

Environmental excellence district program assessment according to the strategy self-management promotion of the sustainable production for capital district policy

INGENIERÍA AMBIENTAL

Evaluación del programa de excelencia ambiental distrital en el marco de la estrategia fomento de la autogestión de la política de producción sostenible para el distrito capital

Angie S. Orjuela*, Oscar D. Vallejo*, Martha I. Mejía*§

**Proyecto Curricular Ingeniería Ambiental, Facultad de Medio Ambiente y Recursos Naturales, Universidad Distrital Francisco José de Caldas. Bogotá, Colombia.*

angie_sulay_@hotmail.com, davidvallejo92@hotmail.com, §marthaisabelmejiad@gmail.com

(Recibido: Agosto 14 de 2015 – Aceptado: Octubre 06 de 2016)

Abstract

This article presents the methodology and results obtained from the Environmental Excellence District Program – PREAD – assessment, which belongs to the Secretaría Distrital de Ambiente - SDA- program who is in charge to feed the District information systems, according to the active industry in Bogotá city, quantifying their environmental impacts, classifying their performances and efficiencies, determining market trends and encouraging the postulated and improvement of environmental management systems giving public acknowledgements to companies with the best environmental performances. This assessment used as a methodological basis the Strategic Environmental Assessment - EAE - tool used for the analysis of public policies which use an environmental development looking that is not in the scope of Environmental Impact Studies – EIA-, because they only analyze quantitatively aspects and environmental impacts but leave out political and administrative aspects related to the prospective analysis of public policies. Took into account the program evolution over time, considering the periods 2001-2003 and 2004-2013, deficiencies in documentation and continuous monitoring improvement and built the perception of the enterprises in the city about the program and the institutions responsible for its implementation, through a random sampling, in order to formulate tools for its improvement and updating. Finally, recommendations for postulated in all stages of the program are structured, taking into account the inter-institutional communication, the documentary record, quality control and communication protocols and interaction with the population object for the program and inclusive policies in this.

Keywords: *Environmental management systems, PPSDC, PREAD, random sampling, sustainable production.*

Resumen

El presente artículo expone la metodología y los resultados obtenidos al evaluar el Programa de Excelencia Ambiental Distrital – PREAD – programa de la Secretaría Distrital de Ambiente –SDA- que logra alimentar los sistemas de información del distrito respecto a la industria activa de la ciudad, cuantificar sus impactos ambientales, clasificar sus rendimientos y eficiencias, determinar patrones en el mercado y fomentar la aplicación y mejora de los sistemas de gestión ambiental al interior de las organizaciones, otorgando reconocimientos públicos a las empresas con mejor desempeño ambiental. Dicha evaluación utilizó como base metodológica la Evaluación Ambiental Estratégica – EAE -, herramienta utilizada para el análisis de políticas públicas que toma como eje transversal una mirada ambiental del desarrollo que no está en el alcance de los Estudios de Impacto Ambiental –EIA-, ya que sólo analizan cuantitativamente los aspectos e impactos ambientales y dejan por fuera aspectos políticos y administrativos relacionados con los análisis prospectivos propios de las políticas públicas. Se contempló la evolución del programa en el tiempo, considerando los periodos 2001 a 2003 y 2004 a 2013, se observaron carencias de documentación y seguimiento a la mejora continua y se identificó la percepción del sector empresarial de la ciudad sobre el programa y las instituciones encargadas de su ejecución, a través de un muestreo aleatorio, con el fin de construir herramientas integrales para su mejora y actualización. Finalmente, se estructuran recomendaciones para su aplicación en todas las etapas del programa, teniendo en cuenta la comunicación inter-institucional, el registro documental, control de calidad y los protocolos de comunicación e interacción con los actores objetos del programa y las políticas incluyentes de este.

Palabras clave: *Muestreo aleatorio, PPSDC, PREAD, producción sostenible, sistemas de gestión ambiental.*

1. Introduction

Taking as the starting point the United Nations Declaration on the Human Environment, in which the Principles are given to preserve and improve the human environment of the earth in the years to come, The global conventions continue to reflect the concern of governments over the deterioration of natural resources (Stockholm Declaration, 1972). In this situation, some countries decide Participate in these agreements, Colombia with an advance work on its legislation regarding the environmental theme, reflects an early political commitment. On 1997 The National Cleaner Production Policy is generated, Defined as the continuous implementation of a preventive environmental strategy and integrated in the productive processes of products and services, to reduce the relevant risks to humans and the environment (UNEP, 2006). For the year 2002, was proposed the National Plan of Green Markets, this plan Seeks stronger synergies between different society actors: Industry, government, market and civil society. In 2003, was proposed The Sustainable Production Policy for the Capital District – PPSDC- that has the object of “Improve the population life quality, the environmental environment, and business competitiveness of the city, through sustainable production programs in the productive sectors, considering the services and institutional sector of the District” (DAMA, 2003). Finally, in the year 2010 the Ministry of Environment, Housing and Territorial Development develops the National Policy of Production and Sustainable Consumption – PNPYCS- that has the objective of integrate The Cleaner Production policy and the National Green Market Plan, seeks environmental sustainability, business competitiveness and environmental well-being, seeking to change the patterns of production and consumption of Colombian society.

In 2001 the Program of Environmental Excellence - PREAD was created as one of the flagship programs of the Administrative Department of the Environment – DAMA – with the objective of collect, classify and evaluate the environmental management performance of registered companies,

providing technical support, recognizing and rewarding companies with better environmental performance.

The DAMA in 2006 was restructured with the Administrative Reform of the Capital District or agreement 257 from 2006 and also was created the Environment District Department – SDA – through the decree 561 from 2006. For this year, the first update of PREAD was made for resolution 1837 from 2006, where the program formally welcomes the PPSDC guidelines, broadens its action scope for include a greater number of companies and increases the benefits provided to those already belonging to the program.

In 2010 the SDA establishes the Corporate Environmental Management Program – GAE-, Which consists of 5 complexity levels, where the PREAD constitutes the fourth level of this, representing the efforts of the district authorities for improve the city's environmental quality and generate a greater impact on the community. Also, the last update to PREAD was made through the resolution 5999 from 2010, where its evaluation structure is modified and the Decision Board of PREAD cases is created as administrative instance of the SDA for Study, analysis, approval and resolution of the issues and program conflicts.

According to the above, the development of PREAD has occurred in the absence of an evaluation and follow-up stage, scenario that limits the harmonious articulation of PREAD with its macro policies: PNPYCS y PPSDC. Because that also there are gaps in the registration and dissemination of the achievements in its implementation and changes on the participating actors, the following investigation question is established. What aspects on the PREAD management can be strengthened within the frame of the PPSDC updating?

To answer the investigation question we took into account the methodology proposed by the Strategic Environmental Assessment – EAE - we considered qualitative aspects such as the political and administrative scenario that have a direct influence on the program and business

perception, through the postulated of surveys to companies inside and outside of the program, As well as technical and quantitative aspects related to the achievements and qualitative, indirect, cumulative and synergistic impacts generated in the development of PREAD.

2. Methodology

Four phases were developed in order to evaluate the PREAD. In the first, the level of articulation presented by the program with the PPSDC and PNPYCS was established from the analysis of its objectives. Then, With the intention of verifying the fulfillment of the goals proposed for the PREAD from the PPSDC, a documentary review was made regarding the companies linked to the program until 2004, this year was proposed by the PPSDC to verify the registrations of products and/or green services as well as reports or some experiences exchange evidences with international entities and the changes made to the postulated guidelines for the program and finally, the information was compiled in terms of budget execution. A PREAD development diagnostic was carried between the years 2001 and 2013, through a new documentary review related to the companies related to the program, the performance and management indicators, The checklists used in the different convocations and The analysis of the different administrative acts that renewed and / or updated the PREAD structure and The results reported by the different district governments through their action plans.

For the third phase, with the objective of know the perception that the companies of the city have on relation to the program, two surveys were carried: the first survey to companies located within the city's urban area that do not belong to PREAD and the second to The companies belonging to PREAD, for construct an integral perception of the PREAD and the PPSDC from that population. Because the number of companies belonging to Bogota is large, for the realization of the surveys was selected a sample, using the Stratified Random Sampling, where we took into account the size of the companies and their classification according to their activity, taking into account the International

Uniform Code – CIIU - using the equations 1 to 6 (Velasco & Pedraza, 2014) to obtain it and on which basic information was acquired for 500 companies provided by the Chamber of Commerce of Bogotá – CCB-.

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

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

$$y W_h = \frac{N_h}{N} \quad (3)$$

Where,

(n), Sample size to be surveyed

N_h, Total number of companies in the economic sector h

N, Total population size

P_h= 0,5

Q_h= 0,5

(z), confidence level

(e), error rate

$$N_h = \frac{TC_h}{TB} * 100 \quad (4)$$

Where,

N_h, Number of companies by economic sector

TC_x, Total companies in Bogotá from CIIU h

TB, Total companies in Bogotá

$$N_t = \frac{(Tt_h) * (100)}{ST_{CIIU}} \quad (5)$$

Where:

N_i, Companies percentage by Size

Tt_h, Number of companies by size h

ST_{CIIU}, Subtotal for each CIIU

$$Mt = \frac{N_h}{N_t} * 100 \quad (6)$$

Where:

Mt, Total sample including CIIU and size

N_h, Number of companies by economic sector

N_i, Companies percentage by Size

In the final phase Are taken the most important elements collected in the previous phases, for its analysis, taking into account the scheme of the matrix of Weaknesses, Opportunities, Strengths and Threats – DOFA – and as a complement were developed the Matrices: Internal Factors Evaluation Matrix – MEFI- and External Factors Evaluation Matrix – MEFE - Both internal and external factors were given a weight and a rating where the sum of the weight of all external factors did not exceed unity and the rating ranged from 1 to 4 where 4 is the best use of the strengths and opportunities and the control, minimization and prevention of threats and weaknesses. This allowed the prioritization of those aspects to be strengthened and the formulation of recommendations for PREAD updating, including evaluation and monitoring tools.

3. Results and discussion

3.1 Phase I

3.1.1 Articulation between PREAD, PPSDC y PNPycS

One of the most relevant aspects regarding the basic guidelines from the PNPycS, PPSDC and PREAD is that the first considers clean technologies as a structural axis of sustainable production and responsible consumption by the final consumer while the PPSDC and the PREAD only contemplate cleaner production with a focus on industry. The PNPycS goes a little further on the proposals related to the internalization of environmental costs while the other two promote the reduction of the externalities generated in the productive processes, but without a direct influence on the consumer's role from the price of the products. It must be taken into account that the PNPycS is the last one that was formulated in 2010, while PREAD and PPSDC were formulated before in 2001 and 2003 respectively this reflects the evolution of the concept of sustainable consumption within the country and the district.

3.1.2 Development of PREAD within the framework of the PPSDC's action plan

The DAMA (2003: 31) in the PPSDC proposes in its only action plan designed for 2004 only the following goals for the PREAD.

In the fourth call must have a 20% increase on the number of participating companies With an emphasis on the PyMES.

Promote national and international exchange.

Evaluate and adjust the postulated guide.

In the first goal, it is not clear whether the proposed increase should be taken into account since the first call for PREAD performed in 2001 or since the call immediately prior to the implementation of the policy in 2003.

If the results from the first call are taken into account, there is an increase in the MiPyMES linked to PTRAD from 800% to the year 2004 while taking into account the results between the 2003/2004 calls. The increase is 60%. If we take into account the total number of companies and not only to the MiPyMES, there is a reduction in the number of related companies, this is because in 2003 there are 28 while in 2004 there are 27, decreasing 3.5% the number of companies. Otherwise it happens if you consider this goal from the first call, this is because the total increase of companies between 2001 and 2004 is 80%.

The second Goal, that seek record the results regarding exchange experiences with international institutions, does not show documentary records, this could mean that activities of this type were not developed, are not properly registered or that these are found in restricted or restricted access documents, this could show a low disclosure of achievements by companies.

A goal indirectly proposed for the program, in the same PPSDC, refers to products and / or green services and Life Cycle Analysis (ACV) because of the lack of records in public access documents

There remains the question of whether there really are no green products and / or services and ACV or Simply have not been properly documented on the PREAD results.

This is why we used the surveys carried out on companies belonging to PREAD to investigation

date In these we performed questions related to these issues, to be able to clarify if these analyzes are actually done.

For the third goal, we find that the postulated guidelines have presented interesting changes. For example, for the year 2002, on the guide there is a classification by 12 groups according to their economic activity but for the year 2004 and 2005, the CIIU classification was fully adopted and was included the MiPyMES As target companies from the program.

Likewise, some qualification standards were adjusted and evaluation criteria were shared between the DAMA and the Autonomous Corporation of the Negro and Nare Rivers – CORNARE-, and defined three levels of recognition Postulant, On the Move towards Environmental Excellence and Environmental Excellence, Generating Sustainable Development.

In 2006 there were several administrative changes, the DAMA is now SDA and The Business Environmental Management Program –GAE- is adopted, this is composed of five levels of complexity, then the PREAD stop linking directly to the companies, to pass to receive those that carry a process of improvement in its management and environmental performance inside of – GAE -. In 2011 change the way of assessing the environmental performance in the participating companies, because before it was considered the results obtained from the immediately previous year and in this new guide is evaluated in addition to this period, the first semester of the year of postulated, which means a more up-to-date assessment.

For the 2012 guide, in the PREAD it is taken into account that the applicant companies have participated in Level III: GAE's Environmental Management Systems and also that the companies comply with the regulations adopted in the Territorial Planning Plan –POT-.

Another relevant change is in the tax benefit on the property tax, where specifies that this applies only to companies in the manufacturing sector

having as frame the CIIU code this allows a greater number of companies with the benefit, with a view to increasing business competitiveness.

Finally, on the 2013 guide, 85% of attendance of the trainings made by the PREAD is required as a minimum to maintain the recognition and continues as a requirement to enter PREAD, to have passed Level III, does not apply to companies registered before 2010.

3.1.3 Budget execution in PREAD

The budget allocation that has been made for the PREAD in the evaluated period shows that the resources have been allocated to activities specific to the program development, Such as the design and preparation of the annual postulated guide, audits to postulated companies, the awards ceremony, the awards granted by the program and the PREAD publication, among other things. It is important to note that there was no full access to the budget allocated to the program, so important aspects in the budget may not have been considered.

Figure 1 shows a semi-parabolic trend on the budget allocated to PREAD, shows the first 5 years an increase trend to the assigned ruble, records the highest peak in 2008 in more than \$ 250'000,000 allocated, then present a decreasing behavior and finalize in the year 2012 in only 50'000.000. Limited access to information is perceived in the absence of data for the years 2001, 2007 and 2013, This situation prevents a full analysis of the budget execution for the program.

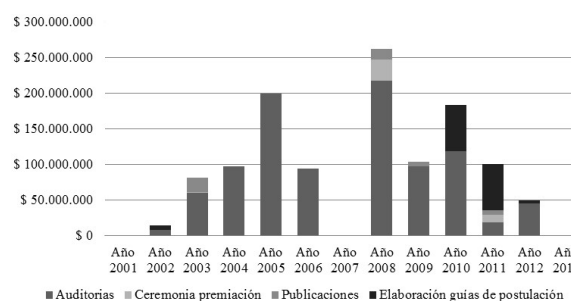


Figure 1. Budget executed in the PREAD years 2001 to 2013.

Source: Autores.

3.2 Phase II

3.2.1 Development of companies in PREAD

To create an image of the development of PREAD, it was necessary to identify the number of companies that entered the program and the type of recognition that they have managed to obtain over the years, as shown on Figure 2.

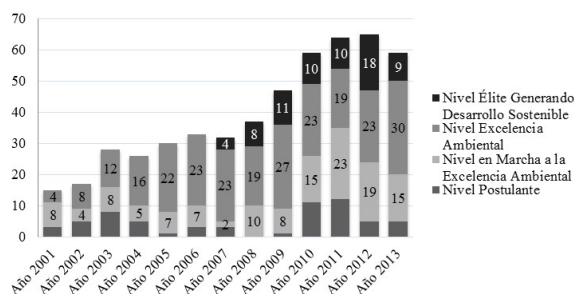


Figure 2. Total number of companies per PREAD level years 2001 to 2013.

Source: Autores

In general terms, the number of companies that have entered PREAD since 2001 has been increasing steadily, this for the year 2010 is driven by the linkage of PREAD to GAE. A clear trend, is that a high number of companies are in the level of Environmental Excellence, which leads to consider that most of them manage to achieve good performance and maintain high standards in their management systems, this is an outstanding achievement of PREAD and SDA and that is reflected in the improvement in the environmental indicators that the city possesses according to the statistics presented by the Bogotá's Environmental Observatory –OAB- Fed by the companies belonging to PREAD.

3.2.2 Indicators of environmental performance and management

As was said, the PREAD evaluates the participating companies taking into account the environmental management applied to the interior of these and its management performance, that result on the generation of indicators as the related to annual energy savings, decrease in solid waste generation,

saving on water consumption and decrease on the spills generation. Then, during the process of management evaluation and performance of companies, the PREAD assigns to each of these indicators a specific value that add a maximum of 1000 points, distributed as follow: Environmental Management 630 points, clean production 220 points and corporate social responsibility – RSE- with 150 points (GAE & SDA, 2012) since 2012. We must emphasize that in previous years the evaluation was distributed as follow: Environmental Management 400 points and Environmental performance 600 points, between the years 2005 and 2007 (SDA & UNAL, 2007) and in previous calls before to 2005 was distributed as follow: Management 300 points and performance 700 points (DAMA & UNAL, 2003). This shows part of the PREAD update process, although it does not have a defined methodology for that the historical scores for the series of indicators managed in the Program, show a characteristic behavior on companies, because there is no evidence of a relationship between the management components and environmental performance, since the management indicators have a tendency of growth year to year, but performance indicators imply a greater challenge for companies, presenting a variable behavior, as can be seen in the Figure 3. We should mention that the period evaluated covers until year 2013, the information available is only until 2007.

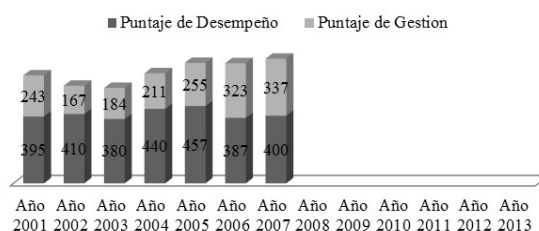


Figure 3. Annual averages in PREAD management and performance indicators 2001 to 2013.

Source: Autores.

3.2.3 Changes to checklists

Into the documental search of check lists we find three of 2003, 2007 and 2012, these are sufficient to reflect how the evolution in the methodology of evaluation of the companies.

We find that the checklists becomes more complex in each call, when have a more detailed structure of the criteria that will be evaluated and assign more specific scores. The appearance of the ACV item of the product marks a starting point on the requirements to belong to PREAD and the interest of the program in which the companies have better production analysis.

The redistribution in aspects such as the identification of environmental impacts, management commitment, among others are changing, Increasing the requirement level as evidenced by the criteria evaluated on the environmental management from 2003 to 2007, since for the first, only three aspects of importance are considered, while for the next one there are six.

On the 2012 list shows big changes on the evaluation structure, the management and performance components disappear and are contemplated on a large component called ENVIRONMENTAL MANAGEMENT, in this it is assigned 630 points.

This new component have criterion with 170 points making it the most representative in Environmental Management and according to the criteria that assesses be defined as the homologue to the Environmental Performance component of the previous checklists. The last criterion of environmental management has several points to highlight such as: Consideration of reports from previous years, Cleaner Production, LCA and CSR. Through these changes can be seen how the PREAD acquires technical and institutional maturity and how it becomes a more complex program and that represents greater challenges and constancy of the related companies.

3.2.4 Administrative changes in PREAD and its responsible institution

In its creation the Resolution 311 from 2001, establishes this Program as an incentive mechanism for companies “for the adoption of integral management practices that seek environmental quality”. In the resolution 1837 from 2006, the PREAD was renewed also was extended the con-

ceptual framework with which this came, establishing itself as an institutional program and includes in the productive sector the manufacturing and services sectors. In the latest and most recent update through Resolution 5999 from 2010 in Article 1, in addition to defining the PREAD, as in previous resolutions provides a greater emphasis on the use of clean technologies and mechanisms that companies must have. It remains within the structure of the GAE, which became the institutional program of the SDA Sub-Directorate of Eco-urbanism and Environmental Management (SEGAE) and, in the same Resolution, through article 5, creates the PREAD Matters Decision Board, "as the administrative authority of the SDA for the study, analysis, approval and resolution of the issues and conflicts of the DISTRICT ENVIRONMENTAL EXCELLENCE PROGRAM - PREAD-, strictly subject to substantive, procedural and Of control in force in the entity " (SDA, 2010).

3.2.5 PREAD and district development plans

On the management report on the development plan by Antanas Mockus, “Bogota to live all from the Same Side” Executed during the period 2001 – 2004. Is emphasized the creation of the PPSDC and the implementation of the program as the first goal of PREAD and contribution to fulfillment of other district goals, Such as technical assistance to 200 companies.

For its part, the report for the Development Plan “Bogotá without indifference” 2004- 2008 by Luis Eduardo Garzón, it is evident that the PREAD feeds several direct goals of the regional urban axis and the goals of the environmental sector directly, as is also shown, to a greater extent, by the report of the Development Plan “Bogota Positive” 2008-2012 by Samuel Moreno.

3.3 Phase III

3.3.1 Surveys applied to companies belonging to PREAD

Through 18 multiple-choice questions and 2 open questions that were answered by 25 companies, it

was possible to have a partial view of the current state of the program and the perception of the companies that are linked, because to be global it would be necessary to take into account the total of the companies belonging.

Among the most representative results are that 64% of the companies surveyed are large, 32% are medium-sized and 4% are micro-enterprises, evidencing that the percentage of MiPyMES is low with respect to the total of companies surveyed. The companies were asked about the time of connection to PREAD and it was found that 60% of them did not have a period of more than two years in the program, however, when the same companies were asked the time of linkage to the GAE, 56% responded to take between two and up to four years. That reflects that the first levels of GAE have become a platform for companies to reach PREAD and develop their environmental management on the program, considering that the survey was carried out only four years after the GAE was implemented. It was identified that 72% of the companies surveyed are in the Environmental Excellence Level, demonstrating that companies can achieve high environmental performance over short periods of time.

In profits perceived by companies, 53% is the most significant cost reduction within all benefits provided by the program, followed by the tax benefits considered by 18% of the companies. We must emphasize that the reduction of costs is not a benefit properly granted by PREAD but is a product of the autonomous management carried out by the company and that is expected of the proper application of an SGA. However, the 36% of companies say that the benefits granted are not enough, especially the tax benefits, which only apply to the manufacturing sector.

Regarding to other questions such as the link to international organizations, the generation of green products or services and the ACV, the responses by companies show similarities since most do not have them, but want to be linked or have them, except for ACV that is performed by 48% of the companies, mainly because it is a requirement of

PREAD and those who do not, are in the process of implementing it.

Finally, this survey consulted the perception about the audits carried out in the development of PREAD where, with a resounding 92%, the companies asserted that these are good.

3.3.2 Surveys carried out to companies not linked to PREAD

In order to obtain a comprehensive perception of PREAD, GAE and PPSDC by the business sector, it was decided to survey some companies that do not belong to or belong to PREAD or GAE. These companies, in total 92, answered a series of 22 multiple-choice and open-ended questions.

The first question allowed to identify the proportion in the size of the companies surveyed, with 88% of the companies belonging to the MiPyMES sector, a situation completely opposite to the view of the companies belonging to PREAD, and of these the main environmental problem was identified as generation Of solid waste, with 37%, followed by energy consumption, with 26%.

Looking know the companies knowledge level near the PPSDC, 58% say they do not have knowledge and 18% have a low knowledge about said policy; However, they do show a great interest in knowing about it, represented in 76% of the companies. A similar situation occurs with the GAE with 55% of the companies with zero knowledge and 22% with low knowledge of this Program. Finally, when consulting PREAD, 83% of companies say they do not know about it, while of the remaining 17% of companies that know the program, 44% have low knowledge of it.

The SDA website is recognized as the medium of information with the greatest impact on companies, Since 41% of the companies that know the PREAD, identify it as the means by which they knew it, besides being the second means of preference of the companies that do not have knowledge about the program, for the consultation of environmental regulations and search Of new District environmental programs, with 29%.

However of the low or low knowledge about PREAD, 67% showed interest in acquiring more information about it, preferably by e-mail with 32% of the companies inclined to this medium. Also, they have notions of the expected benefits of the program in which they stand out: the environmental recognition with 48% of the companies, competitiveness with 17% and reduction in the payment of taxes with 14%, while the rest of the companies, 21%, does not expect any benefit from it.

3.4 Phase IV

3.4.1 PREAD from the DOFA analysis

After analyzing the political-administrative scenario of PREAD and PPSDC and, also taken into account the estimated perception of the companies located in the Bogotá city, an analysis of Strengths and weaknesses was performed as PREAD internal factors and Opportunities and threats as external factors (DOFA). Then those items are cross generating the identification of strategies FO, DO, FA and DA that can be seen in table 1.

Table 1. Strategies resulting from the DOFA analysis.

FA(Strengths - Threats)	DA (Weaknesses - Threats)
Manage support chains between PREAD and partner programs.	Promote agreements between PREAD and universities, corporations and other related entities.
Apply indicators that reflect the increase in the environmental efficiency of companies	Rigorous monitoring of companies in the process of linking and linked to PREAD
Strengthen interinstitutional communication to facilitate administrative management of PREAD companies	Promote the use of Information and Communication Technologies (ICT) - promoting an integrated participation on PREAD
Utilizar resultados de las guías y auditorias como evidencia legal de cumplimiento normativo por parte de las empresas	Promote projects and international cooperation agreements linking PREAD companies
Use the results of the guides and audits as legal evidence of compliance by companies	Promote the sustainable products ACV and services and cluster formation on the program
Include updating and evaluation processes for the PREAD commission	Search of alternative sources of funding and international cooperation
FO (Fortalezas – Oportunidades)	DO (Debilidades - Oportunidades)
Strengthen the PREAD sponsorship program and strengthen the participation of new companies	Improve the different communication bridges between PREAD and SDA
Improve the promotion of PREAD's achievements through programrelated institutions	Establish evaluation and monitoring indicators for the productive sectors that allow to improve the control over the companies of the city.
Take advantage of the consolidation of productive sectors on the program to strengthen the other levels of GAE	Use a monitoring mechanism for companies that may present nonconformities on the PREAD audits
Strengthen the participation of the public sector in PREAD through the linking of this type of entities in the program	Generate alliances between productive sectors present in PREAD seeking mutual benefits and strengthen corporate environmental management
Collect and disseminate the public domain information generated from the development of PREAD	Include undergraduate and postgraduate research projects from universities related to innovation topics in cleaner production and, in general, support to the management of PREAD

Source: *Autors.*

3.4.2 The PREAD from the analysis of matrices of external and internal factors MEFE and MEFI

With the intention of complementing the results obtained through the DOFA matrix and define them in a quantitative form, the analysis of external factor matrices was developed (MEFE) and the internal factors (MEFI), Taking into account the same aspects contemplated in the DOFA matrix addressed as factors of success in the program.

Then, after assessing each factor taking into account its importance, we obtained a weighting of both external and internal factors, being this of 2.72 and 2.86, respectively, this indicates taking into account figure 4, that the PREAD must retain and maintain of the most part of strategies it currently implements, since as assessed, are those that will allow you to maintain stability, that is, continue to take advantage of the strengths you have and the opportunities that the business sector of the city presents you and thus reach a full development in the future, without allowing the program to fall.

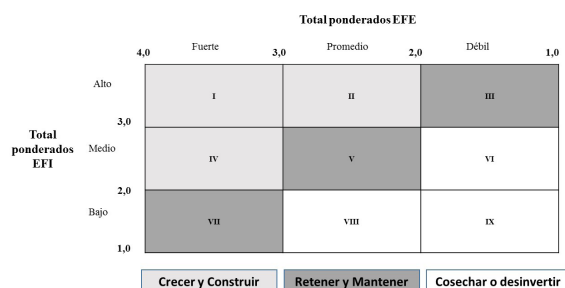


Figure 4. Program status according to EFE and EFI total.

Source: Rojas, 2014. Adapted by the authors.

However, it is necessary to consider as important the implementation of new strategies to further strengthen the program, especially those that allow the minimization of weaknesses and better face the threats that may have in a short or medium time. There is also the possibility of generating a prospective analysis about the vision that can be generated from it this should be aimed at maintaining and strengthening the management carried out in the business community, articulating its work with other similar programs at national and regional level with the objective of seeking strategies that allow the consolidation of PREAD

as a program in constant growth, that has the capacity to promote research at the city, provide the capacity to improve the life quality of the inhabitants of the District and that it has the Opportunity to become a place that catches the attention of national and international investment, helped by communication bridges and formal information as an alternative, always concentrating on the population of MyPyMES as the primary objective population of the program, according to one of the goals Of the program proposed by the PPSDC.

3.4.3 Measures for the improvement of PREAD

Taking into account the results and analyzes made through the documentary review, the surveys, DOFA, MEFE, MEFI, and especially strategies found on the DOFA matrix, three programs were formulated, that are listed below, So that the PREAD will continue with the performance that it has been showing in the thirteen (13) years of management evaluated and to promote the improvement of those aspects in which they have failures and that the companies, main involved and benefited in the program, have evidenced .

Program 1: Communication

Program 2: Socialization and accompaniment

Program 3: Evaluation and monitoring

4. Conclusions

The acceptance of PREAD by the business sector of the city is good, especially the companies belonging to the manufacturing sector, PREAD has increased the number of participating companies continuously for the 13 years evaluated, and the sectors to which they belong.

For to establish the goals that evaluate the PREAD, in addition to being clear and pertinent to the development of the program, they must contemplate the temporal period that applies to them, from the contrary, ambiguity in their interpretation can be generated, as evidenced by the first Goal set for the program in the PPSDC.

The MiPyMES are very representative in the city of Bogotá, as demonstrated in the sample defined for

the surveys, with a presence of 85% of MiPyMES companies, so is not only necessary to monitor the number of MiPyMES linked to the program, but also the formulation of strategies that allow not only the inclusion but also the continuity of companies of this type in PREAD.

The lack of documentation related to agreements with international organizations and programs, as well as the green products and / or services that may have the companies linked to PREAD, makes the program to miss opportunities not only to obtain greater recognition but also to expand, outside of the district level, and the inclusion of a greater number of companies fomenting the promotion of good environmental practices.

The socialization of the results and achievements of PREAD is one of the most important internal factors for the program, which must be strengthened through a communication and dissemination program that responds to the needs of the actors involved in the program, to complement the stage of evaluation and follow-up that it should possess.

The tools currently used by the SDA for the promotion of PREAD and GAE to companies that are not linked are insufficient to reach this type of companies, because most of them are unaware of both programs and, of course, the existence of PPSDC, taking advantage of the opportunities that each of the District's tools has to provide the business sector.

It is clear, the PREAD requires a strengthening on the management carried out to the follow-up, accompaniment and evaluation of the participating companies, in order to identify threats for the permanence of these and to be able to apply the indicated correctives, avoiding phenomena of desertion and low environmental performance.

5. References

DAMA & UNAL (2003). *Guía de postulación PREAD 2003*. Bogotá: UNAL.

DAMA (2003). *Política de Producción Sostenible para el Distrito Capital*. Bogotá: Alcaldía de Bogotá.

DAMA (2005). *DAMA - Presupuesto*. Bogotá, Cundinamarca, Bogotá. Obtenido de <http://pqr.contraloriabogota.gov.co/intranet/contenido/informes/Otros/Contrataci%C3%B3n%20Distrital%202001-2005/RECURSOS%20NATURALES%20Y%20MEDIO%20AMBIENTE/DAMA.XLS>

GAE & SDA (2012). *Lista de chequeo para auditorias PREAD año 2012*. Bogotá: SDA.

Rojas, F. (2014). *Matrices DOFA, MEFE, MEFI y MPC*. Pamplona, Valle del Cauca, Colombia.

SDA & UNAL (2007). *Guía de postulación PREAD 2007*. Bogotá: UNAL.

SDA. (2010). *Resolución 5999 de 2010*. Recuperado en Noviembre de 2014, de <http://www.alcaldiabogota.gov.co/sisjur/normas/Norma1.jsp?i=40517>

UNEP. (2006). *Acuerdos Ambientales y Producción más Limpia: Preguntas y Respuestas*. Recuperado en el 2013, de <http://www.unep.fr/shared/publications/pdf/DITx0898xPA-EnvAgreementsES.pdf>

Velasco, P., & Pedraza, Y. (2014). *Metodología de grupo*. Documento preparado como apoyo a la investigación. En: Evaluación de la política de producción sostenible para el distrito capital e identificación de medidas para su reformulación, Universidad Distrital Francisco José de Caldas, Bogotá D.C., Colombia.



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.