al Consumo Sostenible de la Política de Producción Sostenible del Distrito Capital (1) para el Sector empresarial.

El diagnóstico permitió evidenciar que desde las acciones priorizadas propuestas en el Plan de acción 2004 de la Política de Producción Sostenible del Distrito Capital hubo cumplimiento del Programa de Educación en Consumo Sostenible pero no para el Programa de Mercados Verdes, a pesar que hay otras acciones que permiten la identificación de resultados relacionados. A su vez, se sugiere el desarrollo de indicadores a mediano y largo plazo de los programas, dar a conocer la Política de Producción Sostenible del Distrito Capital desde el Programa de Gestión Ambiental Empresarial (2), y el fomento de la cultura del Consumo Sostenible y los Mercados Verdes.

Palabras clave: *Consumo sostenible, mercados verdes, programa de gestión ambiental empresarial, política de producción sostenible del distrito capital.*

1. Introduction

Sustainable production and consumption seek to change traditional patterns on the part of the actors immersed in the market society. Framing this change would allow the reduction of pollution, helping the sustainability of biodiversity as well as the integrity of environmental goods and services.

In Bogotá, to comply with this management model, the Sustainable Capital Policy of the Capital District was legislated in 2003 (1), which has as one of its strategies the Promotion of Sustainable Consumption that frames the Green Market Programs and Education in Sustainable Consumption. For the Capital District, the Sustainable Production Policy is the first formulation of a Public Policy related to this concept. This policy has not had a diagnostic process that allows the identification of progress, aspects to be improved and restructured.

Taking into account the above, this paper developed the diagnosis of the Sustainable Consumption and Green Market Education Programs of the Sustainable Consumption Promotion Strategy within the framework of the Sustainable Production Policy of the Capital District, which generated key concepts in the improvement of the Policy under study, from the indicated programs, through the knowledge and analysis of its degree of compliance, its structure and current management by the District Department of the Environment (SDA). The SDA implements a program, input for the present work, which is called the Business Environmental Management Program (BEMG) (2). This is made up of 5 levels, which took into account the companies whose relationship is directly with the programs of Education in Sustainable Consumption and Green Markets, which correspond to Levels II (Sustainable Production), III (Environmental Management System), and V (RED).

Likewise, an integral analysis of the guidelines established by the Ministry of Environment and Sustainable Development (MADS) was developed in relation to the National Plan for Green Markets (3) and the National Policy on Sustainable Production and Consumption (4), years 2002 and 2010 respectively, to achieve the quantitative and qualitative diagnosis of their

results, which presents the legal framework that can be seen in Table 1.

Table 1. Legal framework.

	NATIONAL ORDER	DISTRICT ORDER
POLÍTICAS	Political Constitution of Colombia (1991)	DAMA (2003)
	Min Ambiente (1997). National Cleaner Production Policy	Sustainable Production Policy of the Capital District
	Min Ambiente y Min Educación (2002). National Policy on Environmental Education	
	Min Ambiente Vivienda y Desarrollo Territorial (2010). National Policy on Environmental Education	
PLANES	Min Ambiente Vivienda y Desarrollo Territorial (2002). National Strategic Plan for Green Markets	-

Fuente: Elaboración propia.

2. Methodology

The work was developed in three methodological phases, which are described below, under a descriptive approach of a quantitative nature, given the selection of a series of activities to be diagnosed in relation to the Plan of Action for the year 2004, established in the Production Policy. Sustainable for the Capital District, study and treatment variables in the implementation of the surveys.

In Phase I, the sample is defined as the collection of information in the SDA and MADS entities.

Phase II consists of measuring the scope of companies in the programs under study, where internal surveys were drawn up and applied to companies belonging to the EAG (2) and external surveys to a sample of companies not belonging to the latter. The collection instruments used in Phase I were sources of primary information (direct contact with the subject of study) and sources of secondary information such as documents and

statistics; for Phase II, the collection instrument defined were surveys.

2.1 Phase I: Diagnosis of the fulfillment of the priority activities proposed in the 2004 action plan of the sustainable production policy of the capital district, for the programs of education in sustainable consumption and green markets

During the development of this phase, information was collected on the activities undertaken by the SDA in relation to the programs under study;

Subsequently, based on the compilation, compliance with the activities established in the 2004 Action Plan was verified, which are summarized in Table 2. Additionally, an analysis was made of the interrelation that the District Policy of Sustainable Production had with other National Plans and Policies related to the topics to be diagnosed in this work, after compiling information on the activities undertaken by the MADS.

The information presented in table 2 corresponds to the scope of the proposed priority activities.

Table 2. *Prioritized activities proposed in the 2004 Action Plan of the Sustainable Production Policy for the District Capital.*

Entity	Prioritized activities	
	Program of Education in Sustainable Consumption	Green Market Program
SDA	Action strategies established to promote sustainable consumption	Creation of indicators of environmental performance of products and / or analysis of their life cycle. Inclusion of the topic of green markets in the terms of reference of phase V of ACERCAR Training of the business sector in life cycle analysis of products
MADS	Ecological entrepreneurial literacy within the framework of the Microenterprise Environmental Education of the Cleaner Production Policy of 1997 (5)	Technical assistance in companies (ACERCAR) carried out to identify feasible alternatives in access to clean technologies, as established in the Cleaner Production Policy of 1997 Coordination with the National Strategic Plan of Green Markets (3), a program established in the National Development Plan 2002-2006 and developed by the Ministry of Environment, Housing and Territorial Development (6)

Source: Prepared by the authors, based on the "2004 Action Plan for the Sustainable Production Policy of the Capital District" (SDA, 2004).

2.2 Phase II: Measurement of the scope and perception of companies in the programs of Education in Sustainable Consumption and Green Markets, according to the priority activities proposed in the 2004 Action Plan

To achieve the purpose of this phase, surveys were designed and applied, both to the companies participating in the BEMG Program (2) and to those that are outside it.

2.2.1 Methodology for application of surveys to companies belonging to the BEMG Program of the SDA

For the diagnosis of the Sustainable Consumption Education and Green Market programs of the Sustainable Production District Policy, it was necessary to know specific information of the companies that are part of the different levels of the BEMG Program of the SDA (2). To this

end, two perception surveys were drawn up and applied to companies belonging to levels I and II of the Program, namely: APPROACH and PROMOTION TO PRODUCTION AND SUSTAINABLE CONSUMPTION. In total, 222 surveys were conducted.

2.2.2 Methodology for the application of surveys to companies that do not belong to the BEMG Program of the SDA

As an input for the diagnosis of Sustainable Consumption Education Programs and Green Markets of the District Sustainable Production Policy, the perception of companies that have not participated in the BEMG Program (2) was considered a fundamental part. These will be known in this document as “external companies”.

Based on information provided by the Chamber of Commerce of Bogotá (CCB) related to the total number of legally constituted companies in the Capital District, distributed by location and by economic sector, and using Equation 1, the total number was calculated of companies from which the following information was requested: name, size, address, telephone, commercial e-mail and Uniform International Industrial Code (ISIC).

$$N_h = \frac{TC_h}{TB} = 500 \quad (1)$$

Where:

N_h , is the number of companies requested by the Economic Sector

TC_x , Total companies in Bogotá of the ISIC_h

TB, Total companies of Bogotá

Once the database of the CCB was obtained, the equations 2, 3 and 4 were applied to know the size of the sample that had to be surveyed, having as a total population the number of 500 companies.

$$n = \frac{n_o}{1 + \frac{n_o}{N}} \quad (2)$$

$$n_o = \frac{\sum_{h=1}^H W_h P_h Q_h}{e^2} \quad (3)$$

$$y W_h = \frac{N_h}{N} \quad (4)$$

Where:

n , Sample size to survey

N_h , Total number of companies in the economic sector_h

N , total population size

$Ph = 0,5$

$Qh = 0,5$

z , confidence level

e , error rate

Based on this, the work was developed with a confidence interval of 91%, which reflects an error percentage of 0.09 and a z of 1.69, resulting in a minimum number of companies to be surveyed of 89; Finally, 98 surveys were carried out to external companies.

2.3 Phase III: Formulation of proposals and recommendations that allow contributing to the improvement of the programs

In this phase, as its name indicates, the proposals and recommendations that contribute to the improvement of the diagnosed programs were formulated, previous analysis of the information gathered in the previous phases.

3. Results and discussion

3.1 Phase I: Diagnosis of the fulfillment of the priority activities proposed in the 2004 action plan of the Sustainable Production Policy of the Capital District, for the Programs of Education in Sustainable Consumption and Green Markets

Next, the diagnosis of the progress of the actions undertaken by the SDA in relation to the programs under study is presented, see Table 3.

Table 3. *Diagnosis of compliance with prioritized activities by SDA.*

Program	Priority activity, 2004 Action Plan	Observations	Fulfillment
Education in Sustainable Consumption	Action strategies established to promote Sustainable Consumption	According to SDA Management reports, the action strategy that was established corresponds to the Guide for the implementation of a green purchasing management model. (7) In Level II, the implementation of the strategy for the change of raw materials and / or supplies, green purchases was carried out.	YES
	Creation of environmental performance indicators of products and / or analysis of their life cycle	There is construction and implementation of ecoindicators for decision making in the environmental management of the organization, in Level II of the Business Environmental Management Program.	YES
Mercados Verdes	Inclusion of the theme of Green Markets in the terms of reference of Phase V of ACERCAR	There was no inclusion of Green Markets in the terms of reference of Phase V of ACERCAR.	NO
	Training of the business sector in life cycle analysis of products	They are not established as such in the different levels of the BEMG (2); however, if they are present in Level II in the field of eco-indicators, in Level IV in the training that takes place in the life cycle, and an evident sample corresponds to the creation of the Eco-Directorate (8).	YES

Source: self made

Regarding the Sustainable Consumption Education Program, the Environmentally Responsible Procurement Manual was presented as an advance. Although this 2011 Handbook is an approximation to the concept and did not primarily address a theoretical approach, it was the SDA's first guideline on the subject and the pillar for the development of the current "Guide for the Implementation of a Management Model" of Green Purchases "(7), of the year 2013. It is considered that the Policy raised a broad indicator because, finally, the goal is to establish management strategies that promote Sustainable Consumption; however, for the purposes of this

work, the formulation of the mentioned guide is considered as a result of this program.

Regarding the Green Markets Program, it should be mentioned that the creation of the Ecodirectory (8) is an approach to the recognition of the Green Markets Sector; However, it is important to bear in mind that the economic activities of the Eco-Directorate are limited and each company as a requirement must belong to one of the economic activities prioritized to belong to it, which leads to the segregation of companies into 14 economic activities that have not been included Regarding the actions undertaken by the MADS, the information given in Table 4 can be indicated.

Table 4. *Diagnosis of compliance with prioritized activities by the MADS.*

Program	Priority activity, 2004 Action Plan	Observations	Fulfillment
Education in Sustainable Consumption	Business ecological literacy within the framework of the Microenterprise Environmental Education of Cleaner Production Policy	Development of 76 sectoral environmental guides. Execution of the Soy Ecolombiano program, which shows the Colombian population in general, a culture related to Production and Sustainable Consumption under a Life Cycle approach. Creation of the Colombian Environmental Seal (9), the Sectoral Environmental Agenda, the start-up of the Green and Sustainable Business Office, the Green and Sustainable Business Strategy. Bioexpo was created, the National Ecotiquement Program was developed and, later, the formulation of guidelines for Sustainable Public Procurement.	YES
	Technical assistance in companies for the identification of clean technologies, as established in the Cleaner Production Policy of 1997 (5)	Participation in the creation of the Cleaner National Production Center, and creation of Green Market promotion windows	YES
Mercados Verdes	Coordination with the National Green Markets Strategic Plan (3)	Completion of the Green Companies Support Guide in 2001 (10), and subscription of 67 Cleaner Production Agreements.	YES

Fuente: Elaboración propia.

It is important to recognize the efforts that have been made since the MADS, although it is not the object of the present study to evaluate the scope of each of them, if one knows the interrelation of these with the Programs of Education in Sustainable Consumption and Green Markets, mentioning and highlighting that there have been a lot of actions that have been carried out in relation to these issues, with direct relation to the actions that from the District Policy of Sustainable Production must be carried out with those given in the national framework in the National Policy of Production and Consumption Sustainable.

3.2 Phase II: Measuring the scope and perception of companies in the Programs of Education in Sustainable Consumption and Green Markets, according to the priority activities proposed in the 2004 Action Plan

In general terms, and after the application of surveys to the companies linked to the BEMG Program (2) of the SDA, the results listed below were evidenced; on the other hand, the specific advances of these companies, in relation to the Programs of Education in Sustainable Consumption and Green Markets, are presented in Table 5.

Table 5. Advance and / or perception of the companies belonging to the BEMG Program, in relation to the programs under study.

Program under study	
Education in Sustainable Consumption	Green Markets
It is one of the reasons with less importance for which companies are linked to the BEMG Program (2).	Companies do not have environmental performance indicators for products; However, if there is an interest in having them.
Despite the above, they consider that their products would have preference in the market, because they include Sustainable Consumption actions, which may indicate that the link to the BEMG Program (2) is more related to the search for knowledge of environmental best practices and of the improvement of processes.	The companies do not carry out Life Cycle analysis of products but they are interested in deepening their knowledge, although this does not constitute the reason to belong to the BEMG Program (2). The foregoing shows that the perception by which companies are linked to the BEMG Program may change during their participation in it.

Source: Own elaboration, based on the results of the internal surveys made to the companies belonging to Level I and II of the BEMG Program.

The greatest linkage is carried out by companies belonging to the industrial sector, which indicates that this is the sector with the greatest interest in environmental regulatory compliance and improvement in terms of environmental management.

The greatest environmental impacts correspond to those associated with the generation of solid waste and hazardous solid waste.

Despite being linked to the BEMG Program (2), there is a lack of knowledge of the Sustainable Production Policy of the Capital District.

In general, companies in the industrial sector, in relation to those of other economic sectors, have greater acceptance of the actions framed in Education in Sustainable Consumption and Green Markets, taking into account the variables of environmental performance indicators of products and life cycle analysis.

On the other hand, companies in the service sector do not perform environmental product performance indicators and life cycle analysis, although their perception of the preference to include actions related to sustainable consumption can be seen as an opportunity for improvement that captures their attention and interest.

Regarding the companies external to the BEMG Program (2), the general results found are summa-

rized below; the specific advances of these companies in each program were identified in Table 6.

Table 6. Advance and / or perception of the companies that do not belong to the BEMG Program, in relation to the programs under study.

Programs under study	
Education in Sustainable Consumption	Green Markets
The companies would implement, mainly, training on Sustainable Consumption.	The companies would develop and implement a Manual of Sustainable Purchases or Green Purchases.
They consider that including actions on Sustainable Consumption does not generate preference for their products in the market.	They do not have indicators of environmental performance
Despite this, the companies would implement actions on Sustainable Consumption.	It is not one of the criteria for the selection of suppliers those that are friendly to the environment.
The actions framed in the Sustainable Consumption, in his opinion, do not increase the final price of their products.	

Source: Own elaboration, based on the results of the surveys made to sample of companies that do not belong to the BEMG Program.

Companies have a high level of rejection of the presentation of the survey and disinterest in environmental issues.

Most of the companies surveyed correspond to the Services Sector.

Companies recognize the generation of solid waste and high energy consumption as the aspects with the greatest environmental impact.

There is total ignorance of the BEMG Program (2).

Companies, for the most part, do not have an Environmental Management Department.

Independent of economic, industrial or service activity, companies outside the BEMG Program (2) do not have acceptance for the actions framed

in the Education in Sustainable Consumption and the Green Markets.

On the other hand, most of the companies are not willing to develop activities that involve high formality; In turn, the perception expressed on the image of the SDA, in its majority, is negative.

3.3 Phase III: Formulation of proposals and recommendations that allow contributing to the improvement of the programs

In order to contribute to the improvement of the programs under study, three proposals were formulated for the Education in Sustainable Consumption Program, and four for the Green Markets Program. These proposals are presented in Table 7.

Table 7. *Proposals aimed at improving the programs under study.*

Program	Proposal	Objective
Education in Sustainable Consumption	Training in Sustainable Consumption for the business sector	Train the business sector in the use of fewer natural resources and toxic materials, as well as in actions that contribute to the reduction of emissions of waste and pollutants during the life cycle of the products.
	Campaign to the consumer to choose products with better environmental results	Provide tools that help the consumer to choose products whose production chain has ideal environmental standards, through business promotion
	Program aimed at suppliers	Promote environmental development through stimulation in innovation, and improve the competence of the suppliers of the business sector.
	GHG reduction and capture program	Promote the reduction and capture of greenhouse gases to the business sector allowing the obtainment of tax and economic benefits.
Green Markets	Business stimulation for the use of natural resources and biodiversity	Encourage the Bogota business sector to make the best use of natural resources and biodiversity.
	Category of environmental recognition for industrial eco-products	Recognize companies that develop industrial ecoproducts, providing them with tax and economic benefits.
	Actions aimed at promoting environmental services	Promote the following environmental services: integral management of solid waste, infrastructure projects for the treatment of discharges and emissions, and ecotourism for Bogotá.

Source: self made.

4. Conclusions

It was identified that the Sustainable Consumption Education Program established in the 2004 Action Plan of the Sustainable Production Policy for the Capital District has compliance from the prioritized activity called establishing action strategies to promote sustainable consumption, through the development of the Green Shopping Guide, by the SDA (6).

It was determined that the activities prioritized in the Plan of Action 2004 for the Green Markets Program nominated “Creation of indicators of environmental performance of products and / or analysis of their life cycle”, and “Training of the business sector in analysis of life cycle of the products “, if they are met through the establishment of ecoindicators in Level II and the creation of the Ecodirectory (8), respectively, actions developed by the SDA. Regarding compliance with the 2004 Plan of Action for the Green Market Program called Inclusion of the Green Markets theme in the terms of reference of Phase V of Acercar, it has no compliance.

It was established that the scope of the Business Ecological Literacy activity within the framework of the Microenterprise Environmental Education of the Cleaner Production Policy, the MADS complied with it through the development of 76 Sectoral Environmental Guidelines, the execution of the Soy Ecolombiano program , the creation of the Colombian Environmental Seal (9) as well as the Sectoral Environmental Agenda, the start-up of the Green and Sustainable Business Office, the Green and Sustainable Business Strategy, the development of Bioexpo, the development of the National Ecotiquetado and, subsequently, the implementation of the Sustainable Public Procurement Program.

It was indicated that the activity Technical assistance in companies (ACERCAR) carried out for the identification of feasible alternatives in the access to clean technologies, as established in the Cleaner Production Policy of 1997 of responsibility of the MADS, has compliance with the participation in the creation of the National Center for Cleaner Production and the creation of windows promoting Green Markets.

It was recognized that the business sector of the BEMG Program (2) belonging to levels I and II consider Education in Sustainable Consumption as one of the reasons with less importance for which they are part of the BEMG program. Despite what has been said, they say that their products would have preference in the market for including Sustainable Consumption actions, which may indicate that, despite knowing the benefits of implementing actions framed in Sustainable Consumption, the link to the BEMG Program (2) does not establish knowledge of actions in said program as one of its priorities.

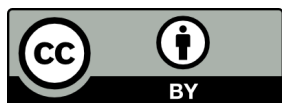
In general, it was evidenced that the companies of the industrial sector belonging to the BEMG Program (2), levels I and II, have greater acceptance to the actions framed in the Education in Sustainable Consumption and the Green Markets, taking into account the variables of the indicators of environmental performance of products, analysis of the life cycle, perception and on the preference to include actions related to Sustainable Consumption that companies outside the Program. These companies stated that they would develop and implement a Manual for Sustainable Purchases or Green Purchases even though, at present, one of the criteria for the selection of suppliers is not one that is friendly to the environment; In turn, these companies do not have environmental performance indicators.

It was determined that the contents established in the Programs of Education in Sustainable Consumption and Green Markets fall short in front of the capital needs that are framed in them, for which the formulation of proposals and recommendations understood as opportunities was made in the present document. of improvement for the Sustainable Production Policy of the Capital District.

5. References

1. Technical administrative department of the environment - DAMA. Sustainable Production Policy for the Capital District. Departamento técnico Administrativo del Medio Ambiente – DAMA: Bogotá D.C., Colombia; 2003.

2. District Environment Secretary. Business Environmental Management Program. Secretaría Distrital de Ambiente: Bogotá, Colombia; 2013.
3. Ministry of the environment, housing, and territorial development. National Strategic Plan of Green Markets. Ministerio de Ambiente, Vivienda y Desarrollo Territorial: Bogotá D.C., Colombia; 2002.
4. Ministry of environment, housing and territorial development. National Policy on Production and Sustainable Consumption. Ministerio de Ambiente, Vivienda y Desarrollo Territorial: Bogotá D.C., Colombia; 2010.
5. Ministry of environment, housing and territorial development. National Cleaner Production Policy; Ministerio de Ambiente, Vivienda y Desarrollo Territorial: Bogotá D.C., Colombia; 1997.
6. Ministry of environment and sustainable development. Advances implementation Sustainable Production Policy, Decree 482 of 2003. Ministerio de Ambiente y Desarrollo Sostenible: Bogotá D.C., Colombia; 2009.
7. Ministry of environment and sustainable development. Guide for the implementation of a green purchasing management model [Internet]. 2014. [cited June 14, 2014]. Available in: <http://www.ambientebogota.gov.co/web/publicaciones-sda/guia-de-compras-verdes>.
8. District secretary of the environment. Corporate Environmental Management Program. Eco-directory [Internet]. 2014. [cited June 16, 2014]. Available in: <http://ambientebogota.gov.co/es/web/BEMG/ecodirectorio-empresarial>
9. Ministry of environment and sustainable development. Help of Memory Colombian Environmental Stamp. Ministerio de Ambiente y Desarrollo Sostenible: Bogotá D.C., Colombia; 2013.
10. Ministry of environment and sustainable development. Guide to support green companies. Ministerio de Ambiente y Desarrollo Sostenible: Bogotá D.C., Colombia; 2011.



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