

## **Factores determinantes de las políticas públicas de drogas en México. Un estudio a través del algoritmo de Saaty**

### **Determining factors of public drug policies in Mexico. A study through Saaty's algorithm**

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#### **Resumen**

Esta investigación busca identificar los factores que influyeron en la evidencia empírica en las políticas públicas de drogas en México durante el periodo 2006-2018, para lo cual se implementó un método de ponderación de variables a través del Algoritmo Saaty. Se tomó como variable dependiente las políticas públicas de drogas en México, y para asignar variables y dimensiones independientes se realizaron dos cuestionarios en momentos diferentes: el primero correspondiente a la asignación de valores a las variables, y el segundo a las dimensiones de las variables resultantes del primer estudio. Para corroborar la asignación de pesos a las variables, se seleccionaron 26 expertos en el tema de política de drogas en México. Los resultados muestran que las variables independientes con mayor peso según los expertos fueron: intereses económicos, estereotipos, influencia internacional y valores morales, en ese orden.

**Palabras clave:** Políticas públicas de drogas, Algoritmo Saaty, México.

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*Abstract*

This research seeks to identify the factors that influenced the empirical evidence in public drug policies in Mexico during the period 2006-2018, for which a weighting variable method was implemented through Saaty Algorithm. Public drug policies in Mexico were taken as a dependent variable, and in order to assign independent variables and dimensions, two questionnaires were carried out at different times: the first corresponding to the assignment of values for the variables, and the second to the dimensions of the variables resulting from the first study. In order to corroborate the assignment of weights to the variables, 26 experts on the subject of drug policy in Mexico were selected. The results show that the independent variables with the highest weighting according to the experts were: economic interests, stereotypes, international influence and moral values, in that order.

**Keywords:** Public drug policies, Saaty Algorithm, Mexico.

## 1. Introduction

Public drug policies have failed to meet their objectives of reducing violence. Academics and activists contend that violence is, indeed, a by-product of the current approach to illegal drugs. Moreover, not only have the intended goals of reducing consumption and regulating the illicit drug market, with estimated profits at 3.6% of the Mexican Gross Domestic Product (Solís, 2013), not been achieved, but the complexity of the issue goes beyond the violence associated with the illegality of certain drugs. It encompasses economic analysis and the scrutiny of excessive punitive measures.

Similarly, the costs associated with policies regulating this phenomenon are intricate, leading to economic consequences. It has been estimated that in Mexico, \$16 dollars are spent on supply control for every dollar allocated in reducing demand (Barra, 2013; García del Castillo, et al., 2014; Hernández, 2021; Pons, 2008; Solís, 2013; Sohoni, et al., 2021; Vellinga, 2004).

The ideological and political foundation supporting current public policy measures, specifically those advocating drug prohibition, has been associated with racist and xenophobic viewpoints (Labate & Rodrigues, 2015; Solomon, 2020). Additionally, the consumption of certain substances has been characterized as contributing to the “degeneration of the race” or engaging in immoral behavior (Campos, 2010; Conrad, 2021). Presently, these perspectives are observable in the profiling of individuals detained for drug-related offenses, as this profiling aligns with various prejudices and the criminalization of specific social classes and races (Arana & Germán, 2005; Boiteux, et al., 2014; Camplain, 2020; Labate & Rodrigues, 2015).

Nowadays, public health policies show a stigmatization of consumption that usually leaves aside educational criteria of prevention to be promulgated exclusively towards abstinence, ignoring strong data in relation to consumption and the importance of the context in which it is consumed (Atuesta, 2019; Romani, 2008).

In Mexico, health policies are carried out on the issue of illegal drugs, with a crossing, also given worldwide, of safety and health that is materialized in the law for trafficking and possession of illicit substances that overload the judicial system. In conjunction with these measures, the prohibition has been accompanied by military operations that, in the first instance, seek to completely end the supply of illegal drugs, and secondly – or, consequently – to dismantle organized crime in the country. Thus, it is found that the drug security strategy not only shows a failed tactic in the prohibitionist context of the black market and the use of public forces to curb demand, but also provokes greater violence (Atuesta, 2014; Atuesta, 2018; Martínez, 2020; Solís, 2013).

The failures in public drug policies in Mexico become more important when the role of public policies in the execution of the State’s ultimate objectives is highlighted. Weber (1919) forged the ideal of a highly specialized and intellectual politician, whose absence would lead to failure in the technical achievements of the State. In an analogous way, finding a body of public policies in which there seems to be a lack of knowledge about the empirical evidence, could insinuate a total failure in the reason for being of public policies, and their role as embodiments of the actions of the State. The identification of factors outside this knowledge becomes a key task to understand the inflexibility of public drug policies. The first of these factors to point out, ideology, can be found in documented cases in which the empir-

ical evidence was shaped from ideological bias, impacting government decisions that would change a Prohibitionist regime to another interested in harm reduction, as well as in-depth research that would help understand the real health threats of substance use (Hall & Degenhardt, 2009; Macleod & Hickman, 2009; Walsh & Jelsma, 2019).

The presence of factors such as ideology embodied in representations, values, attitudes, legitimations and modes of organization of practices, has been linked to all “care process” (Romaní, 2008: 302), among which can be found the one related to public drug policies; and not only would this factor determine practices, but it would legitimize all professional activity in the field of health, having science as the ultimate reference (*ibidem*).

A second element that seems to come before empirical knowledge in the development of public drug policies is US intervention in Mexican public policy decisions, in which there is a constant attempt to force the Mexican government to take strong measures against drug trafficking in the country, without even the US government being able to comply (Pérez, 2019; Reich & Aspinwall, 2013). In the United States, contrary to a regime implementing measures whose ultimate goal is public health, there is a poor distribution of limited treatment resources to the wrong people; too many treatment spaces are occupied by casual recreational users rather than meeting diagnostic criteria, for example through drug courts (Keene, 2001; Nicholson, *et al.*, 2012).

The approach proposed by the US influence towards Mexican politics is shown to be ineffective and, furthermore, it is expected of said government, if there is a requirement regarding compliance with prohibitionist standards, to give in return the sovereignty that the country requires. The Mexican case, different from the American one, does not reflect the homogeneity of interests that underlies the character of the capitalist State: abstract and impersonal; instead, the Mexican State becomes an instrument for the dispute of hegemony by power groups. Among these groups are drug cartels. Therefore, while the Mexican State retains the corporatism, authoritarianism and clientelism of the previous regime, it borrows from the neoliberal regime – pushed by the United States – the idea of minimal intervention (Ai-Camp, *et al.*, 2013; Solís, 2013).

The social agents emerging from this lack of State structure and legitimation become the main beneficiaries of the profitable global business that is the drug economy (Ai-Camp, 2010), and it is from this same lack of legitimation that the Mexican State has been described – especially during the beginning of the drug war during the government of Felipe Calderon – as a failed State, at least in the sense that it was given after the Cold War: as a new threat (Call, 2008; Garmany, 2011; Morton, 2012; Rosen & Zepeda, 2015; Sánchez, 2019).

The research gap covered by this work is first identified in the literature and highlights the need for a comprehensive investigation that goes beyond a mere extrapolation of approaches and strategies applied in other countries. The specificity of the Mexican context demands a deeper and more specific analysis that considers key elements for the formulation of effective anti-drug policies tailored to national realities. The lack of exhaustive research incorporating moral values, political ideology, party interests, stereotypes, economic interests, and evidence-based knowledge of drug public policies in Mexico represents a significant contribution in understanding this complex phenomenon (Juárez, 2011; Muñoz & Rojas, 2019; Slapak & Grigoravicius, 2007).

The incorporation of moral values and political ideology is crucial to understanding how ethical beliefs and ideological principles influence policy decision-making regarding drugs (Seidel, 2021). Additionally, consideration of party interests would shed light on internal political dynamics that may shape anti-drug policies in a specific manner within the Mexican context (González, 1989).

Stereotypes, on the other hand, play a crucial role in public perception of drug consumers and policy formulation. Comprehensive research should examine how these stereotypes influence policy-making and how they can be overcome to ensure a fairer and more equitable approach (Del Olmo, 1989; Ornelas, 2010).

Furthermore, the inclusion of economic interests is fundamental to understanding how economic forces can influence policy formulation, whether through legalization to potentially generate tax revenue or through more restrictive measures to protect certain economic sectors (Tenorio, 2010 Méndez, 2012).

Finally, integrating evidence-based knowledge of public drug policies in Mexico is essential to ensuring that implemented strategies are supported by robust data and measurable outcomes, providing a more effective and efficient framework.

In summary, addressing this gap in the literature involves conducting research that not only considers models applied in other countries but delves comprehensively into the complexity of the Mexican context, incorporating all these elements is essential to precisely address the discipline being developed in this work, which specifically focuses on public policies, particularly those related to drug control.

Although these peculiarities are not unique to the Mexican State, the factors indicated seem to suggest a series of elements foreign to the empirical evidence that, in practice, weigh more in the elaboration of public drug policies and that, ultimately, could help explain the inflexibility of the measures adopted so far. The objective of this study is to identify and point out the factors that precede the use of the available empirical evidence, in order to create a hierarchy based on the opinion of experts on the subject.

The article is structured as follows, first is the introduction, in the second section are the materials and methods, then the results are found, in the fourth section the discussion is presented and finally the conclusions.

## **2. Materials and methods**

### **2.1. Decision theory**

Optimization can be defined as a way of making a decision between feasible alternatives; therefore, all decision making is a process that can be understood as the choice of the “best” among the “possible”. However, defining what is best leads to different decision situations. Outside of the so-called classical optimization, in which the general characteristic that the best is unique and clearly determined and that what is feasible is expressed only in the form of restrictions and without uncertainty, there are other decision contexts that make up the theory of optimization. In this study, the relevant criteria were established based on their relevance for decision-making and then prioritized by weighting them according to their rela-

tive importance (Almudevar, 2021; Embrey, 2020; Montesano, 2022; Karni, *et al.*, 2022; Kiran, 2022). The three main blocks in which the analysis is addressed are: decision theory with uncertainty or risk, multi-criteria decision and game theory (Fernández, 2007). This study uses one of the methods belonging to the multicriteria decision, so it is relevant to mention some of the related methods.

## 2.2. Multicriteria decision

When trying to define what is best and what is possible, different means can be found from the multicriteria decision. There are, for example, multi-objective optimization methods, which seek to optimize the objectives, satisfying rigid restrictions that determine the feasible región (De Andrés-Nogales, *et al.*, 2021; Peters & Protopapas, 2021). Within them, there are also methods to generate the efficient set in its entirety and methods to solve the compromise (Blagojević, *et al.*, 2023; Guarga, *et al.* 2019; Fernández, 2007).

The weighting method, developed by Zadeh (1963), solves different problems posed by parametric programming, in which each objective is multiplied by a non-negative weight or factor and they are added in a single function. On the other hand, the method of  $\varepsilon$ -*restricciones* developed by Marglin (1967), optimizes one of the objectives and incorporates the rest as parametric constraints, solving the problem also through parametric programming. Additionally, Zeleny & Cochrane (1973) with multiobjective simplex method evaluates in each iteration the efficiency of the basic solutions obtained, or extreme points, and creates an efficient set of convex linear combinations of efficient extreme points that are adjacent.

Then, we have the satisfying methods based on the logic made by Simon (1957), where it is established that the current contexts of decision, which have incomplete information, limited resources and conflicts of interest, among others, lead to the decision maker trying to get a series of goals closer to the preset aspiration levels as much as possible (Masoudi-Sobhanzadeh, 2022). From these methods, the so-called goal programming arises, which moves away from the philosophy of optimization and adheres to that of Simon (1957), constituting the operational dimension of this “satisfying” philosophy.

Subsequently, there are discrete multicriteria decision methods in which there is a set of finite alternatives to be considered by the decision maker and normally not too much (Muñoz & Romana, 2016). Within these we have the electre method, developed by Benayoun, *et al.* (1966), which aims to reduce the set of efficient solutions. Finally, within the discrete multi-criteria decision methods, the method of *Analytic Hierarchy Process (AHP)* introduced by Saaty had a great theoretical and applied impact (Fernández, 2007). Its characteristics will be explained in detail in the following paragraphs, since it has been the methodology chosen for this study.

## 2.3. Analytic Hierarchy Process (AHP)

The Analytic Hierarchy Process (AHP) is a procedure for comparing criteria in pairs in which, by means of a square matrix, in which there are several rows and columns defined by the number of criteria to be weighted, the comparison is established between pairs of criteria. In this matrix, the importance of each criterion is compared in relation to the others, to then establish a main eigenvector that establishes

the weights ( $w_j$ ), providing a quantifiable measure of the consistency of value judgments between pairs of factors (Saaty, 1987, p. 17). A more detailed explanation of this process can be summarized as follows:

- First, in each row the relative importance of the variable is established, always in relation to the variable in the corresponding column. With this procedure, all the rows of the matrix must be completed, capturing in the upper-right triangle the inverse value of the cell corresponding to the lower-left triangle.
- Afterwards, it is necessary to multiply the weights of each row and then determine the root, whose number will depend on the number of observations.
- To complete the process, the roots obtained must be added to then divide the roots of each normalized data by the result of the sum, and finally the weight given to each variable or dimension.

The AHP method requires that each criterion and alternative be weighted relative to other criteria and alternatives in the form of pairwise comparisons. This implies that a level of preference must be indicated by comparing each element one against one for all possible combinations.

To carry out the comparisons, a scale of numbers is necessary that indicates in how many magnitudes an element is preferable (criterion or alternative). Over another in relation to the property with respect to which it is analyzed (Saaty, 1987). The criteria of the scale are established in the following table:

**Table 1**

*Criteria of the Saaty scale*

Intensity	Definition	Explication
1	Of equal importance.	Activities contribute equally to the goal.
3	Moderate importance.	Experience and judgment slightly favor one activity over the other.
5	Strong importance.	Experience and judgment strongly favor one activity over the other.
7	Very strong or demonstrated.	One activity is much more favored than the other: its predominance has been demonstrated in practice.
9	Extreme.	The evidence favors one activity over the other, it is absolutely and totally clear.
2, 4, 6, 8	Intermediate values.	When a compromise of parts between adjacent values is needed.
Reciprocal	$A_{ij}=1/a_{ji}$	Method hypothesis.

*Note.* Own elaboration based on Saaty (1987).

In this way, a global measure of consistency is given to the matrix once the weights have been assigned. Thus, it is possible to assess the relationship of the criteria among themselves and determine their coherence and relevance (Saaty, 1987).

The method involves constructing a decision hierarchy, where the main objective or problem is at the top, followed by criteria and sub-criteria, and finally, the available alternatives.

Participants then compare and assign numerical values to the pairwise comparisons between criteria and alternatives based on their relative importance or performance. These comparisons are used to derive consistency ratios, ensuring the reliability of the judgments made. AHP employs mathematical computations to calculate weighted scores and eigenvalues, resulting in a synthesized ranking that reflects the overall preferences and priorities (Saaty, 1987).

AHP is widely applied in various fields, such as business, engineering, environmental studies, and public policy, providing a structured and systematic approach to decision-making that accommodates both quantitative and qualitative factors. The flexibility and comprehensiveness of AHP make it a valuable tool for tackling complex decisions with multiple criteria and alternatives (Saaty, 1987).

The Analytic Hierarchy Process (AHP) is implemented through a series of structured steps (Saaty, 1987):

- a. **Hierarchy Construction:** Identify the main objective or problem and break it down into a hierarchical structure, comprising criteria, sub-criteria, and alternatives.
- b. **Pairwise Comparisons:** Participants systematically compare the importance of each criterion and sub-criterion with respect to the others, as well as the performance of each alternative against the criteria. These comparisons involve assigning numerical values that reflect the relative significance or preference.
- c. **Data Collection:** Gather the pairwise comparison data from participants. This is typically done through surveys, interviews, or group discussions.
- d. **Consistency Checking:** Ensure the consistency of the comparisons by calculating consistency ratios. Participants may need to revise their judgments if inconsistencies are detected.
- e. **Weight Assignment:** Use mathematical computations, such as the eigenvector method, to calculate the weights for each criterion and sub-criterion based on the pairwise comparison values.
- f. **Score Calculation:** Apply the weights to the performance scores of alternatives within each criterion to obtain the overall scores for each alternative.
- g. **Synthesis and Ranking:** Aggregate the scores across all criteria to generate a synthesized ranking of the alternatives. This ranking reflects the overall preferences and priorities based on the input provided by participants.

AHP is a versatile decision-making tool that accommodates both quantitative and qualitative factors, providing a systematic and transparent approach to decision-making in diverse fields (Saaty, 1987).



### 3. Results

For the election of the independent variables, an extensive review of the literature corresponding to public drug policy was carried out, finding a total of 22 works in which the relationship between some factors and public drug policies is mentioned.

The following factors for the creation of public drug policies were obtained after a critical review of the works and a count of the mentions: moral values, political ideology, knowledge about empirical evidence, partisan interests, stereotypes and economic interests.

Some dimensions of the variables were also obtained from this review, especially in the works of key authors in the field. Therefore, the choice of dimensions was limited only to studies that explicitly mentioned dimensions for the variables and only those authors who specifically pointed out the relationships between variables and dimensions are mentioned.

Table 2 presents the result of the review of studies of a theoretical or empirical nature on drug policies in Mexico, which are inextricably linked to international treaties and other regulations that bind them to different obligations regarding the drug problem. The dimensions found were the following:

**Table 2**

*Variables and dimensions*

<b>Variables</b>	<b>Dimensions</b>
Moral values.	Religion.
	Tradition.
	Ethics.
Politico ideology	Conservatism.
	Progressivism.
Knowledge about empirical evidence.	Medical and biomedical sciences.
	Social Sciences
Partisan interests.	Bureaucratic.
	Corporate.
	Electoral.
Stereotypes.	Social classes.
	Delinquency.
	Disease.
	Racial.
Economic interests.	Profits from the drug industry.
	Profits from the industry of repression.
	Profits of transnational corporations.

*Note* Own elaboration based on Angelucci, et. al. 2009; Brussino et al. 2011; Del Olmo, 1989; Horminoguez, 2014; Llovera & Scialla, 2016; Lynch, 2012; Paley, 2020; Thoumi, 2002, 2017 and Tokatlian, 2017.

It is necessary to clarify that in the case of the moral values variable, no empirical study was found that supported the dimensions in the specific case of drug policy, so studies from different subjects were used. Regarding the relationship between the moral values variable and public drug policies, the relationship was widely supported by the theory. A similar case occurred with the racial dimension in the Stereotypes variable, since no empirical study was found to support its place as a dimension of the variable, despite the well supported theoretical relationship between race and stereotypes in drug policy. Likewise, the dimension of “ethics” was adapted from the original name of the dimension – “spirituality” – to indicate the meaning indicated by the theory: a strong sense of positivity or negativity towards drugs for reasons of personal ethics. Finally, an empirical study was used to give dimensions to the Political Ideology variable, in which the subject was not public drug policies.

### 3.1. Selection of experts for focus group on weighting of variables

Most of the 26 experts selected to give weight to the variables focus their work on Mexico, even though the nationalities among them are diverse. To limit the number of experts in the field of drug policy, a series of criteria were developed based on the binary system:

- Criterion 1: Academic production in the field of drug policy. One point for those who at the selection cutoff had more than four articles, book chapters, workbooks, or research reports on the topic of drug policy; Zero values assigned to those who did not have at least four productions on the topic.
- Criterion 2: Relevance of the academic work. A value of 1 was given to experts with at least 8 citations in *Google scholar* and a value of zero to those with less than eight citations.
- Criterion 3: Work of experts in the field of drug policy. A point to experts with some distinction – part of research bodies on the subject, institutions in the field, drug policy NGOs –; zero value to experts without this distinction.

The experts chosen for the study accumulated at least 2 points based on the above criteria. Twenty-four experts were contacted by email with the details of the study and the guarantee of confidentiality. Of these, 24 experts agreed to participate in the research and answered two digital questionnaires through *Google Forms*<sup>1</sup>.

Given the fundamental role of weight assignment in the application of Saaty’s algorithm (Saaty, 1987), every effort was made to obtain an adequate number of experts, as well as to develop a simple questionnaire that was completed in an electronic format.

In a certain way, an expert judgment is an opinion poll with the particularity that the opinions come from reliable sources, from authorities on the subject (Mendoza et al., 2019), so the establishment of criteria sought to establish in a way the role of experts as authorities in the field of drug policy as objective as possible.

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1 <https://forms.gle/aaq4CbjxoxX19Hgm6>

### 3.2. Weighting of variables in focus group

From the answers given by the experts to the variable weighting questionnaire, the following stands out:

1. The variables of Economic Interests, Stereotypes and Moral Values had the highest weights.
2. Two variables were indicated by the experts as variables without influence on public drug policies: Knowledge about empirical evidence – mentioned five times – and Moral values – mentioned once.
3. On five occasions, the lack of a variable that described international influence in the process of creating public drug policies was mentioned.

Taking point 3 into account, the International Influence variable was added to the count of influential factors in public drug policies. What was stated in point 2 – the low or null influence of Knowledge on empirical evidence in public drug policies – agrees with the theory, which is why it was not rejected as a variable, to be able to compare it in other estimates or studies dealing with the role of empirical evidence in the creation of public drug policies.

With the results obtained, a total ranking count given by the experts was carried out and the Saaty matrix was filled, resulting in the following (see table 3):

**Table 3**

*Hierarchy of variables by experts*

Expert	Politic ideology	Economic interests	Partisan interests	Knowledge about empirical evidence	Stereotypes	Moral values
1	6	3	5	1	4	2
2	5	6	2	1	3	4
3	4	6	5	1	2	3
4	3	6	4	2	5	1
5	3	2	2	1	6	5
6	3	2	4	1	5	6
7	2	5	3	1	6	4
8	3	6	2	1	4	5
<b>TOTAL</b>	<b>29</b>	<b>36</b>	<b>27</b>	<b>9</b>	<b>35</b>	<b>30</b>

*Note.* Own elaboration based on Saaty (1987).

In descending order, the weightings of the variables were as follows: Economic interests obtained 36 points; Stereotypes, 35; Moral values, 30; Political ideology, 29; Partisan interests, 27 and Knowledge about empirical evidence, 9. To complete the first row of the Saaty matrix, the value given to the highest variable in relation to the others was taken. Thus, values were assigned as follows:

- The Economic Interests variable in relation to the Stereotypes variable has a relationship of 2 since they are one point apart (36 to 35). This intermediate number expresses a relationship of proximity to hierarchy 3 (moderate importance) where experience and judgment narrowly favor one activity in relation to the other.
- The Economic Interests variable compared to the Moral Values variable (36 to 30) was also rated with an intermediate relationship number of 4, a prelude to relationship 5 (moderate importance to strong importance), where experience and judgment strongly favor an activity over another.
- The Economic Interests variable in relation to the Political Ideology variable is marked with the number 5, given the distance between the weights (36 to 29), expressing a strong importance.
- The Economic Interests variable in relation to the Partisan Interests variable (36 to 27) was rated with the number 6, another intermediate number between strong importance and very strong or demonstrated importance where one activity is much more favored than the other.
- The relationship between the variable Economic Interests and Knowledge on empirical evidence was rated with a relationship of 9, given the distance between their weights (36 to 9) to indicate an extreme relationship, in which the evidence clearly favors one activity over the other.

With these weights, the matrix results as follows (see table 4).

**Table 4**

*Saaty matrix for variables*

Focus	Economic interests	Stereo- types	Moral values	Politic ideology	Partisan interests	Knowledge about empirical evidence
Economic interests	1	2	4	5	6	9
Stereotypes	1/2	1	3	4	5	9
Moral values	1/4	1/3	1	2	3	8
Politic ideology	1/5	1/4	1/2	1	2	8
Partisan interests	1/6	1/5	1/3	1/2	1	7
Knowledge about empirical evidence	1/9	1/9	1/8	1/8	1/7	1

*Note.* Own elaboration based on Saaty (1987).

### 3.3. Variable matrix normalization

After assigning weights the matrix was normalized. The final results can be seen in table 5.

**Table 5**

*Normalization of the Saaty matrix for the variables*

Variable	Normalization			Percentage
	1	2	3	
Economic interests	2160	3.59535925	0.3989605	39.90
Stereotypes	270	2.54230291	0.28210768	28.21
Moral values	4	1.25992105	0.13980765	13.98
Politic ideology	0.4000	0.85837422	0.09524984	9.52
Partisan interests	0.03888889	0.58206425	0.064589	6.46
Knowledge about empirical evidence	0.000027557	0.17379589	0.01928533	1.93
<b>TOTAL</b>		9.01181756	1	100

*Note.* Own elaboration based on Saaty (1987).

The specific procedure for normalizing the Saaty matrix (Mercado, 1991) and thus obtaining the values in table 5 is developed below:

1. The values of each of the rows are multiplied. For the first variable economic interests we have:

$$1*2*4*5*6*9 = 2160 \tag{1}$$

Row 1 is made up of the product of this column and the rest.

2. The next step is to obtain the root  $6\sqrt{\phantom{x}}$  of the previous results since there are 6 different alternatives in our matrix. In the case of the Economic Interests variable, the result is the following:

$$\sqrt[6]{2160} = 3.59535925 \tag{2}$$

3. The previous values form column 2. Afterwards, the sum of these values is carried out and the following is obtained:

$$9.01181756$$

4. Normalization column 3 is obtained by dividing the results of column 2 by the sum of the roots. For the Economic Interests variable the following results:

$$3.59535925/9.01181756 = 0.3989605 \quad (3)$$

5. To complete the normalization matrix and obtain the percentage of each variable, the values in column 3 are multiplied by 100. Once again, the results of the Economic Interests variable are presented:

$$0.3989605 * 100 = 39.89605 \quad (4)$$

The three variables with the highest percentage chosen for the second part of the application of the Saaty algorithm corresponding to the dimensions are: economic interests, stereotypes and moral values.

### 3.4. Variable matrix consistency measure

The consistency of the matrix represents an indicator of rational judgment in filling out the Saaty matrix. The procedure to obtain it is as follows:

1. To determine the  $\lambda_{max}$  we must multiply the first Saaty matrix by the results of column 3 of the normalized matrix; The result will be a group of values corresponding to each variable. These values must be added as shown below:

$$2.55975763 + 1.77852321 + 0.87213299 + 0.59893333 + 0.41672873 + 0.13356876 = 6.35964464 \quad (5)$$

The sum represents the  $\lambda_{max}$ .

2. Consistency index (CI) is then calculated for each criterion, where  $n$  is equal to the number of criteria (Mendoza *et. al*, 2019; Mercado, 1991). The formula is expressed in the following terms:

$$CI = \lambda_{\max} - n / n - 1 \quad (6)$$

The substituted formula with its respective values looks like this:

$$CI = (6.35964464 - 6) / (6 - 1) = 0.07192893$$

3. The random index (AI) is then determined, which, according to Mendoza *et al.* (2019) can be calculated by the following expression:

$$IA = 1.98 (n - 2) / n \quad (7)$$

After solving the formula with the substituted values, we arrive to this result:

$$IA = 1.98 (6 - 2) / 6 = 1.32 \quad (8)$$

4. Finally, we establish the consistency ratio (CR) with the equation:

$$CR = CI / IA \quad (9)$$

After solving the formula with the substituted values, we have this result:

$$CR = 0.07192893 / 1.32 = 0.05449161 \quad (10)$$

The consistency ratio is established with a value of 0.05449161, being an acceptable consistency value, since if the consistency rate "...is less or equal to 0.1, the level of inconsistency is acceptable, with an opposite result it is recommended that the expert should review their estimates" (Mendoza *et al.*, 2019, p. 352). This acceptable value expresses that the results are valid, and the weighting is reasonable.

### **3.5. Selection of experts for focus group on weighting dimensions**

To carry out the weighting of dimensions, it was necessary to go to a second group of experts to carry out the corresponding weighting. Although the first group of experts answered both questionnaires (variables and dimensions), it was necessary to go to a second group of experts, given that the Moral Values variable had initially been rejected for the weighting of its dimensions.

In this way, the second weighting of dimensions was used to expand the margin of criteria in the weighting of the second matrix. A new set of criteria was developed for the selection of the new group of experts, consisting of the following points:

- Experts in drug policy who were pursuing a doctorate or recent graduates, who had the topic of drug policy in their research in any of its aspects (safety and health, social development, and education) were selected.
- Experts who have been working on drug policy for at least two years.

For this second group of experts, the binary system was not used, since only two criteria were considered, and all the selected experts met both criteria. The result was that 12 experts were contacted indicating the general principles of the study; Of these 12, 6 experts agreed to participate and answered the questionnaire. The following section details the details of the choice of dimensions and the results of the application of the algorithm.

### **3.6. Weighting of dimensions in focus group**

As mentioned previously, for the weighting of dimensions, the three variables with the highest weighting in our first Saaty matrix were taken, and the International Influence variable, given the number of times it was mentioned as missing in the count. The rest of the variables were left out of this second weighting, since they did not show a significant percentage, being all below 10%.

To give dimensions to the fourth variable, the answers given by the experts to the first questionnaire were used, since the terms: North American influence, US influence and US pressure were mentioned on several occasions when justifying their argument that the variable was missing from the count. Therefore, the term North American Influence was chosen. In the same responses to justify the absence of the fourth variable, the terms of: International drug conventions, International Treaties and Pressure from the UN International Narcotics Control Board were mentioned. In this case, the term International Drug Conventions was chosen to encompass what was mentioned. Taking all of the above into account, the table with the dimensions mentioned is presented (see table 6):



**Table 6**

*Dimensions to be weighted with the Saaty algorithm*

Variable	Dimension
Economic interests	1. Profits from the drug industry 2. Profits from the law enforcement industry 3. Profits of transnational corporations
Stereotypes	4. Social class stereotypes 5. Stereotypes of crime 6. Disease stereotypes 7. Racial stereotypes
Moral values	8. Tradition 9. Ethics 10. Religion
International influence	11. North American influence 12. International drug conventions

*Note.* Own elaboration based on Angelucci, et. al., 2009; Del Olmo, 1989; Llovera & Scialla, 2016; Lynch, 2012; Paley, 2020; and Thoumi, 2002.

This second questionnaire was also applied through the *Google Forms* tool so that the new group of experts could weigh the dimensions. From these weightings the following findings are pointed:

- Regarding dimensions that the experts considered not influential, the Tradition dimension was highlighted three times. Given that this variable corresponds to the variable with the lowest weighting in the dimension analysis, such a result was expected.
- Regarding dimensions that should be added, the dimensions of: Control of social and territorial movement, Political or partisan interests expressed in the political costs of the change from one prohibitionist paradigm to another, and Activism and its role in policy change drug publics, were all expressed on one occasion.

Given the few mentions of dimensions that should be added, it was decided not to add any in this second stage of the study. Regarding the answers given by the second group of experts, these were the results (see table 7):

**Table 7**

*Hierarchy of dimensions by experts*

Expert	1	2	3	4	5	6	7	8	9	10	11	12
1	10	5	6	8	12	9	7	3	2	1	11	4
2	12	6	7	9	10	8	11	1	2	3	5	4
3	12	11	7	4	6	5	2	1	3	10	9	8
4	12	10	11	7	5	4	6	1	3	2	9	8
5	12	11	4	9	8	7	6	2	3	1	10	5
6	6	8	3	11	12	10	9	4	2	1	7	5
<b>TOTAL</b>	64	51	38	48	53	43	41	12	15	18	51	34

*Note.* Own elaboration based on Saaty (1987).

In the same way as the matrix corresponding to the variables was filled out – considering the mentions of the largest dimension compared to the others to assign them a value according to the weighting of the algorithm – the dimension matrix was based on the distances between the Profit dimension of the drug trafficking industry (1), in relation to the others. After assigning these values, the table was filled as shown below (see table 8):

**Table 8**

*Saaty matrix for dimensions*

Focus	1	5	2	11	4	6	7	3	12	10	9	8
1	1	2	3	3	4	5	5	6	7	8	8	9
5	1/2	1	2	2	3	4	4	5	6	7	7	8
2	1/3	1/2	1	2	3	4	4	5	6	7	7	8
11	1/3	1/2	1/2	1	2	3	3	4	5	6	6	7
4	1/4	1/3	1/3	1/2	1	2	2	3	4	5	5	6
6	1/5	1/4	1/4	1/3	1/2	1	2	3	4	5	5	6
7	1/5	1/4	1/4	1/3	1/2	1/2	1	2	3	4	4	5
3	1/6	1/5	1/5	1/4	1/3	1/3	1/2	1	2	3	3	4
12	1/7	1/6	1/6	1/5	1/4	1/4	1/3	1/2	1	2	2	3
10	1/8	1/7	1/7	1/6	1/5	1/5	1/4	1/3	1/2	1	2	3
9	1/8	1/7	1/7	1/6	1/5	1/5	1/4	1/3	1/2	1/2	1	2
8	1/9	1/8	1/8	1/7	1/6	1/6	1/5	1/4	1/3	1/3	1/2	1

*Note.* Own elaboration based on Saaty (1987).

### 3.7. Normalization of the Dimension Array

Also in this matrix, each row was multiplied, and the root was taken depending on the number of observations, which in this case is 12. Then, the total of the roots was added, and each result was divided by that number. With this, the values in column 3 were obtained and multiplied by 100. The results can be observed in table 9.

**Table 9**

*Normalization of the Saaty matrix for the dimensions*

Dimension	Normalization			Percentage
	1	2	3	
1. Profits from the drug industry	43545600	4.33090532	0.24074075	24.074075
5. Stereotypes of crime	1128960	3.19440428	0.1775664	17.75664
2. Profits from the law enforcement industry	188160	2.75133797	0.15293781	15.293781
11. North American influence	7560	2.10479668	0.11699871	11.699871
4. Social class stereotypes	100	1.46779927	0.08159012	8.159012
6. Disease stereotypes	7.5	1.18282848	0.06574953	6.574953
7. Racial stereotypes	0.5	0.94387431	0.05246686	5.246686
3. Profits of transnational corporations	0.006666667	0.65865662	0.03661255	3.661255
12. International drug conventions	0.0000992063	0.46385078	0.02578394	2.578394
10. Religion	0.0000042517	0.35676334	0.0198313	1.98313
9. Ethics	0.000000708617	0.30727999	0.01708068	1.708068
8. Tradition	0.000000019137	0.22741697	0.01264136	1.264136
<b>TOTAL</b>		17.989914	1	100

*Note.* Own elaboration based on Saaty (1987).

### 3.8. Measure of consistency of the matrix of dimensions

Also in this case, the consistency rate is calculated with the following procedure:

1. The original Saaty variable is multiplied by the values in column 3 of the normalized matrix. In this way the  $\lambda_{max}$  is obtained. Once obtained, the values for each variable are added:

$$\begin{aligned}
 &3.13235646 + 2.25272684 + 1.97088237 + 1.46565842 + 1.02025697 + 0.85463353 + 0.65734208 \\
 &+ 0.46030242 + 0.32303743 + 0.2564048 + 0.21676711 + 0.165366 = 12.7757344 \\
 &\lambda_{max} = 12.7757344
 \end{aligned}
 \tag{11}$$

2. We obtain the consistency index (CI) with the formula  $CI = \lambda_{max} - n / n - 1$ .

$$CI = (12.7757344 - 12) / (12 - 1) = 0.07052131
 \tag{12}$$

3. To obtain the value of the random index (AI), we use the formula  $AI = 1.98 (n - 2) / n$ :

$$IA = 1.98 (12 - 2) / 12 = 1.65
 \tag{13}$$

4. We obtain the consistency ratio (CR) using the expression  $CR = CI / IA$ :

$$CR = 0.07052131 / 1.65 = 0.04274019
 \tag{14}$$

The value of the consistency rate is 0.04274019. Also, in this case we find an acceptable level of consistency since it is below 0.1.

The sum of the percentages of the normalization of the dimensions per variable gives us a new percentage belonging to each of the variables. The results obtained are in the table 10.

**Table 10**

*Percentages of variables with their dimensions*

<b>Variable</b>	<b>Dimension</b>	<b>Total</b>
Economic interests	1. Profits from the drug industry: 24.074075 %.	43.029111 %.
	2. Profits from the law enforcement industry: 15.293781 %.	
	3. Profits of transnational corporations: 3.661255 %.	
Stereotypes	4. Social class stereotypes: 8.159012 %.	37.737291 %.
	5. Stereotypes of crime: 17.75664 %.	
	6. Disease stereotypes: 6.574953 %.	
	7. Racial stereotypes: 5.246686 %.	
Moral values	8. Tradition: 1.264136 %.	4.955334 %.
	9. Ethics: 1.708068 %.	
	10. Religion: 1.98313 %.	
International influence	11. North American influence: 11.699871 %.	14.278265 %.
	12. International drug conventions: 2.578394 %.	

*Note.* Own elaboration based on Saaty (1987).

The sums per variable found in this weighting by dimension do not find significant changes with those corresponding to the weighting by variable in the first exercise: the hierarchy of 1. Economic interests, 2. Stereotypes and 3. Moral values is maintained, with the only difference of the insertion of the fourth added variable – International Influence – between positions 2 and 3 of the original hierarchy.

Specifically, the following differences can be found in the percentages:

- Economic Interest variable: increase from 39.90% to 43.029%
- Stereotypes variable: increase from 28.21% to 37.737%
- Moral values variable: decrease from 13.98% to 4.955%

Once again, it is highlighted that the changes in these percentages may be due to the inclusion of the fourth variable of International Influence. However, it is estimated that even with the inclusion of the fourth variable, the results are consistent with the first variable weighting exercise.

#### 4. Discussion

The use of a panel of experts for the selection of alternatives can be found in many studies in which the hierarchical analytical process is chosen as the research methodology. The studies found in this sense range from the determination of methodologies for impact assessment (Delgado & Romero, 2015), obtaining a better understanding of the aspects that affect the road safety of cyclists in their lanes (Ruiz-Padillo *et al.*, 2018), determination of the potential entrepreneurial capacity of students in higher education centers (Cabana-Villca *et al.*, 2013), and even the determination of a weighted value of the importance of sources of operational risk in agriculture (Quirós *et al.*, 2020).

The first cross-sectional study similar to the one presented here is that of Beltrán *et al.* (2009). The work of these authors focuses on the use of techniques in order to obtain a relative weighting between the different variables of a model under study, which aimed at the effectiveness and efficiency of measurement management systems based on the international standard ISO 10012:2003, with satisfactory results.

Without counting on the use of the hierarchical analytical process, and taking into account the panel of experts in studies related to drugs, we find the Delphi methodology of the panel of experts in research on places where higher priority is required in treatment and prevention services of drug use (García *et al.*, 2016) and forecast growth of the drug market (Lintonen *et al.*, 2014).

Focusing on the studies that used a panel of drug policy experts specifically, we have the study by Strang *et al.* (2012), which highlights the effects that evidence-based interventions would have. Finally, the study by Atuesta (2019) brought together a focus group with different profiles: academics, members of civil society organizations, journalists and public officials, with the aim of hearing their opinion regarding the problem of the drug phenomenon and how government policies could be designed to solve the problem.

The present work in relation to the studies that have been carried out on drugs, although the methodology of the hierarchical analytical process is similar to Beltrán *et al.* (2009) in the sense that it seeks to give a weight to the study variables, the methodology itself was designed for multi-criteria decision problems. In addition, the application of questionnaires, the selection process of experts and the filling of the matrix assume their own particularity.

In this sense, it is expected that the study accommodates investigations of this type, in which the independent variables must be revalidated by a panel of experts in the research topic, and in which the relationships between these and the dependent variable can be evaluated through the application of the analytical hierarchical process.

Some authors, such as Atuesta (2014, 2018, 2019); Acevedo (2006); Barra (2013) have examined drug public policies, considering aspects like health, social development, and education, as well as security and justice. This current study distinguishes itself by not solely focusing on these absolute axes but rather viewing them as part of a circular process. This is essential because the existing approach lacks flexibility and needs to be constructed through ongoing dialogue and contributions between officials and the academic sector. These policies should be consistently evaluated to ensure the development of more effective public policies. Ultimately, fostering adaptability and responsiveness in drug public policies is crucial for addressing the dynamic challenges in this complex domain.

The analysis of anti-drug policies is crucial for refining strategies, enhancing their impact, and ensuring that public resources are effectively and efficiently utilized in addressing the complex challenges associated with drug use and trafficking.

## 5. Conclusions

In this work, a study was presented where the factors that determined public drug policies in Mexico during the period 2006-2018 were identified, implementing a method of weighting variables through the Saaty algorithm.

Public drug policies in Mexico were taken as a dependent variable, and in order to assign independent variables and dimensions, two questionnaires were carried out at different times: the first corresponding to the assignment of values for the variables, and the second to the dimensions of the variables resulting from the first study. In order to corroborate the assignment of weights to the variables, 26 experts on the subject of drug policy in Mexico were selected.

The results found here confirm what is established in the literature consulted at the time of setting the objectives of the research. From the academic context, the vision and analysis of public drug policies yields unanimity in estimating the lack of empirical knowledge applied in the design of said policies.

Although the current empirical knowledge applied to the design of public drug policies in Mexico does not guarantee their success, it is at least expected that the existence of a body of specialized studies would greatly influence the designs and provide flexibility to the current measures, responding to advances in the matter.

The criteria of a panel of experts focused on public drug policies in a country, gathered in this study, make an important contribution to understanding the Mexican panorama not only regarding the drug phenomenon in the country, but also in terms of the state of current public drug policies. Studies of a similar nature to the one presented here could clarify other current and emblematic problems of Mexican public policies.

The results obtained show the relevance of the independent variables according to the panel of experts consulted. In first place was the economic interests variable with 43.029111%, then the stereotypes variable with 37.737291%, followed by the international influence variable with 14.278265%, and lastly, the moral values variable with 4.955334%.

By dimensions, it was the profits of the drug trafficking industry with 24.074075% that were located with the highest level of importance not only within the dimensions of the economic interests variable but also of the set of dimensions that make up the variables that determined the public policies of drug trafficking in Mexico during the period 2006-2018. It was followed by the dimensions stereotypes of delinquency –variable stereotypes-, profits from the industry of repression –economic interests- and North American influence –international influence-.

Within the dimensions with less presence in the determination of public drug policies in Mexico, tradition, ethics and religion were located in that order. All dimensions are members of the moral values variable.

Although the bibliography consulted revealed a series of authors who from different areas established the lack of empirical knowledge in current public drug policies, or mentioned some of the variables as influential in public drug policies, this study is a pioneer in the prioritization and inclusion of the factors that would have priority over empirical knowledge in the elaboration of public drug policies in Mexico.

Finally, this research seeks to carry out a novel and critical approach to the nature of public drug policies, in order to reach the conclusion of which factors should have the greatest influence when designing a public drug policy in its different areas.



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