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Model of Institutional Analysis of Barriers to Obtain CERs; under the focus of the New Institutional Economy (NIE), using a decision tool multi-criteria: Development and Application to a case in Paraguay.

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Abstract: *This article seeks to present a model of scientific analysis based on the approach of models proposed by " The New Institutional Economics " and " The Third World Development " (NIE) and " The Institutional Analysis and Development " (IAD) to identify institutional barriers. Taking the instruments of Environmental Management, Environmental Policy, Environmental Management and Legislation as variables, under the criteria of NIE thinkers, all novel awards (Willianson 2000, Ostrom 2009, North 1994, Coase 1960). Using Hierarchical Analytical Processes (AHP) as a too. Once the institutional barriers are detected, an institutional model will be proposed to overcome the barriers and thus achieve the certification of energy projects using unconventional energy. This article seeks to detect the institutional barriers that arose and the limited amount of energy projects that were certified via the clean development mechanism in Paraguay, while the Kyoto Protocol was in force. Having as background the most used mechanism for the certification of energy projects in developing countries according to the indicators of the Economic Commission for Latin America and the Caribbean (ECLAC). The legal framework under which the sale of the Reduced Emission Certificates (CERs) will be governed is still under uncertainty and will remain so until 2020 as agreed upon by the Conference of the Parties (COP21). in the city of Paris, France, 2015.*

Keywords: *New Institutional Economics, Institutional Analysis and Development, Environmental Management, Clean Development Mechanism, Certifications of Reduced Emissions.*

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I. Introduction

Since the 80s, the discussion regarding environmental issues has come to occupy an important place in international forums. Currently, and comparing with previous decades, the media, governments and society in general, are more concerned about environmental problems, especially climate change, as they threaten the planet as a whole and not just a few isolated regions. Scientific progress contributes to this greater awareness, and through scientific evidence, are largely responsible for the increase of Greenhouse Gases (henceforth GHG) in space and, because of global warming, as one of the most important Elements of Climate Change (CC). The concern of the whole world with global warming includes a new focus on nature, the problematic of the environment, since it is not a chain reaction, which arises in the environment, but expands to the economic plane and behavior social in general. As a result, of the convergence of interests in the reduction of GHG emissions, nations began to meet for discussing the consequences and solutions to this problem in the short, medium and long term.

A major global event and one of the most important drivers of global participation in solving the conflicts resulting from the intensification of the greenhouse effect was the United Nations Framework Convention on Climate Change (UNFCCC, 1992). This meeting was mainly to raise awareness about the need for countries to act jointly, because otherwise there would be many obstacles to the satisfactory resolution of global warming. For a better understanding of the institutional environment, that permeates the acceptance of Kyoto, and therefore the CDM. In this article, we will analyze the teachings of the Institutional Economy (IE) and the New Institutional Economics (NEI), since these schools express his concern to include institutional arrangements in certain organizations, institutions and power relations as endogenous and crucial factors in the analysis of the problems of the economy. According to the NIE and EI: Institutions regulate; the laws, contracts and the conditions of a market to develop and in which the transactions originate, and they are awarded a leading role in the economic improvement. They guide the actions of people, the implementation of a structure that will facilitate human interaction, whether in terms of environment, economic, political as well as religious.

The New Institutional Economics teaches that, in a market where transactions are consumed, may arise the known as transaction costs, where resources are allocated for the coordinated production of a good. These can come from the elaboration of the contracts, the obtaining of a new report on the product and competitors of bargain, the development of the negotiations and the monitoring with well marked processes (Coase, 1960, North, 1994). The New Institutional Economy (NEI) is one of the ideas of institutionalism thinking and its main concerns are: property rights; externalities; transactions and their quotes; organizations and institutions. Some of the NIE characteristics are highlighted by Zylbersztajn (cited Conejero, 2006). Interdisciplinary in areas of knowledge, some strange to the economic organism, such as administration, sociology, psychology, law, political science, history. They seek a deeper understanding of human behavior and its relationship with social institutions, NGOs, companies; the importance of institutions, their consequences on the granting of different resources and economic development; comparative analysis, to carry out an effective and relative evaluation of the different management structures, the political, regulatory and other frameworks.

II. Theoretical Framework

2.1 Environmental Management

The dictionary refers to the term management as the execution of activities to obtain a goal. In the case of the environment, the objective is, in accordance with the explicit declaration of the Single Act in the European Union (EU), in which society has a high environmental quality. This has notable consequences in the style of the activities and the development of the same ones that support it (Gómez Orea, 2003, p.145). A "policy" is a contiguous of norms or principles (normally formal and documented) that a subject, a company or an organization accepts for a certain chosen course of action. The environmental policy is not different. It is a set of formal and documented principles and intentions in relation to the environment (Roberts, Robinson, 2003, p.127). Environmental policy is understood as the set of actions and procedures with which different levels of competence and organization, supranational, of the State (Central, Autonomous and Local Administration), or companies and non-governmental organizations, aim to achieve certain conservation goals. These are protection of the environment and preservation of nature (Conesa Fernández-Vítora, 1996, p.51).

The Environmental Policy becomes a series of legal and administrative acts concerning control over the rational use of Nature. But it is also reflected in the regulation or prohibition of certain activities that are liable to harm or degrade the environment and, in general, in the admission of a set of legal-environmental guidelines whose effective application has intrinsic the purpose of defending, conserving, protecting, improve and restore the environment. Consequently, services, bodies and institutional bodies, agencies, corporations and private associations emerge, whose purpose is the protection of the environment and the improvement in human-nature relations (Jaquenod de Zsogon, 1999, p.70).

The Environmental Legislation is a symbol of this era. The preservation and promotion of the environment and the execution of a model of sustainable development is a concern of the society of these times and, consequently, of its Legal Regime (Jordano Fraga, 2002, p.95). Environmental degradation is one of the crudest problems that humanity faces. A type of erroneous development, with overpopulation, unequal distribution of economic resources and disparity in trade relations, has placed in the view of all countries the need to comply with the rules of natural balance, to guarantee the integrity and renewal of the natural systems. In short, it seeks to establish the rules that make possible the harmonious existence in a balanced and sustainable environment for the species (Jordano Fraga, 2002, p.95).

Furthermore, it should be specified that environmental regulations have a low degree of effectiveness, at least in Latin America. The causes of the low degree of "Efficiency" of the legal-environmental systems do not respond to motivations that are alien to the domestic economic order prevailing in the countries and above all, to the international economic order that determines the state of affairs that is being lived. Therefore, it would be significant that the effectiveness of the environmental guidelines could be studied together with the economic facts that are conditioning the quality of life in the villages and that are often superior to any legislative will. Regarding "Efficiency" of the legal-environmental norms, it is pertinent to mention firstly that ignorance of social phenomena often leads the legislator to adopt a voluntary attitude that solves nothing. In the same way, the ignorance of natural phenomena often leads the legislator to establish norms of effects that are even negative for the environment.

2.2 The relevance of meeting the criteria of policy, management and environmental legislation for the integrality of the processes.

In all aspects, styles of Environmental Management designed based on a strictly regulatory approach (permits, licenses, monitoring) have been generated, which gradually come to an end with some economic, fiscal and market instruments and with a greater focus of self-management The most usual classification of these instruments refers to: market instruments, and command and control instruments. Being understood by the latter, all those who are not the first. The measures to provoke a desired environmental management can be of a

different nature: preventive, repressive, dissuasive, compensatory and stimulating among other. In turn, there are different types of instruments: technical, dominant and administrative concessional regulations, criminal and administrative penalties, tax mechanisms, subsidies, economic instruments such as taxes or environmental taxes, negotiable emission permits, industrial agreements, etc. All of them, each according to its characteristics, applicable to prevent undesirable behavior, to repress those produced, to dissuade, stimulate or compensate. Among the concrete instruments for environmental management, the set of policies, guidelines, standards and technical and legal norms, activities, programs, projects and institutions that allow the application of general environmental principles and the achievement of the country's environmental objectives can be indicated; adding to these, the instruments and mechanisms of self-regulation.

2.3 Institutional Economics and New Institutional Economics

The research work will use the variable, which corresponds to the organizations and institutions, developed in the New Institutional Economy (NIE) as a tool for the analysis of ideas. In this chapter, the main ideas of Institutional Economics (IE) and the NIEs will be presented and will be presented to the application of these ideas in the object of study of this work, which is the CDM. The institutional economic approach literature is not monolithic, resulting in different branches and trends. The various schools have discordant points, but all agree on the need to include institutions as a relevant factor in economic development. The currents of institutionalism thinking do not agree with some traditional assumptions of the economy, such as the model of rational choice. According to which the agent deals with a special satisfaction, self-interest, which defines a "hierarchy" to their personal preferences, without taking into account the other actors for decision-making; and the information available is perfect and symmetrical, so the market is automatically regulated. However, contrary to traditional economics institutions of the institutional economy are the consequence of a collective social decision process endogenous to the system, and directly linked to the performance, efficiency and distribution of resources in the economy. However, institutionalisms believe that their teachings should be added to neoclassical theory, not opposed to it (Coase, 1937, Zylbersztajn, 2002).

For institutional economists, since the information existing in markets is asymmetric and imperfect, the actors do not have all the necessary knowledge in order to carry out transactions of their goods. Therefore, uncertainties may arise about transactions, and conflicts may arise among the players. At that time, institutions seem to support markets, in order to guide the actions of individuals, creating a structure that facilitates human interaction, making the actions more predictable, without, however, determining individual attitudes, because people are free to follow or not (Coase, 1937). Emphasis is placed on the importance of the institution itself, it is important to analyze the changes that go with them, how and why they occur in the economy, taking into account the particularities of each market. Therefore, even before defining the rules, it is essential to understand the context of being that gives rise to the culture, the customs, the geographical conditions, the religious aspects, the political situation. The combination of these peculiarities plays a decisive role in the success or failure of the institutional arrangements adopted (Acemoglu, 2004, Buchanan, 1975, Engerman 2002, Rodrick, 2003, Coleman, 1988).

2.3.1. Externalities

Some economic currents that incorporate environmental issues in their analysis. The first approaches of economic theory on the subject were made by Alfred Marshall (1842-1924), pointing out the microeconomic aspects of environmental issues. The author introduces the concept of "internal savings" resulting from the scale and organization of production, and "external economies" (externalities), indirect resulting from production (cited in Macedo, 2002).

[1] Environmental Management and its link with the Environmental Legislation, Support Material prepared by Dr. Hugo Cañiza, for the doctorate in Environmental Management, Graduate School, National University of Itapuá, March, 2016.

2.3.2. Institutions and organizations

The New Institutional Economics aims to explain the permanence of inefficient derivations observed in the economy. It concludes that the consequences arise from poor definitions of possession rights, in addition to the coexistence of failures in institutions that do not induce agents to move to the most efficient points. To build the accumulated knowledge and make reliable measurements, the NIE scholars have affirmed, it is essential to arrive at the agreed definitions of the institutions. "All disciplines of the social sciences or sub discipline use a different language for the key terms and focuses on the different levels of enlightenment of the 'proper' way to

understand behavior and results, you can understand why the speech can resemble a tower of Babel instead of a cumulative body of knowledge "(Elinor Ostrom, 2005b, 11).

2.3.3. Transaction prices

Within the NIE, there is a need to link the economy with the issues of belonging rights, which is specified as the accumulation of laws that describe what the mass and suppliers can do with their properties, and arises with the greater purpose of internalize externalities when acceptances of benefits outweigh their costs (Coase, 1960; Demsetz, 1967).

III. Framework of Institutional Analysis and Development (IAD)

The study of institutions depends on a theoretical commitment made at three levels of specificity that are often confused with each other. Those essential bases are (i) frameworks, (ii) theories and (iii) models. Analysis conducted at each level provides different degrees of specificity related to a specific contrariety. As indicated, an institutional framework should identify the main types of structural variables that are present to some extent in all institutional arrangements, but whose services delay the type of institutional arrangement to another. The IAD framework is therefore a multi-level conceptual map. Recently, the IAD has been integrated into a broader framework to examine SES and I will discuss this later in the article. However, there have been some small changes made to the way in which the framework was previously represented, which are going to be discuss in the following paragraphs.

3.1. Decision methods

The improvement has general peculiarities, which clearly determine it (except in multiobjective optimization), its potential being the feasible solutions that are not clearly expressed but in the form of limitations and without indecisions) (except in stochastic optimization, which is not precisely classical) (Begoña , 2007).

3.2. Hierarchical Analysis Process (AHP).

The Hierarchical Analysis Process, developed by Thomas L. Saaty (The Analytical Hierarchy Process, 1980) is designed to solve complex multi-criteria problems. The process requires the decision maker to provide subjective evaluations regarding the relative importance of each of the criteria and then specify their preference with respect to each of the decision alternatives and for each criterion. The result of the AHP is a hierarchy with priorities that show the global preference for each of the decision alternatives. In an environment of certainty, the AHP provides the possibility of including quantitative data related to decision alternatives[2]. The advantage of the AHP is that it also allows incorporating qualitative aspects that tend to be left out of the analysis due to their complexity to be measured, but which may be relevant in some cases. The AHP, through the construction of a hierarchical model, allows in an efficient and graphic way to organize information about a problem, break it down and analyze it in parts, visualize the effects of changes in levels and synthesize. The AHP "is about breaking down a problem and then merging all the solutions of the sub problems into a conclusion[3].

[2] The AHP hierarchical analysis process as a tool for decision making in the selection of suppliers, Toskano Urtado, Gerard Bruno, 1990.

[3] Thomas L. Saaty. The Analytic Hieratical Process, J Wiley, New York, 1980.

IV. Analytical Framework

In this section, the variables of the New Institutional Economy (NIE) are analyzed; It is made up of 4 variables: Transaction costs; Property law, Organizations and institutions; Externalities; the research work will focus on analyzing the variable that corresponds to the Organizations and Institutions, through the variables of the Institutional Analysis and Development Model (IAD): proposed by (Ostrom, 2009).

4.1. Discussion and Results of the Institutional Analysis Model

For a deeper analysis of the framework model proposed by Ostrom, for the institutional analysis (IAD), the methodology proposed by the Multicriteria Method (MMCC), based on the Hierarchical Analysis (AHP), will be used as analytical tool, which will detect and ponder the institutional barriers, to obtain CER Certification of Reduced Emissions (see figure 1). In general, for the analysis of the instruments of Environmental Management (environmental policy, management, environmental legislation), they will be treated jointly under the criteria of NIE scholars: Ostrom, 2009; Williansom, 2000; North, 1994; Coase, 1960, using the multicriteria tool (MMCC), based on the Hierarchical analysis (AHP).

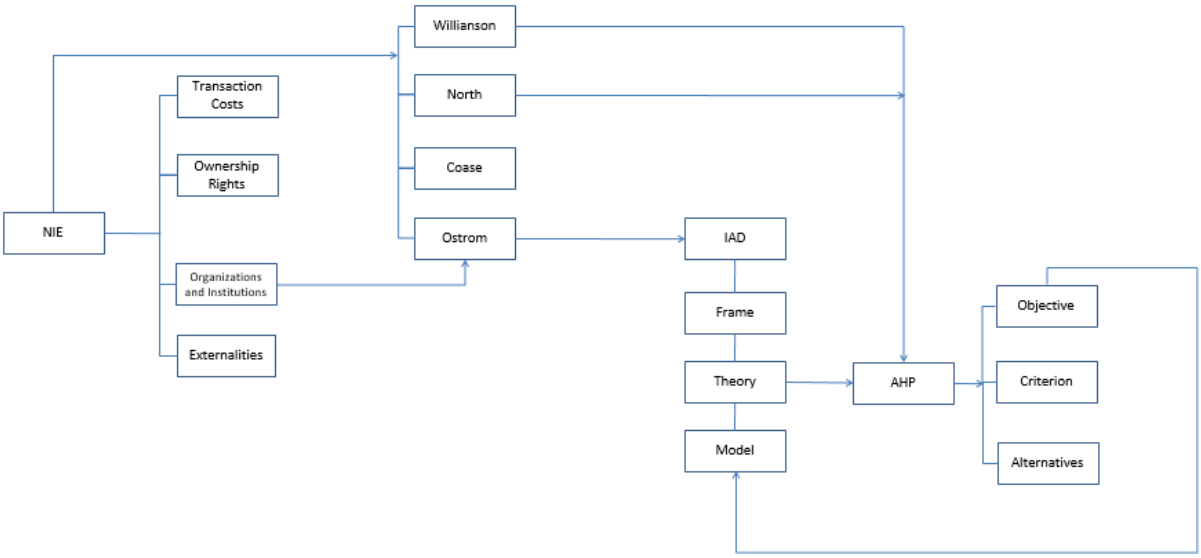

Figure 1: Institutional Analysis Model proposed to detect institutional barriers. Source: Own elaboration, 2016.

Ostrom's proposal for institutional analysis through the Institutional Analysis and Development Model (IAD) is made up of the variables indicated (see figure 2). For the analysis of the research work, the variables of the Rules in Use, situation of action and the criterion will be used, leaving aside the analysis of the biophysical conditions and the attributes of the community. Taking into account that the analysis is strictly institutional and that the analysis of the rules in use (legal aspect), situation of action (technical strategy) and the criterion (policy) are the variables that will help to detect the institutional barriers that could exist to achieve certification.

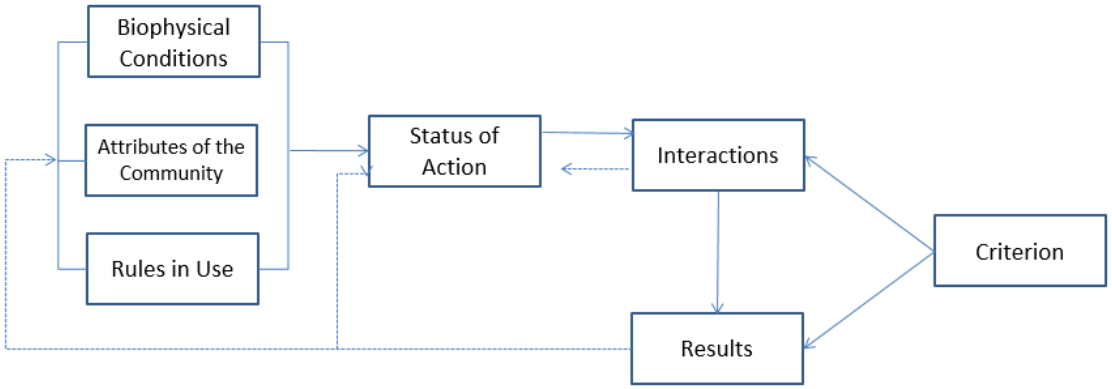

Figure 2: Framework for Institutional Analysis. Source: Ostrom, 2005 and Own Elaboration, 2016

Regarding to the status of action (technical strategy), the Ostrom proposal is made up of the variables indicated below. For the institutional analysis, the following variables will be used; the actor divided into three parts (Actor, Position, Actions), the information about the objective (Certification CER's), the control exercised over the proposed objective (CER Certification), the cost and benefit of the strategy for obtaining the objective. This last variable, which corresponds to the cost and benefit of the strategy, will be analyzed separately, in such a way as to have a more comprehensive picture and a more critical conclusion about the barriers in the institutional analysis (see figure 3).

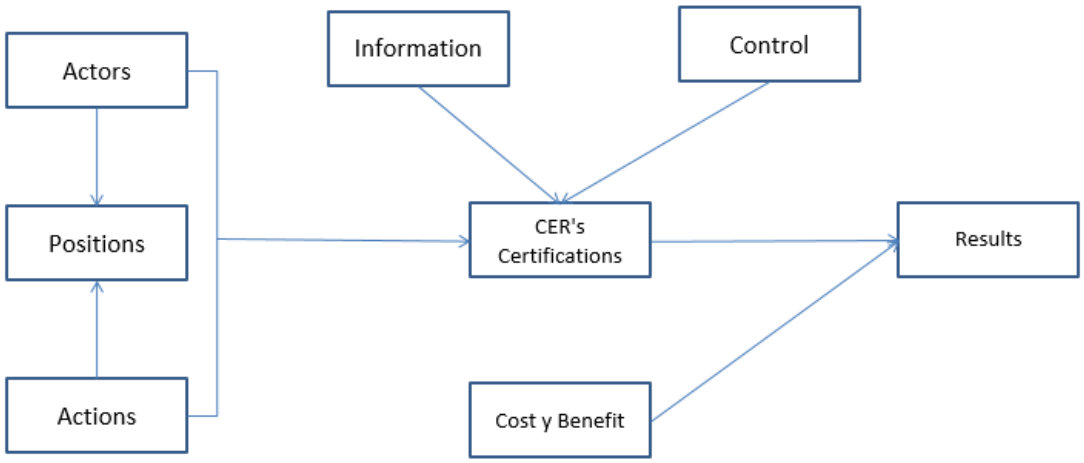

Figure 3: The internal structure of an action situation. Source: Ostrom, 2005 and own elaboration, 2017

Regarding to the proposed theoretical tool to detect institutional barriers; the research work proposes the AHP multi-criteria method. Which divides the analysis into three hierarchies or levels, for level 1 objective (Certification of the CERs); level 2, the criteria (Legal[4], Technical[5], Political[6]); level 3, there are proposed alternatives to detect institutional barriers (Actor, Position, Action, Information, Control, Cost, Benefit), (see figure 4).

4.2. Multi-criteria Method (MMCC) of the Hierarchical Analysis Process (AHP) applied to the Proposed Institutional Model CER's.

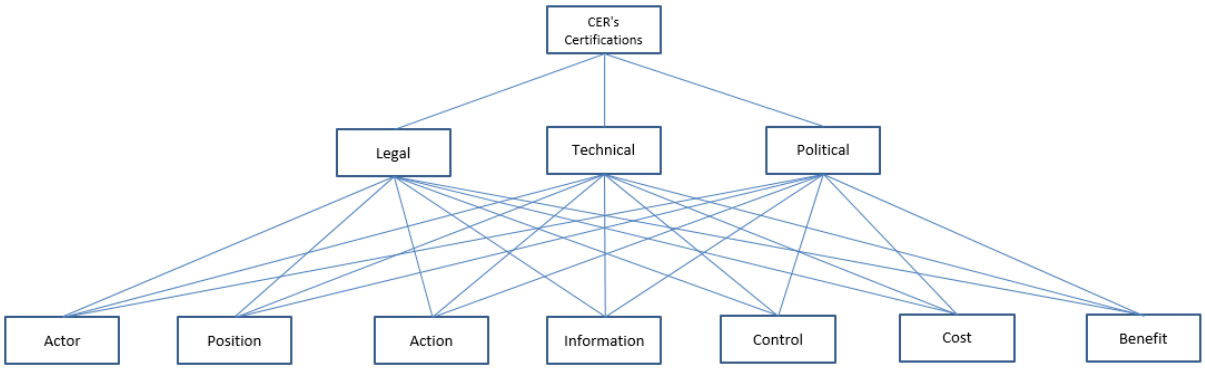

Figure 4: Hierarchical tree of decisions to detect institutional barriers to obtain the Certificates of Reduced Emissions (CERs). Source: Own Elaboration, 2016.

[4]Legal: Rules in Use.
[5]Technical: Status of Action.
[6]Political: Criteria.

Applying multi-criteria theory (MMCC) of Hierarchical Analysis of the AHP, it is verified that a 3x3 matrix is obtained in level 2 (criterion) and a 7x7 matrix in level 3 (alternatives). Regarding level 2, it is observed that the 3x3 matrix presents a consistency ratio (CR) of 0.07, a random inconsistency index of 0.58[7], of 3.08, for some order weights; technical 0.6853, political 0.2213, legal 0. 0934. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. Regarding level 3, it is visualized that the 7x7 matrix is obtained and compared with the alternatives of each one of the criteria; legal criterion, the consistency ratio (CR) of 0.06; technical criterion, consistency ratio (CR) of 0.0991; political criterion, consistency ratio (CR) of 0. 0820. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid[8]. Once the consistency ratios of the criterion matrix and the matrix of the alternatives have been demonstrated, they are within the admissible parameters. It is proceeded to make the corresponding weights with their corresponding weights and it is observed that the among the proposed alternatives to detect

institutional barriers; the control (30%); the information (25%); The benefits of the strategy (13%) are the main barriers for obtaining the Certification of Reduced Emissions (CERs), (see figure 5).

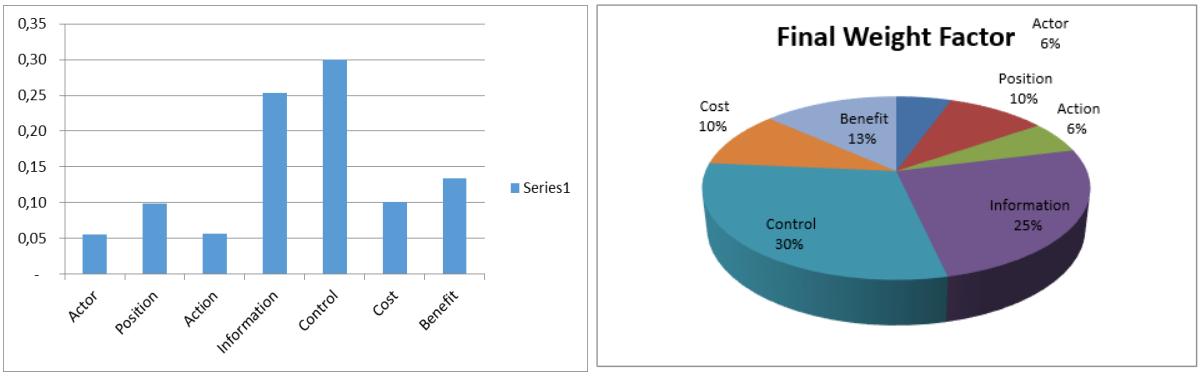

Figure 5: Results of the evaluation of each criterion under each alternative to obtain CERs. Source: Own Elaboration, 2016.

By varying the weights of the criteria (C1=C2=C3=1)[9] with respect to level 2, it is found that the 3x3 matrix has a consistency ratio (CR) of 0, λmax of 3.00, for some weights of the order; technical 0.3333, political 0.3333, legal 0. 3333. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. Regarding level 3, it is visualized that the 7x7 matrix is obtained and compared with the alternatives of each one of the criteria; legal criterion, the consistency ratio (CR) of 0.0654; technical criterion, consistency ratio (CR) of 0.0991; political criterion, consistency ratio (CR) of 0.0820. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. Once the consistency ratios of the criterion matrix and the matrix of the alternatives have been demonstrated, they are within the admissible parameters. It is proceeded to make the corresponding weights with their corresponding weights and it is observed that the among the proposed alternatives to detect institutional barriers; the control (26%); the information (29%); The benefit of the strategy (12%) are the main barriers to obtaining the Certification of Reduced Emissions (CER's), (see figure 6).

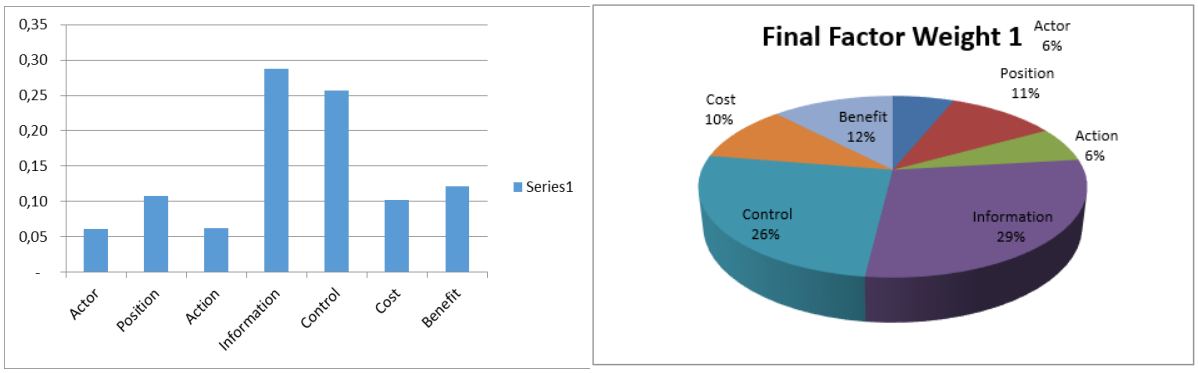

Figure 6: Results of the evaluation of each criterion (C1=C2 =C3 =1), by virtue of each alternative to obtain CERs. Source: Own, 2016.

[7]λmax=ηmax (Thomas L. Saaty. The Analytic hieratical process, J Wiley, New York, 1980.)
[8]Thomas L. Saaty. The Analytic hieratical process, J Wiley, New York, 1980.
[9]C1: Legal Criteria; C2: Technical Criteria; C3: Political Criteria.

By varying the weights of the criteria (C1 = 3C2, C1 = 3C3)[10] with respect to level 2, it is found that the 3x3 matrix has a consistency ratio (CR) of 0, λmax of 3.00, for some weights of the order; technical 0.20, political 0.20, legal 0.60. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. With regard to level 3, it is found that the 7x7 matrix has been compared with the alternatives of each of the criteria; legal criterion, the consistency ratio (CR) of 0.0654; technical criterion, consistency ratio (CR) of 0.0991; political criterion, consistency ratio (CR) of 0.0820. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. Once the consistency ratios of the criterion matrix and the matrix of the alternatives have been demonstrated, they are within the admissible parameters. It is proceeded to make the corresponding weights with their corresponding weights and it is observed that among

the alternatives proposals to detect institutional barriers; the control (24%); the information (31%); The benefit of the strategy (11%), are the main barriers, for obtaining the Certification of Reduced Emissions (CER's), (see figure 7).

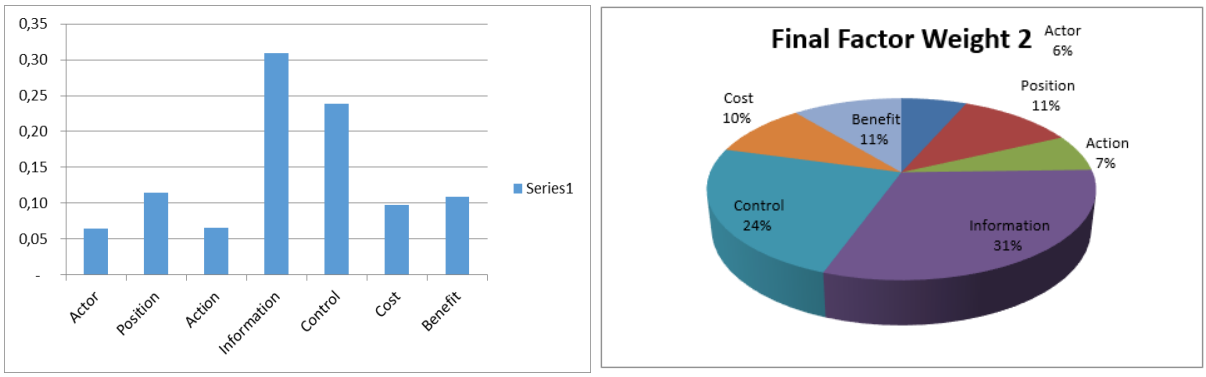

Figure 7: Results of the evaluation of each criterion (C1 = 3C2, C1 = 3C3), by virtue of each alternative to obtain CERs. Source: Own Elaboration, 2016.

By varying the weights of the criteria (C2 = 3C1, C2 = 3C3)[11] with respect to level 2, it is found that the 3x3 matrix presents a consistency ratio (CR) of 0, λmax of 3.00, for some weights of the order; technical 0.60, political 0.20, legal 0.20. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. With regard to level 3, it is found that the 7x7 matrix has been compared with the alternatives of each of the criteria; legal criterion, the consistency ratio (CR) of 0.0654; technical criterion, consistency ratio (CR) of 0.0991; political criterion, consistency ratio (CR) of 0.0820. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. Once the consistency ratios of the criterion matrix and the matrix of the alternatives have been demonstrated, they are within the admissible parameters. It is proceeded to make the corresponding weights with their corresponding weights and it is observed that the among the proposed alternatives to detect institutional barriers; the control (29%); the information (26%); the benefit of the strategy (13%), are the main barriers, for obtaining the Certification of Reduced Emissions (CER's), (see figure 8).

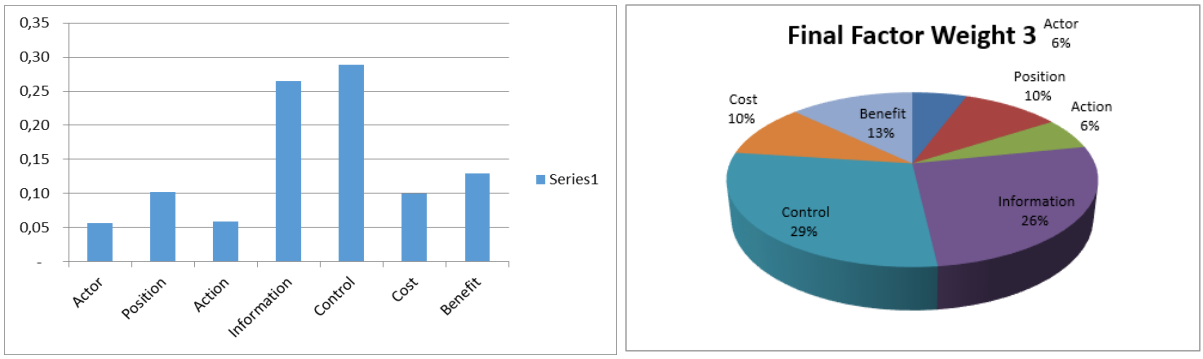

Figure 8: Results of the evaluation of each criterion (C2 = 3C1, C2 = 3C3), by virtue of each alternative to obtain CERs. Source: Own Elaboration, 2016.

[10]Idem 9
[11]Idem 9

By varying the weights of the criteria (C3 = 3C1, C3 = 3C2)[12] with respect to level 2, it is found that the 3x3 matrix has a consistency ratio (CR) of 0, λmax of 3.00, for some weights of the order; technical 0.1339, political 0.5736, legal 0. 2864. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. With regard to level 3, it is found that the 7x7 matrix has been compared with the alternatives of each of the criteria; legal criterion, the consistency ratio (CR) of 0.0654; technical criterion, consistency ratio (CR) of 0.0991; political criterion, consistency ratio (CR) of 0.0820. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. Once the consistency ratios of the criterion matrix and the matrix of the alternatives have been demonstrated, they are within the admissible

parameters. It is proceeded to make the corresponding weights with their corresponding weights and it is observed that the among the proposed alternatives to detect institutional barriers; the control (24%); the information (29%); the benefit of the strategy (13%), are the main barriers, for obtaining the Certification of Reduced Emissions (CER's), (see figure 9).

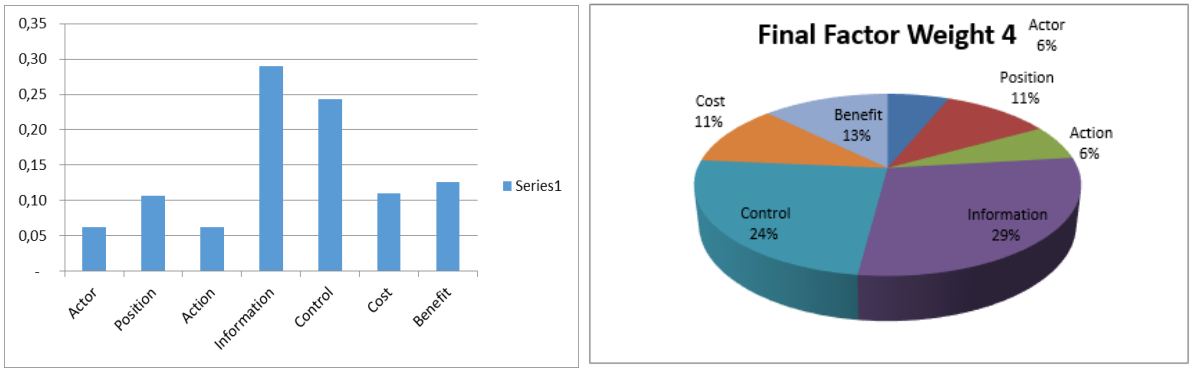

Figure 9: Results of the evaluation of each criterion (C3 = 3C1, C3 = 3C2), by virtue of each alternative to obtain CERs. Source: Own Elaboration, 2016.

Regarding to the proposed theory to detect institutional barriers in relation to the Identification of Environmental Policy. The research work proposes the AHP multi-criteria method, which divides the analysis into three hierarchies or levels. For level 1, objective (Lack of Environmental Policy) with respect to detecting the barriers to obtaining it; level 2, the criteria (Corruption, Opportunism, Change of Actor); level 3, has the proposed alternatives to detect institutional barriers (lack of resources of the actor, lack of information of the actor, lack of strategies of the actor (see figure 10).

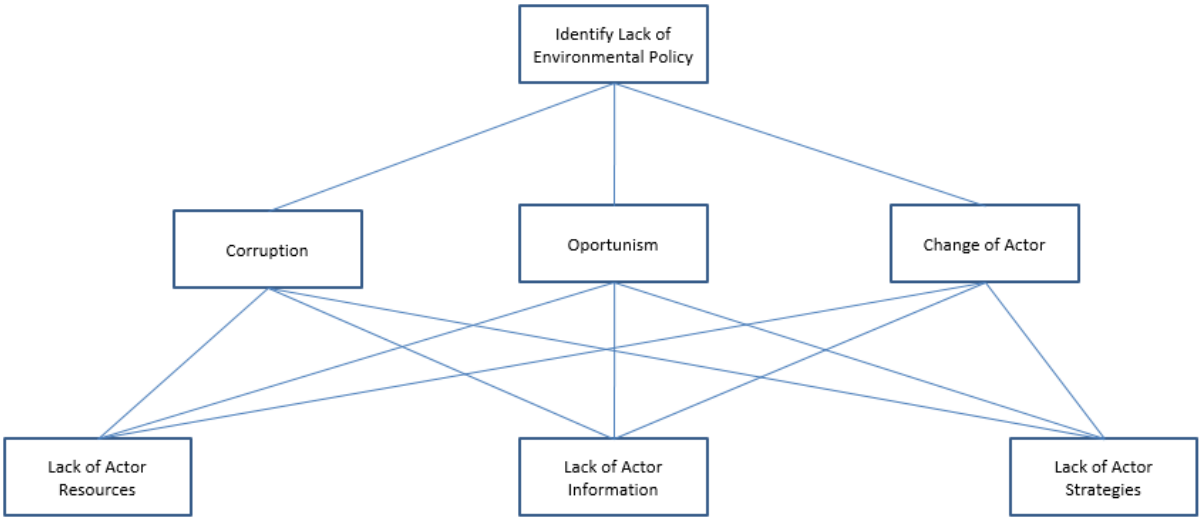

Figure 10: Hierarchical Tree of Decisions to Identify the Lack of Environmental Policy. Source: Own Elaboration, 2016.

[12]Idem 9

Applying multi-criteria theory (MMCC) of Hierarchical Analysis of the AHP, it is verified that has a 3x3 matrix in level 2 (criterion) and a 3x3 matrix in level 3 (alternatives). With regard to level 2, it is found that the 3x3 matrix has a consistency ratio (CR) of 0.001928, random inconsistency index of 0.58, λmax of 3.02, for order weights; corruption 0.1201, opportunism 0.1343, change of actor 0.7456. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. Regarding level 3, it is verified that the 3x3 matrix obtained and compared with the alternatives of each one of the criteria; corruption criterion, the consistency ratio (CR) of 0.0718; opportunism, consistency ratio (CR) of 0.048; actor change, consistency ratio

(CR) of 0.0213. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. Once the consistency ratios of the criterion matrix and the matrix of the alternatives have been demonstrated, they are within the admissible parameters. It is proceeded to make the corresponding weights with their corresponding weights and it is observed that the among the proposed alternatives to detect institutional barriers; Lack of Strategies (62%); Lack of Resources (25%); Lack of Information (13%), are the main barriers, to identify the Lack of Environmental Policy, (see figure 11).

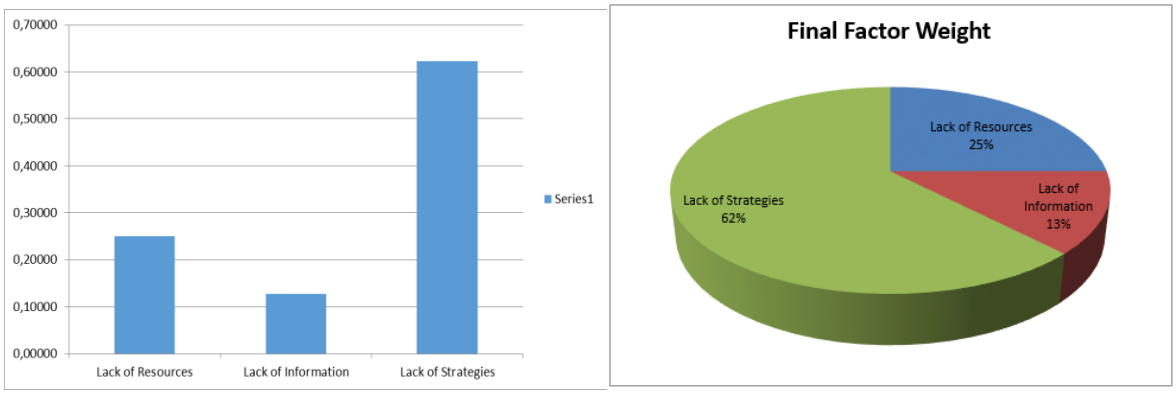

Figure 11: Results of the evaluation of each criterion under each alternative to Identify the Lack of Environmental Policy Source: Own Elaboration, 2016.

Regarding to the proposed theory to detect institutional barriers in relation to the flaws in the current Regulations. The research work proposes the AHP multi-criteria method, which divides the analysis into three hierarchies or levels. Level 1, objective (Detect flaws in the current Regulations) with regard to detecting the barriers to obtaining it. Level 2, criteria (New Regulations, Apply current regulations, Reduce the excess of laws). Level 3, has the proposed alternatives to detect institutional barriers (Effectiveness of the current Regulation, Effectiveness of the current Regulation, Efficiency of the current Regulation, (see figure 12).

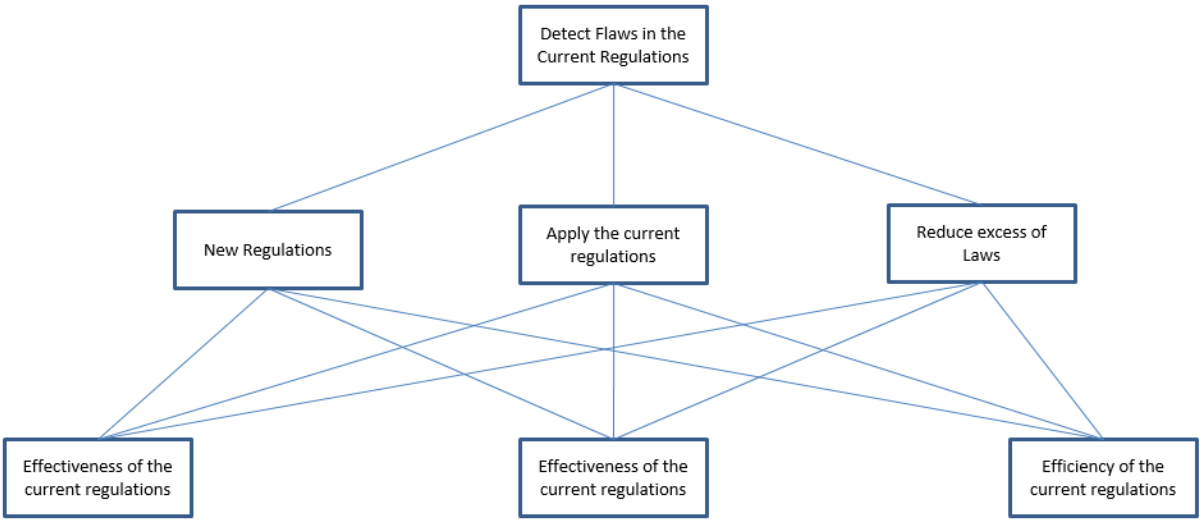

Figure 12: Hierarchical Tree of Decisions to Detect Failures in the Regulations in Force Source: Own Elaboration, 2016.

Applying multi-criteria theory (MMCC) of Hierarchical Analysis of the AHP, it is verified that has a 3x3 matrix in level 2 (criterion) and a 3x3 matrix in level 3 (alternatives). Regarding to level 2, it is found that the 3x3 matrix has a consistency ratio (CR) of 0.0141, random inconsistency index of 0.58, λmax of 3.01, for some order weights. New Regulations 0.0782, apply the current regulation 0.4866, reduce the excess of laws 0.4353. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. Regarding level 3, it is verified that the 3x3 matrix obtained and compared with the alternatives of each one of the criteria; Criteria New Regulations, the consistency ratio (CR) of 0.0870; apply current regulations, consistency ratio (RC) of 0.003; reduce the excess of laws, consistency ratio (CR) of 0.0030. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. Once the consistency ratios of the criterion matrix and the matrix of the alternatives have been demonstrated, they are within the admissible

parameters. It is proceeded to make the corresponding weights with their corresponding weights and it is observed that the among the proposed alternatives to detect institutional barriers; Effectiveness (48%); Efficacy (45%); Efficiency (7%), are the main barriers, to detect flaws in current regulations (see figure 13).

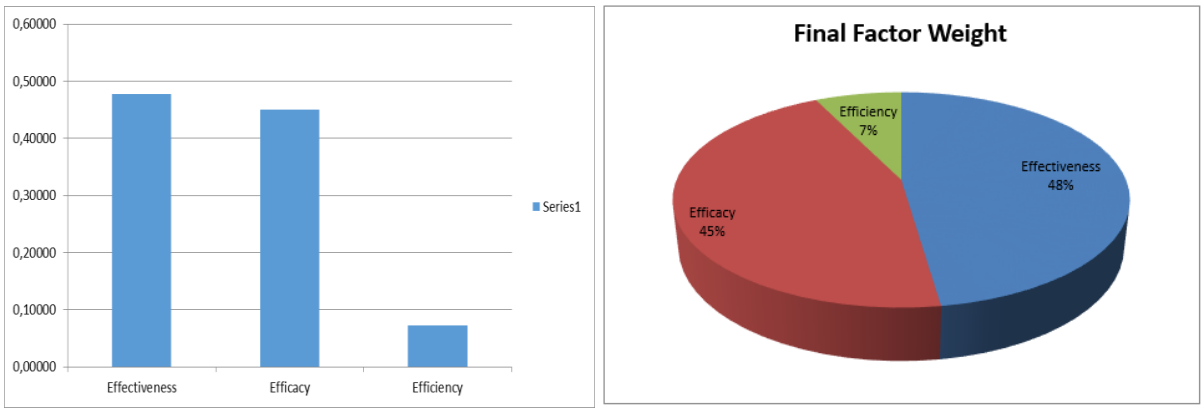

Figure 13: Results of the evaluation of each criterion under each alternative to detect faults in the current regulations. Source: Own Elaboration, 2016.

Regarding to the proposed theory, to be able to determine the model that allows overcoming institutional barriers under a vision with sustainable energy development. In the research work, the multi-criteria AHP method is proposed, which divides the analysis into three hierarchies or levels. Level 1, a framework that allows the implementation of an environmental policy with a vision of sustainable energy development. Level 2, the criteria (political feasibility, economic viability, legal viability, technical feasibility). Level 3, the proposed alternatives to overcome institutional barriers (Inter-institutional coordination at the operational level of the ministries, Ministry of Energy and Environment, National Council for environmental policy and energy for sustainable development[13] (see figure 14).

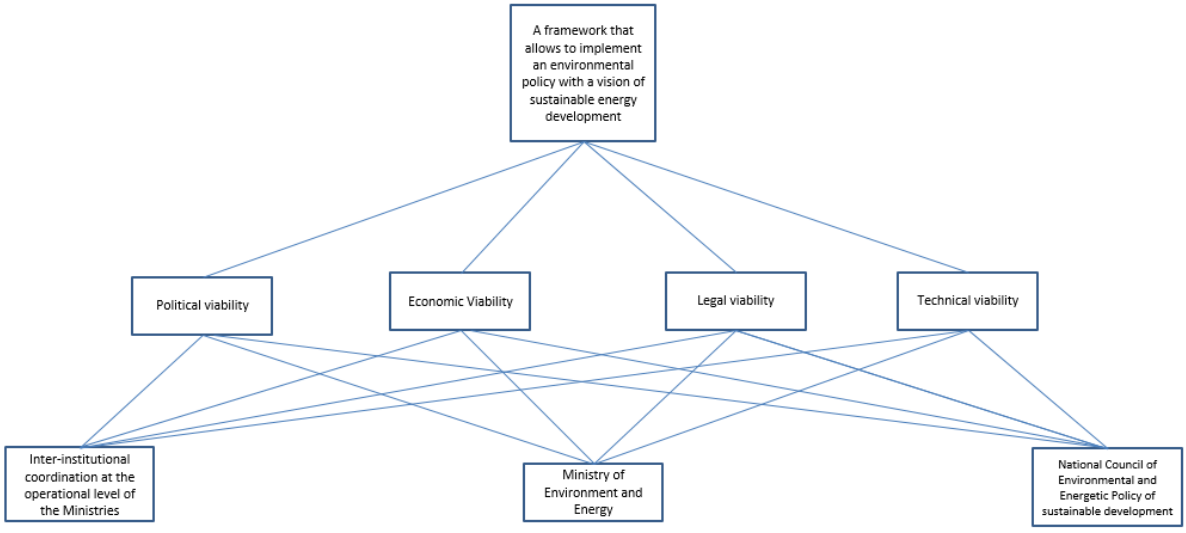

Figure 14: Hierarchical tree of decisions to obtain a framework that allows to implement an Environmental Policy with a Vision of Sustainable Energy Development. Source: Own Development, 2016.

[13] The alternatives proposed in level 3, for overcoming institutional barriers will be explained in detail.

Applying the multi-criteria theory (MMCC) of Hierarchical Analysis of the AHP, it is verified that obse has a 4x4 matrix in level 2 (criterion) and a 3x3 matrix in level 3 (alternatives). Regarding level 2, it is found that the 4x4 matrix has a consistency ratio (CR) of 0.0826, random inconsistency index of 0.9, λmax of 4.22, for some order weights; Political Viability 0.616, Economic Viability 0.056, Legal Viability 0.1639, Technical Viability 0. 1639. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable

consistency and is valid. Regarding level 3, it is verified that the 3x3 matrix obtained and compared with the alternatives of each one of the criteria; Criteria Political viability, the consistency ratio (CR) of 0.0624; Economic Viability, consistency ratio (CR) of 0.086; Legal viability, consistency ratio (RC) of 0.0639, Technical viability, consistency ratio (CR) of 0.0630. The consistency ratio (CR) is less than 0.10, so the matrix has a reasonable consistency and is valid. Once the consistency ratios of the criterion matrix and the matrix of the alternatives have been demonstrated, they are within the admissible parameters. It is proceeded to make the corresponding weights with their corresponding weights and it is observed that the among the proposed alternatives to detect institutional barriers; Inter-institutional coordination at the operational level of the Ministries (77%); Ministry of Environment and Energy (12%); National Council for Environmental and Energy Policy for sustainable development (11%), (see figure 15).

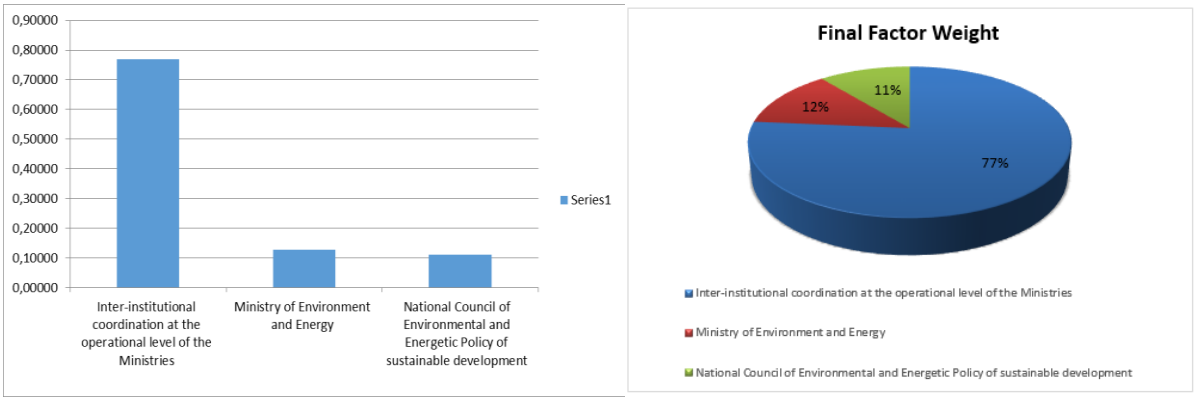

Figure 15: Results of the evaluation where the objective is a framework that allows implementing an environmental policy with a vision of sustainable energy development. Source: Own Elaboration, 2016.

V. Conclusion

The possible barriers that could be taken to obtain the Certification of Reduced Emissions CERs were analyzed and identified. The model of institutional analysis and IAD development proposed by (Ostrom, 2009) was applied, with the corresponding variables. This allowed us to detect the institutional barriers. It was possible to detect that the information 25%, the control 30% and the benefit of the strategy needed to meet the 13% target could initially be barriers. Elaborating the sensitivity of the analysis; varying only the criteria (level 2), and giving the weight of 1 to all the criteria. It was possible to found that there is variation in the results of the alternatives, obtaining that the information 29%, the control 25%, the benefit of the strategy 12 %, so information is the most important when assessing sensitivity. However, independent of all this, what can be detected is the result of an adequate lack of application of environmental policy by the Environmental Secretary (SEAM). As a second point, it was analyzed what could be the barriers for a correct application of the environmental policy. Taking into account that the actor currently has a current environmental policy but that does not work; the analysis resulted in the lack of strategies in 62%, compared to the lack of resources of 25% and the lack of information of 13%, which confirms a lack of adequate management. As point 3 the current regulations were analyzed and the lack of effectiveness of the current regulations was detected as a barrier in 48%, the lack of effectiveness of the current regulations in 45%, the lack of efficiency of the current regulations in a 7 %. In these last two analyzes the sensitivity will not be evaluated taking into account that only 3 variables are available as criteria (Level 2) and 3 variables as alternatives (Level 3), so it is not worth applying.

Regarding the model proposed in the research work to overcome the institutional barriers detected using the IAD proposed by Ostrom. It is observed that it would be necessary to create an Inter-institutional Coordination at the operational level of the ministries (77%); Ministry of Energy and Environment (12%); National Council for Environmental and Energy Policy for sustainable development (11%). If the sensitivity is made by making all the weights in level 2 (Criteria) of the 4x4 matrix equal to 1. It is observed that it would still be necessary to create an Inter-institutional Coordination at the operational level of the ministries (78%); Ministry of Energy and Environment (13%); National Council for Environmental and Energy Policy for sustainable development (9%), as a valid alternative to overcome the institutional barriers detected.

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