

## Diagnóstico de los Niveles I: Acercar y II: Promoción de la producción y el consumo sostenible, del Programa de Gestión Ambiental Empresarial en Bogotá D.C.

ENVIRONMENTAL ENGINEERING

### Diagnosis of level I: “ACERCAR” and II: Promotion of sustainable production and consumption of Business Environmental Management Program in Bogotá D.C.

María D. Zárate\*, Diana R. Zabala\*, Martha I. Mejía\*§

*\*Proyecto Curricular Ingeniería Ambiental, Facultad de Medio Ambiente y Recursos Naturales, Universidad Distrital Francisco José de Caldas. Bogotá, Colombia.  
mzarateabril@gmail.com, dianarabala@gmail.com, §mimejiad@gmail.com*

(Recibido: Agosto 14 de 2015 - Aceptado: Mayo 05 de 2016)

#### Resumen

La evaluación y la retroalimentación son fundamentales en todos los procesos de gestión, aún más cuando están dirigidos a orientar actuaciones a nivel de un ente territorial, especialmente tan complejo como lo es un Distrito Capital. El presente documento expone los principales hallazgos del diagnóstico que se realizó en los niveles I y II del Programa de Gestión Ambiental Empresarial (GAE) en la ciudad de Bogotá. Para su desarrollo, se consultaron los informes de gestión generados por la Secretaría Distrital de Ambiente (SDA) y se evaluaron cuantitativa y cualitativamente los planteamientos de las acciones consideradas en los niveles I y II. Por otra parte, se formularon y aplicaron encuestas tanto a empresas participantes como empresas externas, las primeras, en espacios propios del Programa GAE, facilitados por la SDA y las segundas a través de visitas, llamadas y correos electrónicos. El análisis y procesamiento de estos datos permitió establecer el impacto que han tenido los niveles I y II del Programa GAE en la percepción, el apoyo y la gestión de la Producción Más Limpia (PML) y Consumo Sostenible (CS) en las empresas con sede en Bogotá, Distrito Capital. Finalmente, basado en lo anterior, así como en consultas en entes externos, se formularon las recomendaciones pertinentes para la planeación y la ejecución con el fin de contribuir a la mejora continua en el fomento de la PML y CS en el sector productivo.

**Palabras clave:** *Consumo sostenible, producción más limpia, producción sostenible, programa de gestión ambiental empresarial, sector productivo.*

#### Abstract

Evaluation and feedback are essential in all management processes, especially when actions are aimed at target level of a local authority, especially as complex as a capital district. This document presents the main findings of the diagnosis that was made in Levels I and II of the Environmental Business Management Program (GAE by its acronym in spanish) in Bogota. For its development, management reports generated by the Secretaría Distrital de Ambiente (SDA) were consulted, and the approach of the actions in levels I and II quantitatively and qualitatively were evaluated. On the other hand, surveys were formulated and applied to both participating and external companies, the first ones, in spaces of the GAE Program, provided by the SDA, and the second through visits, phone calls and electronic mails. The analysis and processing of these data allowed us to establish the impact of levels I and II of the GAE Program on the perception, support and management of Cleaner Production (CP) and Sustainable Consumption (SC) in companies grounded in Bogota, the Capital District. Finally, based on the above, as well as in consultations with external entities, the recommendations for the planning and execution in order to contribute to the continuous improvement in the promotion of CP and SC in the productive sector were made.

**Keywords:** *Cleaner production, environmental business management program, productive sector, sustainable consumption, sustainable production.*

## 1. Introduction

To a national level, the production and the sustainable consumption are strategies with great relevance on the environmental management. This is reflected with the emission of the National Policy of Production and Sustainable Consumption, which has as aim “To orientate the change of production and consumption patterns from Colombian society towards to an environmental sustainability, contributing to the competitiveness of companies and well-being of the population.” (MAVDT, 2010).

In that sense, Bogota is transcendental because is considered the main business center of country, is characterized by the predominance of services sector activities with 46%, trade with 16% and industry with 14% (SDP, 2010); on the other hand, concentrates the 42,8% of national total of industrial establishments in 2011 (DANE, 2013). Likewise, the Bogota Commerce Chamber (CCB) reports a total from 402.546 registered and renewed companies by October 2015 (CCB, 2015). This grants validity to the approach of Environment Administrative Department (DAMA) which establishes that it is fundamental to develop strategies at the institutional level, tending to articulate the productive activities with the city priorities (Mejia, 2012). Those, are currently oriented by the District Decree 190 of 2004, compiled from the Decrees 619 of 2000 and 469 of 2003.

This scenario reflects the need for clear paths and that framework the actions undertaken by the District, taking in count their specificities, in themes like the Production and Sustainable Consumption.

The current study is part of the investigation project “Evaluation of Cleaner Production Strategy Promotion from Sustainable Production Policy for the District”, developed by the authors and from which emerge two products. On first place, the evaluation of Cleaner Production strategy Promotion and, in second place, the diagnosis of activities related to that strategy, currently addressed from levels I and II of GAE Program, thematic exposed in this article.

The aim of study is to value the performance and relevance of the proposed activities in levels I and II from GAE Program, because in spite of programs and projects are governed by national policies, should be established if there are parameters that guarantee the aptitude of those for the particular conditions of Capital City, as well as the agreement with other projects and programs related to Production an Sustainable Consumption in the District.

Taking into account the above, were diagnosed levels I and II from the GAE Program with two purposes: the first, update the programs proposed in the Promotion of Cleaner Production strategy, considering the diverse an substantial changes that Bogota has undergone along a decade, including tools for diffusion of information, the technological level of industries, among others; the second, to define the present arrangements in the district policy so that it serves as instrument to coordinate different actions related to production and sustainable consumption en the city.

## 2. Methodology

For the present study, a methodology suggested by the authors was applied, which considered three phases which are composed, at the same time, for stages that address complementary activities, shown on the figure 1 and described below:

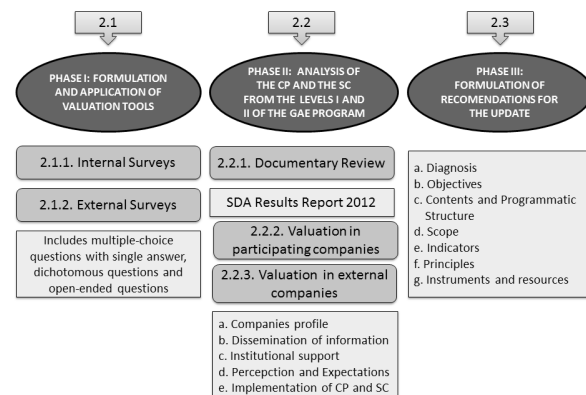


Figure 1. Methodological procedure.  
Source: Authors.

## 2.1 Phase I: Formulation and application of valuation tools

### 2.1.1 Formulation y application of internal surveys

During the development of this phase the information was obtained from the formulation and application of checklists survey type in companies belonging to Level I: ACERCAR and Level II: PSPandC from GAE Program, evaluating the perception of these companies as to the effectiveness of promotional strategies, approach and communication from public and private institutions on Cleaner Production theme, the scope of the training work, information and support provided by GAE by the SDA, also the level of knowledge of the proposal, actions, general structure and the GAE Program implementation, and, last, the expectations that are generated from the linking of the companies to the programs of support to the environmental protection, like the GAE, that provide the institutions or agency of surveillance an environmental control, such as SDA.

It was included questions with de following characteristics: firstly, multiple choices with single answer, such as: Do you consider that business care provided by the SDA to the particular needs and concerns of its economic activities has been: Null, Low, Medium, High. Secondly, dichotomous questions (yes or no answer) such as have you had access to publications or guides referring to CP or CS, and lastly, open questions like what aspects would you improve for the moment in the process of Level? Later, through a statistical and computer treatment with the help of application Excel, the information was organized and quantified.

### 2.1.2 Formulation y application of external surveys

For the evaluation of the scope from current activities related to CP undertaken by SDA, information was obtained through stratified random sampling, weighted by economic sectors, in District companies that are not linked to the GAE Program (external companies). The survey type checklist that

were applied to external companies, evaluated the effectiveness perception of promotion strategies, approach and communication from different public and private institutions on CP themes, besides the knowledge level of proposal, actions, general structure an implementations of GAE Program. Finally, the perception of the image of environmental control entities as the SDA was valued.

For the application of external surveys, the CCB provided the report about the total number of companies in the city by the year 2014 and its distribution according to the International Standard Industrial Classification (ISIC). Based on this number and considering the high probability of surveys without answer, the authors decided work with an initial number of 500 companies. The Equation 1 was used to weight according to ISIC (4 Revision from DANE) the total number of companies by economic sector, so that each sector was representative in the sample. The companies in each sector were selected randomly by CCB.

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

Where:

$N_h$  is the number of companies requested by Economic Sector (Division by ISIC)

$TC_h$  is the total number of companies in Bogotá from de ISIC

TB is the total number of companies of Bogotá.

Equations 2, 3 and 4 were applied to determinate de minimal number of resolved surveys required by each ISIC sector, guaranteeing the representativeness of each one; in sum, the required sample is at least 89 completed surveys, with and confidence interval of 91%, which is equivalent to an error rate of 0.09 and z of 1.69.

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

Being

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

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

Where:

$n$ , sample sized to be surveyed

$N_h$ , companies total number from economic sector

$N$ , total population size

$Ph = 0,5$

$Qh = 0,5$

$z$ , confidence level

$e$ , error rate

Subsequently, it was carried out the fulfillment of the checklist, by electronic mail and by telephone, taking into account the convenience of companies and in order to obtain the as many responses as possible. In the same way as in the first stage of present phase, the information compiled was organized and quantified with the help of Excel tool.

## 2.2 Phase II: Analysis of the CP and the SC from the Levels I and II of the GAE Program

### 2.2.1 Documentary review on the GAE Program

It was developed the reading and analysis of the documents related of the GAE Program, provided by the SDA, specifically, the results reports for the year 2012 of the Levels I: ACERCAR y II: PSPandC and CS; also, it was made the review of GAE Program website. From these, the structure of each level was determined and a synthesis of performance results for the year 2012 was presented. Observations were made about the pertinence of the lines of actions carried out, as well as the impacts that were evidenced on the environmental management from participating companies.

### 2.2.2 Valuation of results of levels I and II in participating companies

The information obtained in the 2.1.1 stage was analyzed, classifying it into five themes as illustrated on Figure 1, taking into account that the linkage to the GAE, implies a greater appropriation of sustainability concepts: Profile of companies linked to GAE in the Level I and II, Dissemination of GAE Program information, institutional support, Perception and expectations of participation on GAE Program, and CP and SC Actions Implementation

### 2.2.3 Diagnosis of CP Perception in companies with operation in the District

The information obtained in 2.1.2 stage was analyzed, taking into account that, being a representative sample, it shows a panorama of district productive sector.

## 2.3 Phase III: Recommendations for the update

From the analysis of the results and the diagnosis obtained in the development of the previous phrases, it were identified recommendations for the restructuration and execution of the Levels I and II from GAE Program, which are directly related quit the promotion and implementation from CP and SC.

## 3. Results and results analysis

### 3.1. Application of valuation tools

#### 3.1.1. Application of internal surveys

In the Level I: ACERCAR, were surveyed 134 companies of a total of 226 registered. On the other hand, in Level II: PSPandC were surveyed 89 companies of 100.

#### 3.1.2. Application of external surveys

In regard to the application of survey in companies that constitute the district sample, was evidenced the low interest of them at the moment of participating in the research exercise because, of initial 500

companies in the CCB database, approximately 80% did not respond. The final sample obtained is 92 companies, distributed proportionally in the sectors described by ISIC code. As the minimums by sector were met and that exceeds the minimum sample of 89 companies, the study guarantees a confident level of, at least, 91% with an error of no more than 9%.

Some of the reasons for this lack of interest may be relate with the prevention of companies to provide internal information, the apprehension before the academy or the topics related to the control organisms, And apathy related to environmental topics; Thus, through telephone interviews, the mails exchanged and the visits made to the companies, it was possible to established that there is a lack of interest of micro and small companies, as well as a large part of the services sector, because they consider that CP is not applicable in their organizations

The results of the processing and analysis to which the collected information was submitted will be presented on the item 3.2.3 CP Perception in companies with operations in the District.

### 3.2 Analysis of the actual activities related with CP and SC

#### 3.2.1 Documentary review of GAE Program

##### 3.2.1.1 Characterization of Levels I and II of the GAE Program

*Level I: ACERCAR.* This level points to the normative compliance of companies, which is fundamental for the CP Promotion, because it is the first step towards the development of good business practices. The management report for the third cycle 2012 for level I, elaborated by the SDA, describes the operation of the same, in convocation activities, registration, technical visits, training development, evaluation of program and certification (Masso & Suarez, 2012).

*Level II: PSPandC.* At first, propose as aim to promote the development of Production and Sustainable Consumption projects. Defined in the revision of the GAE structure, from the 2013 the Level II is denominated Sustainable Production and its focus is the accompaniment in the measurement, interpretation and generation of actions in form of project or environmental program (Cáceres & Morales, 2012; SDA, 2014).

#### 3.2.1.1 Management and Impact of the Levels I y II of the GAE Program

##### 3.2.1.1.1 Management results

Table 1 summarizes the management results for the 2012 year of Levels I y II of GAE Program, which provide an overview of the effectiveness and the points for improvement in the interventions defined by the SDA.

*Table 1. Synthesis results of Management of levels I and II of the GAE Program, year 2012.*

<b>Third Cycle</b> <b>Level I: Acercar.</b>	Specialized call 31.9% of the total participants Total of participating companies: 360 companies Division of the Participating sectors: 40 commerce, 195 manufacturing and 125 services Average attendance at training: 79% Certification Percentage: 43.3%
Lines of Action	Results
<b>Training Cycles</b>	Total of participating companies: 410 Companies that completed the cycle actively: 347 (84.6%) Certified Companies in level II: 188 (45.8%) Companies that postponed the cycle: 208 (6.8%) Products: Guide for the generation of strategies for efficient use of water and energy Guide to efficient waste management.



\*Continued of Table 1

<b>Production y Sustainable Consumption</b>	<p>PROJECTS                  Higher participation: commerce, metalworking, chemicals and health.                  Lower participation: tanneries, lumber, furniture and hydrocarbons                  Localities with more participation: Puente Aranda, Fontibón , Kennedy                  Localities with less participación: Tunjuelito, Ciudad Bolívar , Suba</p>
<b>Interinstitutional Agreements</b>	<p>BORSI – Agreement 004 of 2011                  Approved advertisement requests: 124                  Advertisement requests - offer: 115 (93%)                  Advertisement requests - demand: 9 (7%)                  Total Trading Requests: 385                  Trading Requests - offer: 266 (69.1%)                  Trading Requests - demand: 119 (30.9%)</p>

Source: Authors based on Consolidated Report of the levels Acercar y PSPandC of 2012. 2014.

*Impact Indicators:* there are not Impact Indicators applicable to Level I. The existing ones are based mainly on Eco-indicators provided by participant companies from Level II as one of the established activities for which advice is provided. Is indicated for 2012, a positive behavior compared to 2011 in water saving, with a 27.707m<sup>3</sup> total, and energy, with 7.827.795kWh total. For dangerous residues, there are better results for 2011 than in 2012 (SDA, 2012). Punctual reports of executed projects are successful cases, which constitute a positive and demonstrable impact of the actions proposed in Level II.

### 3.2.1.1.2 Success

*Announcement specialized in Level I:* It is strategic in sectors previously identified as strategic, Starting from a geographic and economic characterization. It is applicable to critical sectors and localities that show low participation, such as Tunjuelito.

*Expansion of the spectrum of action of Level II:* encompassing, besides the promotion, the implementation and the follow up to CP actions. It constitutes a more integral advice.

*Use of Eco-indicators:* the calculation and report of eco-indicators is useful for the companies themselves and, for the level, is one of the indicators that allows value its impact, and generate an effective feedback on actions, projects and publications.

### 3.2.1.1.3 Limitations

*Fluctuations in the technical staff of the level:* It implies an inconvenient in actions continuity, the internal information management and, therefore, the fulfillment of objectives.

*Information management:* Scattered management of websites without continuity of the same, which creates confusion in the users and weakens the media plan. On the other hand, there are plentiful publications of good quality, but there are not define clear and efficient mechanisms for their diffusion.

*Business performance:* The certification numbers for Levels I and II in 2012 are described as moderate (43.3% and 45.8%, respectively), because less than half of the companies achieve the requirements for advancement to the next level. Therefore, it is necessary to apply a feedback process that allows the optimization of resources and activities by SDA, as well as a better performance and the effective appropriation of CP and SC by participating organizations, increasing the proportion of certified companies.

*Scope of the approaches:* Level II should consider again in a whole CP and SC, following the national focus and being consequent with the activities proposed by SDA, where it works with both manufacturing, commercial and service sectors.

#### 3.2.1.1.4 Absence

*Medium and Long Term Foresight:* For the 2014 year, the SDA did not have documents that established planning in the time, as internal, referring to the allocation of logistical and human resources, as external, taking into account the alliances with other institutions with similar purposes in CP and SC. This is reflected in the administrative complexity manifested on management reports.

*Goals, indicators and follow up plan:* There are not goals and indicators formulated, nor with an evaluation system and monitoring previously established. These elements are required to determine the real impact that participation at the level has on business practices; likewise, allow the prioritization of topics and activities that show greater results, as well as to discard those that are not optimal in the fulfillment of the objectives, looking for the efficiency of the resources and the efficacy of the approaches executed

#### 3.2.1.1.5 Budget

Although, from the documents of the Finance Secretary and the document *Evaluación de los resultados del Programa "Ventanilla Acercar"* by DAMA (Calderón, 2005), information from this window is available, it does not exist specific information for the Levels I and II from GAE Program, which has been in operation since 2010. The SDA does not provide budget information for any of the two levels considered; likewise, the management reports do not include data or indicators of budgetary efficiency. This fact implies that internally, these indicators have not been taken into account for the feedback processes which limits the determination of efficiency in terms of cost - benefit.

#### 3.2.2 Evaluation of GAE Program results in participating companies

The economic activities of companies that are linked to the GAE Program in the Level I: ACERCAR for the year 2014 are, mostly, the manufacturing and services sector, with a percentage of 43.3% and 44%,

respectively. For its part, the economic activities of companies that are in Level II: PSPandC for the 2014 are, mostly, from these same sectors, with a percentage of 51.7% and 40.4%, respectively.

This allows them to be identified as strategic sectors for promotion and implementation of CP and SC, under the criterion of interest on environmental management, being also fundamental in productive chains for the capacity of association and relevant for the environmental aspects and impacts generated in the development of their activities. Also, it is established the need to encourage the participation of the commercial sector in the Program, because its presence in the District is significant; however, it is not reflected in its linkage to the GAE Program.

The main environmental impacts generated by the companies linked to GAE in the Level I: ACERCAR, are the high generation of solid waste and hazardous solid waste with a percentage of 25.6% and 25.1%, respectively. This trend is repeated in the companies linked to the GAE Program in Level II: PSPandC, presenting the high generation of solid waste and hazardous solid waste by 41.4% and 31.9%, respectively.

#### 3.2.3 Perception of CP in companies operating in the District

The main environmental impacts generated by external companies, are the high amount of solid waste and high energy consumption, with a percentage of 37.9% and 26.1% respectively. This trend is consistent with Levels I and II of the GAE, where the main impacts reported are high amounts of waste from raw materials used in industrial activities and the lack of recyclable waste management as paper in services sector. In this regard, it is pertinent to articulate the action lines, with initiatives from public programs like *Basura Cero*, proposed in the Government Plan *Bogota Humana*. On the other side, to promote programs that allows the decrease of the use of paper in the service sector and institutional, as well as the efficient use of raw materials in manufacturing sector.

The majority of organizations consulted do not have a Management Department (or similar figure) registered with the SDA representing a percentage of 50.4%, followed by the companies by that do have this Department in order to reduce environmental aspects and impacts, comply with environmental regulations and generate sustainable consumption, with values of 9.5%, 8.7%, and 8% respectively.

The Figure 1 presents a parallel of the main results obtained in relation to the perception of CP and environmental management from companies participating on GAE Program, as well as the external companies, showing the panorama of Production and Sustainable Consumption in the companies from Bogota D.C., the perspective that should be addressed by the SDA from the GAE Program in terms of CP and SC.

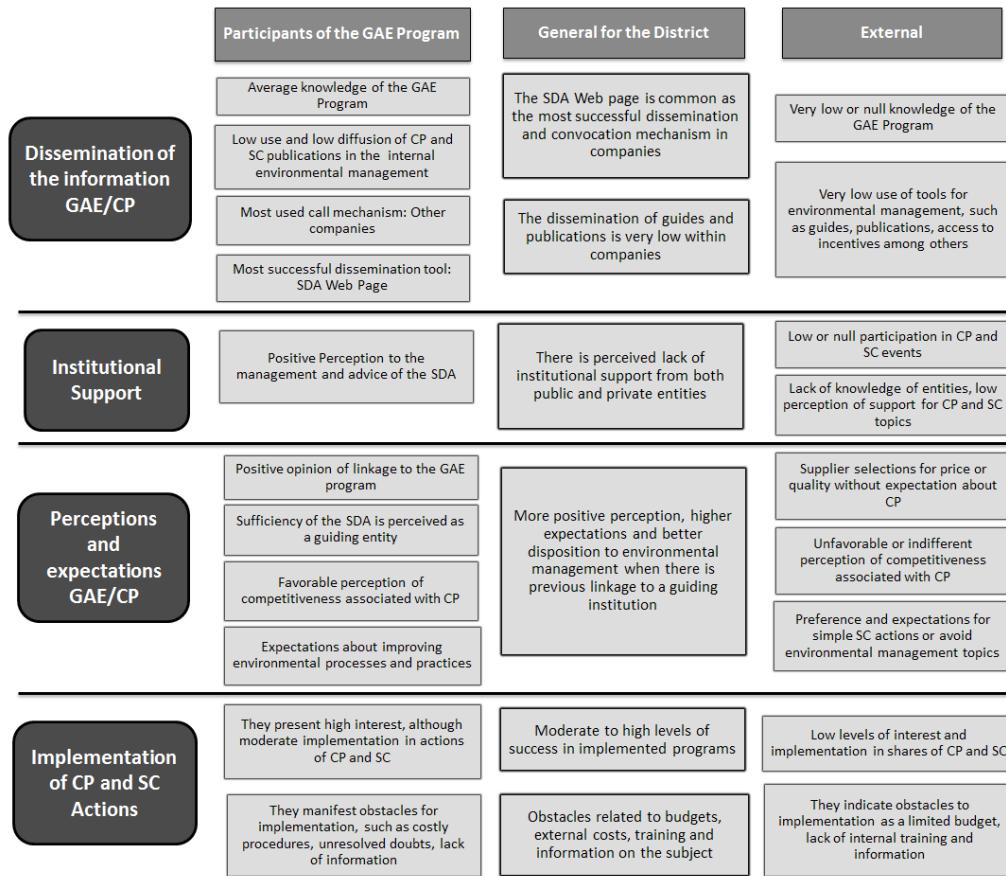


Figure 2. Main results of CP perception in companies belonging to the GAE Program and external companies. Source: Authors.

### 3.3 Recommendations for update

With the development of described activities, important elements were identified that should be considered in the reformulation and implementation of actions aimed to promote the SC and the SC in the District, seeking the update of the District

Sustainable Production Policy. The following is a summary of recommendations classified by theme.

#### 3.3.1 Diagnosis

To design diagnostic strategies (arrangements with institutions and databases of periodical registration)



in the short and medium term (1 and 5 years) about the companies participating in the GAE Program, carrying out the recognition of difficulties in the procedures and processes proper to the actions defined in the same program. In this way, from the feedback of the activities already carried out, times get readjust and optimized, resources and instruments, making possible a better environmental performance in organizations, especially in terms from CP and SC.

### **3.3.2 Objectives**

#### **3.3.2.1 General Objective**

The District should not be limited to programmatic execution, but must clearly manifest a leadership approach to environmental management processes within a global cooperation framework, so that it articulates to the vision that the Land Planning Plan (LPP) for the District proposes, compiled in District Decree 190 from 2004, in force today.

#### **3.3.2.2 Specific Objectives**

The specific objectives related to the Promotion and Implementation of Cleaner Production should focus on encouraging the interest and appropriation of Sustainable Production, through the dimensioning of the benefits that can be obtained with an effective environmental management and the construction of a concept of competitiveness linked to good environmental performance.

### **3.3.3 Contents and programmatic structure**

It is recommended to continue the approach that Level II: PSP and C of the GAE Program currently manages, that is, instead of limiting the action lines to the Promotion, to generate effective support mechanisms for the implementation of Production and Sustainable Consumption actions in companies, as mentioned, it is considered appropriate the approach to lines of action between the CP and the CS.

#### **3.3.4 Scope**

The scope currently addressed by the GAE, is centered in Bogota city and specifically limited to

the urban perimeter. The activities at the city level should have a regional approach to guarantee an adequate articulation within the framework of capital region paradigm established in the LPP 2013. For this, a previous work of institutional coordination must be carried out, with entities such as the Corporación Autónoma Regional (CAR), the Agriculture Ministry and Rural Development, the Ministry of Environment and Sustainable Development, among others.

#### **3.3.5 Indicators**

The development of eco-indicators within companies as has been done in level II, is very useful for the organizations because allows to establish the practical consequences of the implementations of the actions in CP. Also, they must be used by SDA, for the establishment of goals and the quantification of real impacts of environmental efforts. In this same way, the standardization of eco-indicators by productive sectors is proposed.

#### **3.3.6 Principles**

*Transparency:* The communication of information on advances and developments related to the CP and SC must be truthful and verifiable by the interested parts.

*Participation:* The participation and networking of the different private, public and civil society actors are the basis for the generation of a culture of sustainable production and consumption.

#### **3.3.7 Instruments y resources**

##### **3.3.7.1 Publications**

It is proposed to make an inventory of publications related to CP and SC topics, both those that have been realized from SDA, and from external entities. In this way, to consolidate a database accessible to the public, where the title can be consulted, a summary of the contents, and the way of accessing them, either physical or digital.

It is proposed the construction of a virtual tool for the consultation of digital publications generated

by the SDA. Also, to establish a platform with links to the websites of the different specialized centers in CP, as well as the Latin American Network of CP, among others.

On the other hand, it is recommended to design and implement a high-impact media plan, which allows the broadcast of both the publications, and the programs and projects of the SDA and others entities interested on promotion and execution of CP and SC actions.

In this sense, it is suggested the use of new alternatives such as social media, or agreements with entities such as IDARTES, that allow to take advantage of spaces of massive concurrence, to raise awareness and promote the culture of sustainability. Likewise, coordination with regional or national media plans.

New publications, guides, bulletins, etc., should be developed using information appropriation strategies, because from the internal and external surveys carried out within the framework of current study, there is evidence of a great diversity in the educational level of the people in charge of environmental management.

### **3.3.7.2 Agreements**

Consider the implementation of regional CP and SC agreements, taking into account that industrial dynamics have been decentralized in the last decade. Those can provide strategic elements for the fulfillment of joint objectives, as well as experiences that give feedback to the actions of the District.

### **3.3.7.3 Economic incentives**

The economic incentives are a strategy used worldwide (including the National Policy of Production and Sustainable Consumption) for the CP promotion among companies. The management of this topic should be strengthened at the district level, from agreements with the financial sector, for example. At the international level there are examples such as the inclusion of incentives in Chile's Clean Production Policy 2010 and the National System of Incentives to the CP, Costa

Rica 2009. At the national level, there are examples of tariff incentives for saving and efficient use of water Law 373/1977, which, while related to the SC, also contribute to the CP.

## **4. Conclusions**

The current scope of the actions related to Production and Sustainable Consumption undertaken by the SDA, defined within Levels I and II of the GAE Program, is quite limited in relation to the needs and Bogota particularities that has a vast business sector. This, together with difficulties identified by the same institution, for the execution of lines of action, reveals problems in the planning and allocation of resources, both logistic and human, in the time. In this regard, is ratified the importance of updating the District Sustainable Production Policy in general, and the strategy of "Production and Sustainable Consumption" particularly; So that the inter-institutional articulation becomes feasible, and in which responsibility, budgets, resources and deadlines are defined, both internally in the SDA, and the District, and even, at the regional level for those actions that are needed under the Region - Capital paradigm.

The assessment of the impact from Levels I and II of the GAE Program reflects that, from the linking of companies to the program, presents an advance in the use of tools for environmental management; likewise, it is evident the overcoming of barriers and prejudices towards the control organisms, and a considerable improvement in the perception of how the actions of CP and SC impact competitiveness.

At the application time of the surveys to the representative sample of companies grounded in the District, it was evident the low interest and appropriation by them, of the concepts related to Production and Sustainable Consumption, especially in the services sector, and in the Classification of Micro and Small companies; for which they are presented as priority sectors for the implementation of activities of rapprochement and sensitization.

In general, the business sector of the District manifests the lack of support, promotion, approach

and / or dissemination of information of projects being promoted by both public and private organizations to accompany business management, which, taking into account the density of this sector in the District, it is of vital importance for the achievement of goals aimed at sustainable development.

The acquisition of information concerning to the productive sector from Bogotá city is very expensive, which implies an obstacle in the elaboration of general diagnoses, in the meantime, partial diagnoses, can bias program approaches, plans and projects.

## 5. References

- Alcaldía Mayor de Bogotá (2004). *Decreto 190. Por medio del cual se compilan las disposiciones contenidas en los Decretos Distritales 619 de 2000 y 469 de 2003*. Bogotá, Colombia.
- Cáceres, M. & Morales, N. (2012). *Informe Consolidado del Nivel II – Promoción para la Producción y Consumo Sostenible – PPyCS*. Programa Gestión Ambiental Empresarial. Secretaría Distrital de Ambiente, Bogotá, Colombia.
- Calderón, L. (2005). *Evaluación de los resultados del programa “Ventanilla Acercar” de DAMA*. Contraloría de Bogotá D.C., Bogotá, Colombia.
- Cámara de Comercio de Bogotá. (2015). *Boletín Nro.10 Crece el número de Empresas en Bogotá y la Región*. Bogotá, Colombia. Recuperado de: <http://www.ccb.org.co/Sala-de-prensa/Noticias-CCB/2015/Noviembre/Crece-el-numero-de-empresas-en-Bogota-y-la-region>
- Consejo Nacional de producción Limpia (2010). *Política de Producción Limpia*. Santiago de Chile, República de Chile.
- Congreso de la República de Colombia (1997). *Ley 373. Por la cual se establece el programa para el uso eficiente y ahorro del agua*. Bogotá, Colombia.
- Departamento Administrativo Nacional de Estadística DANE (2013). *Encuesta anual manufacturera*. Bogotá, Colombia.
- Masso, L. & Suarez, L. (2012). *Informe Tercer Ciclo acercar*. Programa gestión ambiental Empresarial, Secretaría Distrital de Ambiente. Bogotá Colombia.
- Mejía, M. (2012). *Propuesta de investigación, política de producción sostenible para el distrito capital*. Universidad Distrital Francisco José de Caldas, Bogotá, Colombia.
- Ministerio de Ambiente, Vivienda y Desarrollo Territorial. (2010). *Política Nacional de Producción y Consumo Sostenible*. Bogotá, Colombia.
- Secretaría Distrital de Ambiente (2014). [Sitio Web]. *Programa Gestión Ambiental Empresarial. Nivel II*. Recuperado de: <http://www.ambientebogota.gov.co/es/web/gae/operacion>.
- Secretaría Distrital de Ambiente (2012). *Consolidado informe de gestión*. Programa de gestión ambiental empresarial. Bogotá, Colombia.
- Secretaría Distrital de Planeación (2010). *Diagnóstico de la región capital. Bogotá – Cundinamarca*. Bogotá, Colombia.
- Varela I. (2009). *Sistema nacional de incentivos a la producción más limpia en Costa Rica, tecnología en marcha*. San José, República de Costa Rica.



Revista Ingeniería y Competitividad por Universidad del Valle se encuentra bajo una licencia Creative Commons Reconocimiento - Debe reconocer adecuadamente la autoría, proporcionar un enlace a la licencia e indicar si se han realizado cambios. Puede hacerlo de cualquier manera razonable, pero no de una manera que sugiera que tiene el apoyo del licenciador o lo recibe por el uso que hace.