

Control Measures To Reduce The Environmental Impact Within The Framework Of The Development Of Domestic Activities In The Municipality Of Galeras-Sucre Colombia

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Abstract

This article presents the control measures to reduce the environmental impact within the framework of the development of domestic activities in the municipality of Galeras. It was carried out from the review of bibliographic sources that allowed defining an informative and critical text on environmental management, its elements, impact and control measures. The compilation of information was used as a collection and analysis method, it was necessary to define a mixed approach under the structure of an experimental design. A sample was taken based on the size of the population and under the consideration of a normal distribution with a margin of error of 5%, it is determined to analyze the results obtained from a group equivalent to 358 families, which were consulted from the use of interviews and the application of tools for the identification of aspects and evaluation of environmental impacts. The results made it possible to identify the areas of the home with the greatest interference in the environmental impact generated by the domestic activities carried out in the municipality of Galeras. In this way, it was possible to associate the environmental aspects that, due to their nature, intervene in each activity carried out, it was also possible to assess their impact, as well as define the control measures for their mitigation, concluding that the negative impact that generated by the development of domestic activities in the municipality of Galeras, is due to the low use of technologies, low levels of education and environmental culture and the absence of public policies that encourage the construction of solid foundations to achieve a change towards domestic environmental management cleaner and safer.

Keywords: Environmental aspect, environmental impact, control measure, environmental management, domestic activities, environmental culture.

Introduction

Environmental impact is known as any alteration that is caused in the environment. Throughout history, various environmental impacts have been generated, whether they are direct (their changes are seen almost immediately) or indirect (their effects take time to be noticed). The human being is a great generator of environmental changes or impacts, since, being in constant change and development, many of these lead to damage to the environment, putting at risk the ecosystem in which living beings live and develop, because in ecosystems not only people but also animals coexist [1].

Over time, society has turned its attention to the industrial sector in terms of the environmental impact of its activities. Countless studies and research have been carried out, resulting in a core of information that promise intervention measures with high indications of effectiveness [2]. However, and according to the authors, there is a scenario of great importance that has been marginalized over time: households and their domestic activities do not have the same interest or the same management as those carried out in industry; it is as if the impact generated were negligible or as if the existing controls were effective or sufficient. Today, it can be thought that it is necessary to evaluate actions focused on changing the consumption model and consumer habits; this scenario - defined by households and the development of domestic activities - refers to a great responsibility in environmental degradation and the capacity to change productive processes, as well as in the selection of products demanded, since the purchase of goods and services implies an environmental impact directly and indirectly due to consumption [3].

It can be affirmed that the inadequate consumption habits of people affect the environment, causing a negative impact on their health. In this way, high levels of consumption and bad domestic practices due to poor management of solid or liquid waste generated by the development of domestic activities cause environmental degradation, and if the impacts of each household are added up, the result is very likely to be alarming. It is clear that the growing trend in the production of domestic waste (solid and liquid) compromises the natural state of the elements of the environment that are related to it, which means reducing the useful life of sanitary landfills and in turn the overflowing contamination of air, water and soil in the short term [4].

Materials and methods

The compilation of information was used as a method of collection and analysis. It was necessary to define a mixed approach (qualitative and quantitative), which through the analysis of real situations due to the development of domestic activities in the municipality of Galeras, made it possible to evaluate the impacts, as well as to interpret their controls, in order to be able to conclude logically about the research topic.

Under the structure of an experimental design it was possible to control the variables that intervened in the process of compiling the bibliography consulted. It was also necessary to methodologically structure the data collection system, facilitating its interpretation and subsequent analysis.

Techniques and instruments used

The project was developed through the application of interviews with family groups in the municipality of Galeras, determined according to the sample, which in this case corresponded to 358 families. A tool for the identification of aspects and evaluation of environmental impacts was also applied, which made it possible to define the necessary control measures for the identified scenario.

Environmental impact assessment

Once the aspects have been identified, the impacts are evaluated in order to determine those that have or may have a significant environmental impact. The tool used for the evaluation of environmental impacts is the Matrix for the identification of aspects and evaluation of environmental impacts. The value of each aspect is defined according to criteria mentioned in the document "Environmental management systems - General guidelines on principles, systems and supporting techniques" [5].

- Applicable legal requirements, according to the environmental aspect and impact, such as emission limits, discharge, concession permits, among others.
- Environmental Criteria: Effect of the impact on the elements that make up the environment, defined through the intensity, extent, duration and trend over time, probability and reversibility of an aspect [6].

The qualification for each criterion has been determined according to the characteristics of the environmental aspects and impacts in accordance with the work carried out in the organization; the qualification scale is as follows (Table1).

Table 1. Criteria for the evaluation of environmental aspects.

CRITERIO	CLASSIFICATION	DEFINITION	VALOR
INTENSITY	Low affectation	Causes minor damage that does not require immediate attention	1
	Moderately affected	Causes damage requiring preventive activities on soil, water, air, flora and fauna	2
	Average affectation	Causes damage with repercussions, contaminating water sources, affecting flora and fauna, soil erosion, emission of pollutants, among others.	3

Table 1. Criteria for the evaluation of environmental aspects.

CRITERIO	CLASSIFICATION	DEFINITION	VALOR
	High affectation	Causes irreparable damage requiring mitigation significant effect on the environment or natural resources	4
	Unaffected	The impact generated does not affect the environment; it refers to a positive impact generated by the organization.	5
EXTENSION	On time	Highly localised impact	1
	Partial	Impact with appreciable effect on the environment	2
	Extensive	Detected impact on a large part of the Environment	3
	Total	Widespread impact on the environment	4
PROBABILITY	Low	It could happen under certain circumstances	1
	Media	Possible to occur sometimes	2
	High	Can occur in most circumstances	3
	Very high	Expected to occur in most circumstances	4
DURATION	Fleeting	The effect lasts for a minimum period of time	1
	Temporary	The effect lasts for the duration of the project	2
	Permanent	The effect remains after the end of the project	4
TREND	Decreasing	Expira una vez termina la actividad que lo origina	1
	Stable	It is prolonged in time but does not increase.	2
	Persistent	It is prolonged in time	3
	Accumulative	It is prolonged in time and is combined with previous or current processes.	4
REVERSIBILITY	Short term	Its alteration can be eliminated by human action, by establishing appropriate corrective measures.	1

Table 1. Criteria for the evaluation of environmental aspects.

CRITERIO	CLASSIFICATION	DEFINITION	VALOR
	Medium term	Their disturbance can be mitigated in a sustainable manner, through the establishment of corrective measures.	2
	Long term	Their alteration can be assimilated by the environment in a measurable way, due to the functioning of natural processes and self-purification mechanisms of the environment.	3
	Irreversible	Its impact implies the impossibility, the extreme difficulty of returning, by natural means, to the previous situation.	4
LEGAL REQUIREMENT	Does not exist	No regulation	1
	It exists and it complies with it	Regulations exist and are being enforced	2
	Exists and does not comply with it	Regulations exist and are NOT being complied with	4

Adapted [7].

The final assessment is defined by the interaction of the criteria. According to the implications for the target group of the non-fulfilment of each of these criteria, their proportion with respect to the final assessment is defined.

Results and discussion

Under the methodology for the identification and assessment of environmental aspects and impacts defined in the guidelines of NTC ISO 14004:2016, Environmental management systems. General guidelines on principles, systems and support techniques, the following environmental aspects were identified (Table2):

- Consumption of natural resources: Consumption of water, energy, gas.
- Waste generation: Waste of cleaning products, plastic, paper, cans and other food waste, bottles, disposables, blades, hair and body hair.
- Wastewater discharge: Used chemicals are flushed down the sewer.
- Atmospheric emissions: Gases or vapors from the use of gas for cooking, burning of waste (dry leaves and paper), energy for lighting rooms, watching TV and use of electrical appliances (air conditioners, refrigerators, washing machines, among others), water for cooking.
- Noise generation: High levels of noise from music in entertainment activities.

Table 2. Environmental impact generated on each identified environmental aspect.

Environmental Impact	Type of Impact	I	EX	PB	D	T	RV	RL	IP	Environmental significance
Atmospheric pollution.	-1	4	3	3	4	3	2	4	-34	SEVERE
Soil/water pollution	-1	2	2	3	2	3	2	2	-22	MODERATE
Increase in waste to be disposed	-1	4	4	3	3	4	3	4	-37	SEVERE
Hearing contamination and/or affectation of workers	-1	1	2	3	1	1	2	2	-16	MODERATE

Control or mitigation measures for domestic activities in the municipality of Galeras.

- **Atmospheric pollution:**
 1. Proper disposal of solid waste (dry leaves and by-products).
 2. Preventive maintenance of electrical networks and gas appliances.
 3. -Installation or maintenance of filters or grease traps for water treatment.
 4. Cleaning and cleaning to maintain areas free of waste.
 5. Training and education. Development of environmental and civic culture.
- **Soil/water contamination:**
 1. Use of biodegradable detergents and soaps, water saving campaigns.
 2. Dry procedures for floor and furniture cleaning activities.
 3. Repair leaks in pipes and carry out frequent maintenance.
 4. Rational use of water supply systems in sinks dishwashers, washbasins or showers.
 5. Ensure rational use of water when using washing machines. Take into account washing programmers of the appliance.
 6. Use biodegradable soaps or disinfectants.
 7. Installation of solids traps when necessary.
 8. Training and education in proper waste management, recycling and recovery.
 9. Composting.
- **Increase in waste to be disposed of:**
 1. Sorting waste by separating usable, recyclable and non-recyclable waste effectively.
 2. Awareness-raising campaigns to improve citizen awareness levels.
- **Noise pollution:**
 1. Use of personal protective equipment.
 2. Use of machinery with better technology

Conclusions

- Defining control measures to reduce the environmental impact generated by the development of domestic activities is an action that deserves the same importance as in the industrial sector. Municipalities and small cities, with few technologies and low levels of education, tend to generate an impact that, although not very visible, is very significant in environmental terms.
- Defining methods or mechanisms for the identification and assessment of environmental aspects and impacts guarantees a direct relationship between the cause and effect that define the conditions of the environment in which we carry out our daily and domestic activities.
- Correctly identifying the elements of the environment that are affected by the development of domestic activities is a great way to initiate change towards improving the climate impact on which we live or develop day-to-day activities.
- Evaluating the impact generated to the environmental elements is of utmost importance since in this way we can have a clear and tangible picture of the circumstances of the environment that are affected by the development of domestic activities.
- The municipality of Galeras-Colombia bases its activities on commerce. It has medium-low levels of awareness in terms of environmental compliance and management. It requires the implementation of environmental public policies in the medium and long term to help build a solid foundation to encourage a shift towards cleaner and safer household management.

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