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ANALYSIS OF THE VIOLATION OF THE RIGHT TO WORK IN THE LGTBIQ+ COMMUNITY IN ECUADOR THROUGH NEUTROSOPHICS COGNITIVE MAPS AND TOPSIS

ANÁLISIS DE LA VIOLACIÓN DEL DERECHO AL TRABAJO EN LA COMUNIDAD LGTBIQ+ EN ECUADOR A TRAVÉS DE MAPAS COGNITIVOS NEUTROSÓFICOS Y TOPSIS

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ABSTRACT

Labor markets are accompanied by mechanisms that discriminate and segregate certain groups in society due to their sexual orientation or gender ideology, regardless of the capabilities and potential of individuals. Although there are a large number of laws in several countries that penalize this type of behavior, it is evident that there are problems that bring with them harmful effects for this social segment, both psychological and economic. In the case of the Republic of Ecuador, it is a vanguard nation in the safeguarding of these rights, but there are still, in the opinion of these people, questions to be resolved in this regard. That is why the general objective of this investigation is to analyze the violation of the right to work in the LGTBIQ+ community of the aforementioned nation. In its fulfillment, neutrosophic techniques such as Neutrosophic Cognitive Maps were used to determine the weight of these problems and TOPSIS to find the relationship with each of the effects raised by the members of this community. As a result, it was observed that despite the government's actions in legislative matters, little work is perceived in this sense to protect such rights.

Keywords: right to work, LGTBIQ+ community, NCM, TOPSIS.

RESUMEN

Los mercados laborales están acompañados de mecanismos que discriminan y segregan a ciertos grupos de la sociedad por su orientación sexual o ideología de género, independientemente de las capacidades y potencialidades de los individuos. Aunque existe un gran número de leyes en varios países que penalizan este tipo de conductas, es evidente que existen problemas que traen consigo efectos nocivos para este segmento social, tanto psicológicos como económicos. En el caso de la República del Ecuador, es una nación vanguardista en la salvaguarda de estos derechos, pero aún existen, a juicio de estas personas, cuestiones por resolver en este sentido. Es por ello que el objetivo general de esta investigación es analizar la vulneración del derecho al trabajo en la comunidad LGTBIQ+ de la mencionada nación. En su cumplimiento se utilizaron técnicas neutrosóficas como Mapas Cognitivos Neutrosóficos para determinar el peso de estos problemas y TOPSIS para encontrar la relación con cada uno de los efectos planteados por los miembros de esta comunidad. Como resultado, se observó que a pesar de las acciones del gobierno en materia legislativa, se percibe poco trabajo en este sentido para proteger dichos derechos.

Palabras clave: derecho al trabajo, comunidad LGTBIQ+, NCM, TOPSIS.

INTRODUCTION

Ochoa et al, (2020) states that currently, we live in a society in which obstacles and prejudices are the order of the day, that is, the taboos imposed by society itself become a setback for society. That is why the importance of this theme delves into the identification of the repellence that as a society we create and generate for the rest when they do not adhere to a lifestyle that has been imposed on us throughout history, a man with a woman and vice versa, a society where sexual freedom of people is not allowed, the plurality of gender of people in accordance with what they consider from the most intrinsic of their being.

In the same way, (Arcila-Calderón et al, 2021) declares that in recent years, it is evident how the debate and claim by activist groups and organizations of LGTBQI+ people (lesbians, gays, transgender, transsexuals, bisexuals, intersexuals, queers, and the rest of identities included and growing) has produced advances in a matter of social, economic and political rights achieved in recent decades, making it a pioneer in the recognition of LGTBIQ+ rights. However, despite legislative advances, different studies in the workplace have made visible that gender dissidents still face different forms of discrimination in employment. (Berrocal et al, 2022)

According to (Tubay et al, 2021), in the case of Ecuador, even though it is an emerging issue and that it is part of the priority public policy, the legal instruments designed at the state level in the last ten years do not have the necessary force to transcend the social sands with the expected results. All this happens while the National Constituent Assembly of Ecuador (Ecuador. Asamblea Nacional Constituyente, 2008) declares all the peoples as equal and will enjoy the same rights, duties, and opportunitie, without discrimination. There is no doubt that many times, even though there is adequate legislation, the right to work of this community is violated (Mara et al, 2021; Steiger & Henry, 2020), and it is necessary to determine the problems and the effects that they can cause in this sense (Hossain et al, 2020; Webster et al, 2018). That is why the main objective of this research is to analyze the violation of the right to work in the LGTBIQ+ community in Ecuador. For its fulfillment, the following specific objectives were set up:

1. Determine the causes that are violating this right in the community under study with the help of specialists in the field through interviews.
2. Calculate the weight, as well as the relationship of these problems using Neutrosophic Cognitive Maps (NCM) in order to observe which is the one that most influences the problem.
3. Apply the TOPSIS neutrosophic method to determine the most visible effects associated with the study problems.

The indeterminacy in the responses and considerations of the experts and respondents makes it necessary to develop research on neutrosophic matter. For its realization, an epigraph dedicated to the exposition of materials and methods and another referring to the analysis of its application and discussion were structured. Later, the content of the work is summarized in the form of conclusions and is matched with a body of bibliography.

MATERIALS AND METHODS

Preliminaries

Definition 1: Let X be a space of points (objects) with generic elements in X denoted by x. A single-valued neutrosophic set (SVNS) A in X is characterized by a truth-membership function $T_A(x)$, indeterminacy-membership function $I_A(x)$, and falsehood membership function $F_A(x)$. Then, a SVNS A can be denoted by $A = (x, T_A(x), I_A(x), F_A(x)\ x \in X)$, where $T_A(x), I_A(x), F_A(x) \in [0,1]$ for each point x in X. Therefore, the sum of $T_A(x), I_A(x)$ and $F_A(x)$ satisfies the condition $0 \leq T_A(x), +(x) + F_A(x) \leq 3$. For convenience, a SVN number is denoted by $A = (a\ b\ c)$, where $a, b, c \in [0,1]$ and $a + b + c \leq 3$.

Definition 2: Let $A_1 = (a_1, b_1, c_1)$ and $A_2 = (a_2, b_2, c_2)$ be two SVN numbers, then summation between A_1 y A_2 is defined as follows:

$$A_1 + A_2 = (a_1 + a_2 - a_1a_2, b_1b_2, c_1c_2) \quad (1)$$

Definition 3: Let $A_1 = (a_1, b_1, c_1)$ and $A_2 = (a_2, b_2, c_2)$ be two SVN numbers, then multiplication between A_1 y A_2 is defined as follows:

$$A_1 * A_2 = (a_1a_2, b_1 + b_2 - b_1b_2, c_1 + c_2 - c_1c_2) \quad (2)$$

Definition 4: Let $A = (a, b, c)$ be a SVN number and $\lambda \in \mathbb{R}$ an arbitrary positive real number, then:

$$\lambda A = \left(1 - (1 - a)^{\lambda}, b^{\lambda}, c^{\lambda}\right), \lambda > 0 \quad (3)$$

Definition 5: Let $A = \{A_1, A_2, \ldots, A_n\}$ be a set of n SVN numbers, where $A_j = (a_j, b_j, c_j)\ (j = 1,2, \ldots, n)$. The single value neutrosophic weighted average operator on them is defined by:

$$\sum_{j=1}^{n} \lambda_j A_j = \left(1 - \prod_{j=1}^{n} (1 - a_j)^{\lambda_j}, \prod_{j=1}^{n} b_j^{\lambda_j}, \prod_{j=1}^{n} c_j^{\lambda_j} \right) \quad (4)$$

Where λ_j is the weight of A_j $(j = 1,2,\dots,n)$, $\lambda_j \in [0,1]$ and $\sum_{j=1}^{n} \lambda_j = 1$

Definition 6. Let $A^* = \{A_1^*, A_2^*, \dots, A_n^*\}$ be a vector of n SVN numbers, such that $Aj* = (a_j^*, b_j^*, c_j^*)$ $(j = 1,2,\dots,n)$, and $B_i = \{B_{i1}, B_{i2}, \dots, B_{im}\}$ $(i = 1,2,\dots,m)$, $(j = 1,2,\dots,n)$. Then the separation measure between B_i and A^* based on Euclidian distance is defined as follows:

$$s_i = \left(\frac{1}{3} \sum_{j=1}^{n} \left(|a_{ij} - a_j^*|\right)^2 + \left(|b_{ij} - b_j^*|\right)^2 + \left(|c_{ij} - c_j^*|\right)^2 \right)^{\frac{1}{2}} \quad (i = 1,2,\dots,m) \qquad (5)$$

Next, a scoring function is proposed to classify SVN numbers as follows:

Definition 7: Let $A = (a,b,c)$ be a single-valued neutrosophic number, a score function S of a single-valued neutrosophic value, based on the truth-membership degree, indeterminacy-membership degree and falsity membership degree is defined by:

$$S(A) = \frac{1 + a - 2b - c}{2} \qquad (6)$$

Where: $S(A) \in [-1,1]$

The score function S has reduced the score function proposed by Supciller, A., & Toprak, (2020) if $b = 0$ and $a + b \leq 1$.

A linguistic variable is a variable whose values are characterized by words or sentences instead of numbers in a natural or artificial language. The value of a linguistic variable is expressed as an element of its term set. The concept of a linguistic variable is very useful for solving decision-making problems with complex content. For example, we can express the performance ratings of alternatives on qualitative attributes by linguistic variables such as very important, important, medium, unimportant, very unimportant, etc. Such linguistic values can be represented using single-valued neutrosophic numbers (Leyva-Vázquez et al, 2020; von Feigenblatt et al, 2021). En el caso de la investigación las variables lingüísticas a utilizar se muestran a continuación:

Table 1: Neutrosophic values of the linguistic terms.

Linguistic term	SVNSs
Very Low Influence/ (VLI)	(0.9;0.1;0.1)
No Influence/(NI)	(0.75;0.25;0.20)
Medium Influence/(MI)	(0.50;0.5;0.50)
Influence/(I)	(0.35;0.75;0.80)
Very High Influence/(VHI)	(0.10;0.90;0.90)

2.2. Neutrosophic Cognitive Maps

Starting from the previous elements, in this particular work, the use of Neutrosophic Cognitive Maps (NCMs) is proposed considering the advantages that this technique offers compared to other soft-computing techniques, in terms of interpretability, scalability, aggregation of knowledge, dynamism, and its ability to represent feedback and indeterminacy relationships (Gonzalez et al, 2018). NCMs are an integration of the Fuzzy Cognitive Maps (FCMs) introduced by Kosko in 1986 and the Neutrosophic Sets (NSs) introduced by Smarandache in 1995.

This technique overcomes the inability of traditional FCMs to represent indeterminacy. The inclusion of indeterminacy establishes that neutrality and ignorance are also forms of uncertainty. NCMs constitutes a technique that has received

increasing attention due to their possibilities for representing causality. The following is a set of definitions necessary for working with NCMs.

Definition 1. Let $N = \{(T, I, F): T, I, F \in [0,1]\}$ be a neutrosophic set of evaluation v: is a mapping of a group of propositional formulas into N, i.e., each sentence p is associated with a value in N, as it is exposed in Equation 1, meaning that P is T% true, I% indeterminate, and F% false.

$$v(p) = (T, I, F) \quad (7)$$

Hence, neutrosophic logic is a generalization of fuzzy logic, based on the concept of neutrosophy according to (Alsubhi et al, 2021).

Definition 2. (Martin et al, 2020) Let K be the ring of real numbers. The ring generated by $K \cup I$ is called a neutrosophic ring if it involves the indeterminacy factor in it, where I satisfies $I2 = I, I + I = 2I$ and in general, $I + I + \ldots + I = nI$, if $k \in$, then $k.I = kI, 0I = 0$. The neutrosophic ring is denoted by $K(I)$, which is generated by $K \cup I, i.e., K(I) = < K \cup I >$, where $< K \cup I >$ denotes the ring generated by K and I.

Definition 3. A neutrosophic matrix is a matrix $A = [c]_{ij} = 1, 2, \ldots, m$ and $j = 1, 2, \ldots, n;\ m, n \geq 1$, such that each $a_{ij} \in K(I)$, where $K(I)$ is a neutrosophic ring.

It can observe that an element of the matrix can have the form $a + bI$, where “a” and “b” are real numbers, whereas I is the indeterminacy factor. The usual operations of neutrosophic matrices can be extended from the classical matrix operations.

For example, $\begin{pmatrix} -1 & I & 5I \\ I & 4 & 7 \end{pmatrix}\begin{pmatrix} I & 9I & 6 \\ 0 & I & 0 \\ -4 & 7 & 5 \end{pmatrix} = \begin{pmatrix} -21I & 27I & -6 + 25I \\ -28 + I & 49 + 13I & 35 + 6I \end{pmatrix}$ (8)

Additionally, a neutrosophic graph is a graph that has at least one indeterminate edge or one indeterminate node. The neutrosophic adjacency matrix is an extension of the adjacency matrix in classical graph theory. $a_{ij} = 0$ means nodes i and j are not connected, $a_{ij} = 1$ means that these nodes are connected and $a_{ij} = I$, which means the connection is indeterminate (unknown if it is or if not) (Martin et al, 2020). Fuzzy set theory does not use such notions. On the other hand, if the indetermination is introduced in a cognitive map, as it is referred to, then this cognitive map is called a neutrosophic cognitive map, which is especially useful in the representation of causal knowledge. It is formally described in Definition 4.

Definition 4. A Neutrosophic Cognitive Map (NCM) is a neutrosophic directed graph with concepts like policies, and events, among others, as nodes and causalities or indeterminates as edges. It represents the causal relationship between concepts. The measures described below are used in the proposed model, they are based on the absolute values of the adjacency matrix (Llerena et al, 2021):

Outdegree (v_i) is the sum of the row elements in the neutrosophic adjacency matrix. It reflects the strength of the outgoing relationships (c_{ij}) of the variable:

$$od(v_i) = \sum_{i=1}^{n} c_{ij} \quad (9)$$

Indegree (v_i) is the sum of the column elements. It reflects the strength of relations relationships (c_{ij}) outgoing from the variable.

$$id(v_i) = \sum_{i=1}^{n} c_{ji} \quad (10)$$

Total centrality (total degree (v_i)), is the sum of the indegree and the outdegree of the variable.

$$td(v_i) = od(v_i) + id(v_i) \quad (11)$$

The variables are classified according to the following criteria:

- Transmitting variables are those with $od(v_j) > 0\ e\ id(v_i) = 0$
- The receiving variables are those with $od(v_j) = 0\ e\ id(v_i) > 0$
- Ordinary variables satisfy both $od(v_j) \neq 0\ e\ id(v_i) \neq 0$

The static analysis is applied using the adjacency matrix, taking into consideration the absolute value of the weights. Static analysis in Neutrosophic Cognitive Maps (NCM), initially contains the neutrosophic number of the form $(a + bI)$, where I = indetermination. It requires a process of de-neutrosophication as proposed in (Martín et al, 2020), where $I \in [0,1]$ and it is replaced by their values maximum and minimum. Finally, we work with the average of the extreme values, which is useful to obtain a single value. This value contributes to the identification of the characteristics to be attended, according to the factors obtained, for our case study (Leyva-Vázquez et al, 2020; Muhammad et al, 2021).

$$\lambda([a_1, a_2]) = \frac{a_1 + a_2}{2} \qquad (12)$$

Then,

$$A \succ B \Leftrightarrow \frac{a_1 + a_2}{2} > \frac{b_1 + b_2}{2} \qquad (13)$$

Topsis

In the method, there are k-decision-makers, m-alternatives, and n-criteria. k-decision-makers evaluate the importance of the m-alternatives under n-criteria and rank the performance of the n-criteria with respect to linguistic statements converted into single-valued neutrosophic numbers (Farooq & Saqlain, 2021). Here, the decision-makers utilize often a set of weights such that W = (very important, important, medium, unimportant y very unimportant) and the importance weights based on single-valued neutrosophic values of the linguistic terms are given in Table 1.

On the other hand, the TOPSIS method for SVNS used consists of the following: Assuming that $A = \{\rho_1, \rho_2, \dots, \rho_m\}$ is a set of alternatives and $G = \{\beta_1, \beta_2, \dots, \beta_n\}$ is a set of criteria, the following steps will be carried out:

Step 1: Determine the relative importance of the experts: For this, the specialists evaluate according to the linguistic scale that appears in Table 1, and the calculations are made with their associated SVNN, let $A_t = (a_t, b_t, c_t)$ be the SVNS corresponding to the t-th decision-maker $(t = 1, 2, \dots, k)$. The weight is calculated by the following formula:

$$\delta_t = \frac{a_t + b_t\left(\frac{a_t}{a_t + c_t}\right)}{\sum_{t=1}^{k} a_t + b_t\left(\frac{a_t}{a_t + c_t}\right)} \qquad (14)$$

$$where: \delta_t \geq 0\ and \sum_{t=1}^{k} \delta_t = 1$$

Step 2: Construction of the aggregated single value neutrosophic decision matrix: This matrix is defined by $D = \sum_{t=1}^{k} \lambda_t D^t$, where $= (u_{ij}, r_{ij}, v_{ij})$ and is used to aggregate all the individual evaluations. d_{ij} is calculated as the aggregation of the evaluations given by each expert $(u_{ij}^t, r_{ij}^t, v_{ij}^t)$, using the weights λ_t of each one with the help of equation 7. In this way, a matrix D = $(d_{ij})_{ij}$ is obtained, where each d_{ij} is a SVNN.

Step 3: Determination of the Criteria Weight: Suppose that the weight of each criterion is given by $W = (w_1, w_2, \dots, w_n)$, where w_j denotes the relative importance of the criterion. Si is the evaluation of the criterion λ_t by the t-th expert. Equation 8 is then used to add the w_j^t with the weights λ_t (Muhammad et al, 2021).

Step 4: Construction of the neutrosophic decision matrix of the weighted single values mean with respect to the criteria.

$$D^* = D * W \qquad (15)$$

$$where\ d_{ij} = (a_{ij}, b_{ij}, c_{ij})$$

Step 5: Calculation of the ideal solutions Positive and negative SVNN: The criteria can be classified as cost-type or benefit-type. Let G_1 be the set of benefit-type criteria and G_2 the cost-type criteria. The ideal alternatives will be defined as follows (Saqlain et al, 2020):

The positive ideal solution, corresponding to G_1.

$$\rho^+ = a_{\rho+w}(\beta_j), b_{\rho+w}(\beta_j), ac_{\rho+w}(\beta_j) \qquad (16)$$

The negative ideal solution, corresponding to G_2.

$$\rho^- = (a_{\rho-w}(\beta_j), b_{\rho-w}(\beta_j), ac_{\rho-w}(\beta_j)) \qquad (17)$$

Where:

$$a_{\rho+w}(\beta_j) = \begin{cases} max_i a_{\rho iw}(\beta_j), si\ j \epsilon G_1 \\ min_i a_{\rho iw}(\beta_j), si\ j \epsilon G_2, \end{cases} \qquad a_{\rho-w}(\beta_j) = \begin{cases} min_i a_{\rho iw}(\beta_j), si\ j \epsilon G_1 \\ max_i a_{\rho iw}(\beta_j), si\ j \epsilon G_2, \end{cases}$$

$$b_{\rho+w}(\beta_j) = \begin{cases} max_i b_{\rho iw}(\beta_j), si\ j \epsilon G_1 \\ min_i b_{\rho iw}(\beta_j), si\ j \epsilon G_2, \end{cases} \qquad b_{\rho-w}(\beta_j) = \begin{cases} min_i b_{\rho iw}(\beta_j), si\ j \epsilon G_1 \\ max_i b_{\rho iw}(\beta_j), si\ j \epsilon G_2, \end{cases} \qquad (18)$$

$$c_{\rho+w}(\beta_j) = \begin{cases} max_i c_{\rho iw}(\beta_j), si\ j \epsilon G_1 \\ min_i c_{\rho iw}(\beta_j), si\ j \epsilon G_2, \end{cases} \qquad c_{\rho-w}(\beta_j) = \begin{cases} min_i c_{\rho iw}(\beta_j), si\ j \epsilon G_1 \\ max_i c_{\rho iw}(\beta_j), si\ j \epsilon G_2, \end{cases}$$

Step 6: Calculation of the distances to the positive and negative SVNN ideal solutions: With the help of equations 11 and 12, the following Equations are calculated:

$$d_i^+ = \left(\frac{1}{3} \sum_{j=1}^{n} \left\{ \left(a_{ij} - a_j^+\right)^2 + \left(b_{ij} - b_j^+\right)^2 + \left(c_{ij} - c_j^+\right)^2 \right\} \right)^{\frac{1}{2}} \qquad (19)$$

$$d_i^- = \left(\frac{1}{3} \sum_{j=1}^{n} \left\{ \left(a_{ij} - a_j^-\right)^2 + \left(b_{ij} - b_j^-\right)^2 + \left(c_{ij} - c_j^-\right)^2 \right\} \right)^{\frac{1}{2}} \qquad (20)$$

Step 7: Calculation of the Coefficient of Proximity (CP): The CP of each alternative is calculated with respect to the positive and negative ideal solutions [17].

$$\tilde{\rho_j} = \frac{s^-}{s^+ + s^-} \qquad (21)$$

Where: $0 \leq \tilde{\rho_j} \leq 1$

Step 8: Determination of the order of the alternatives: They are ordered according to what was achieved by $\tilde{\rho_j}$. The alternatives are ordered from greatest to least, with the condition that $\tilde{\rho_j} \rightarrow 1$ is the optimal solution. (Muhammad et al, 2021).

RESULTS AND DISCUSSION

With the help of the National Center for Gender Equality (NCGE), it was possible to obtain, through personal interviews, some of the most relevant problems in the violation of labor law in the LGTBIQ+ community in Ecuador, as well as the possible effects of it on such nation. To have a clearer idea about the dimension of the affectation, it was necessary to take a sample to survey (recalculated by the NCGE in a statistical way for its investigations) and create different groups in search of heterogeneity in the expected results. Figure 1 shows, in a summarized way, the most relevant elements in the development of the investigation.

- Criteria
  - Lack of knowledge of current legislation on Labor Law (P1)
  - Low educational level of employers (P2)
  - Poor government action in the social inclusion of the LGBTQI+ community (P3)
  - Phobias resulting from social exclusion (P4)
  - Low culture of social acceptance (C5)
- Decision groups
  - Transsexual group (342 members) (G1)

- Gay groups (323 members) (G2)
- Bisexual groups (288) members)(G3)
- Transgender group (84 members) (G4)
- Other identities (267 members) (G5)

- Effects
  - Untimely dismissals (E1)
  - Inappropriate or unintended work based on sexual orientation or gender identity (E2)
  - Discrimination based on sexual orientation or gender identity within the workplace (E3)
  - Low economic remuneration (E4)
  - Mistreatment and offenses by employers (E5)

To determine the relationship of the problems mentioned with the effects, it was necessary, previously, to determine their weights through the NCM method exposed in section 2.2. Below is the adjacency matrix (see Table 2) where the different relationships between them were determined, which served as the basis for calculating the values of $od(v_i)$ and $id(v_i)$ (see Table 3). For the development of the method, we had the support of 8 experts from the NCGE where the values of the relationships correspond to their arithmetic mean.

Table 2: Adjacency matrix. Source: own elaboration

Factors	C1	C2	C3	C4	C5	$\sum_{i=1}^{n} c_{ij}$
C1	0	0.6	0.5	I	0.2	1.8
C2	I	0	0.4	0.2	0	1
C3	0.3	1	0	0	I	1.6
C4	0.3	0	0.2+I	0	1	1.9
C5	0	0.33	1	0.5	0	1.83
$\sum_{i=1}^{n} c_{ji}$	1	1.93	2.5	1.2	1.5	

Table 3: Determination of the corresponding values of $od(v_i)$ and $id(v_i)$. Source: own elaboration

	C1	C2	C3	C4	C5	$od(v_i)$
C1	0	0.315789	0.263158	0.263158	0.105263	0.94736842
C2	0.210526316	0	0.210526	0.105263	0	0.52631579
C3	0.157894737	0.526316	0	0	0.157895	0.84210526
C4	0.157894737	0	0.315789	0	0.526316	1
C5	0	0.173684	0.526316	0.263158	0	0.96315789
$id(v_i)$	0.526315789	1.015789	1.315789	0.631579	0.789474	

Once the values were determined, the centrality value $td(v_i)$ was calculated (see Table 4), which was necessary to normalize for later use. The variables were classified as ordinary when being $(v_j) \neq 0\ id(v_j) \neq 0$. In a relevant way, it was possible to observe the deficient actions of the government in the social inclusion of the LGBTIQ+ community, which

turned out to be the problem with the highest incidence in the consideration of the NCGE experts in the violation of the right to work in the community under study.

Table 4: Calculation of centrality $td(v_i)$, normalization of centrality and classification of variables. Source: own elaboration

$td(v_i)$	W_{td_i}	Classification
1.47368421	0.17220172	ordinary
1.54210526	0.1801968	ordinary
2.15789474	0.25215252	ordinary
1.63157895	0.19065191	ordinary
1.75263158	0.20479705	ordinary

In the case of the determination of the effect of the causes exposed previously, the application of the TOPSIS method was necessary. Initially, the weight of the groups of decision-makers established in Figure 1 was determined, the results are shown below:

Table 5: Determination of the weight of the decision-making groups. Source: own elaboration

	Group 1	Group 2	Group 3	Group 4	Group 5
Importance vector λ_t	(0.10;0.90;0.90)	(0.35;0.75;0.80)	(0.35;0.75;0.80)	(0.10;0.90;0.90)	(0.35;0.75;0.80)
Numerical importance	0.1646	0.2236	0.2236	0.1646	0.2236

Subsequently, it was necessary to take into account the consideration of these groups, which were asked to fill out a questionnaire to evaluate problems against effects according to the neutrosophic linguistic scale defined in section 2.1 (see Table 6), which gave way to the elaboration of the single-valued criteria matrix (see table 7). Below is the result of the mode of the rankings of the respondents.

Table 6: Evaluation of the alternatives according to criteria. Source: own elaboration

	Group 1	Group 2	Group 3	Group 4	Group 5
Low economic remuneration					
P1	(0.50;0.5;0.50)	(0.75;0.25;0.2)	(0.50;0.5;0.50)	(0.75;0.25;0.20)	(0.50;0.5;0.50)
P2	(0.9;0.1;0.1)	(0.75;0.25;0.20)	(0.75;0.25;0.20)	(0.9;0.1;0.1)	(0.50;0.5;0.50)
P3	(0.75;0.25;0.20)	(0.9;0.1;0.1)	(0.75;0.25;0.20)	(0.50;0.5;0.50)	(0.35;0.75;0.80)
P4	(0.35;0.75;0.80)	(0.50;0.5;0.50)	(0.9;0.1;0.1)	(0.35;0.75;0.80)	(0.75;0.25;0.20)
P5	(0.9;0.1;0.1)	(0.35;0.75;0.80)	(0.35;0.75;0.80)	(0.9;0.1;0.1)	(0.75;0.25;0.20)
Mistreatment and offenses in workplaces					
P1	(0.75;0.25;0.20)	(0.9;0.1;0.1)	(0.9;0.1;0.1)	(0.75;0.25;0.20)	(0.75;0.25;0.20)
P2	(0.50;0.5;0.50)	(0.75;0.25;0.20)	(0.75;0.25;0.20)	(0.75;0.25;0.20)	(0.50;0.5;0.50)
P3	(0.10;0.90;0.90)	(0.50;0.5;0.50)	(0.9;0.1;0.1)	(0.35;0.75;0.80)	(0.10;0.90;0.90)
P4	(0.50;0.5;0.50)	(0.50;0.5;0.50)	(0.10;0.90;0.90)	(0.10;0.90;0.90)	(0.50;0.5;0.50)
P5	(0.9;0.1;0.1)	(0.75;0.25;0.20)	(0.50;0.5;0.50)	(0.50;0.5;0.50)	(0.9;0.1;0.1)
Untimely dismissals					
P1	(0.75;0.25;0.20)	(0.10;0.90;0.90)	(0.50;0.5;0.50)	(0.75;0.25;0.20)	(0.35;0.75;0.80)
P2	(0.9;0.1;0.1)	(0.50;0.5;0.50)	(0.75;0.25;0.20)	(0.9;0.1;0.1)	(0.75;0.25;0.20)
P3	(0.50;0.5;0.50)	(0.10;0.90;0.90)	(0.10;0.90;0.90)	(0.50;0.5;0.50)	(0.50;0.5;0.50)
P4	(0.9;0.1;0.1)	(0.75;0.25;0.20)	(0.90;0.90;0.50)	(0.10;0.90;0.90)	(0.75;0.25;0.20)
P5	(0.75;0.25;0.20)	(0.75;0.25;0.20)	(0.50;0.5;0.50)	(0.75;0.25;0.20)	(0.9;0.1;0.1)

Employment discrimination based on sexual orientation or gender identity					
P1	(0.9;0.1;0.1)	(0.50;0.5;0.50)	(0.75;0.25;0.20)	(0.9;0.1;0.1)	(0.75;0.25;0.20)
P2	(0.75;0.25;0.20)	(0.50;0.5;0.50)	(0.9;0.1;0.1)	(0.50;0.5;0.50)	(0.9;0.1;0.1)
P3	(0.10;0.90;0.90)	(0.35;0.75;0.80)	(0.35;0.75;0.80)	(0.10;0.90;0.90)	(0.10;0.90;0.90)
P4	(0.35;0.75;0.80)	(0.75;0.25;0.20)	(0.10;0.90;0.90)	(0.75;0.25;0.20)	(0.90;0.90;0.50)
P5	(0.50;0.5;0.50)	(0.75;0.25;0.20)	(0.50;0.5;0.50)	(0.9;0.1;0.1)	(0.50;0.5;0.50)
Inappropriate jobs not intended based on sexual orientation or gender identity					
P1	(0.35;0.75;0.80)	(0.75;0.25;0.20)	(0.9;0.1;0.1)	(0.75;0.25;0.20)	(0.50;0.5;0.50)
P2	(0.75;0.25;0.20)	(0.50;0.5;0.50)	(0.50;0.5;0.50)	(0.9;0.1;0.1)	(0.50;0.5;0.50)
P3	(0.75;0.25;0.20)	(0.50;0.5;0.50)	(0.10;0.90;0.90)	(0.35;0.75;0.80)	(0.35;0.75;0.80)
P4	(0.50;0.5;0.50)	(0.35;0.75;0.80)	(0.75;0.25;0.20)	(0.50;0.5;0.50)	(0.75;0.25;0.20)
P5	(0.50;0.5;0.50)	(0.75;0.25;0.20)	(0.9;0.1;0.1)	(0.75;0.25;0.20)	(0.75;0.25;0.20)

Table 7: Single value criteria matrix. Source: own elaboration

	C1	C2	C3	C4	C5
P1	(0.61796;0.38204;0.35034)	(0.83405;0.16595;0.14669)	(0.518;0.49695;0.46846)	(0.784;0.2159;0.1954)	(0.721;0.285;0.2641)
P2	(0.78411;0.21589;0.19539)	(0.67281;0.32719;0.28544)	(0.7841;0.2158;0.19539)	(0.782;0.2172;0.2094)	(0.657;0.3423;0.3299)
P3	(0.71732;0.29188;0.27155)	(0.54234;0.46857;0.47357)	(0.3496;0.6503;0.65031)	(0.221;0.8295;0.8538)	(0.436;0.5955;0.5885)
P4	(0.67424;0.34147;0.33183)	(0.37184;0.62816;0.62816)	(0.7837;0.353;0.28053)	(0.682;0.5312;0.4317)	(0.611;0.4015;0.3687)
P5	(0.71654;0.3022;0.29591)	(0.77074;0.22926;0.2181)	(0.7621;0.2378;0.21023)	(0.671;0.3286;0.3126)	(0.771;0.2283;0.1992)

Next, the weights of the problems defined by the group of experts were determined (see Table 8). In addition, the weighted aggregate decision matrix was calculated (see Table 9).

Table 8: Vector of criteria weights. Source: own elaboration

	Weight of the criterion
C1	(0.55363;0.45751;0.46262)
C2	(0.68262;0.31738;0.30487)
C3	(0.56289;0.45317;0.44142)
C4	(0.38126;0.65378;0.67023)
C5	(0.6431;0.36581;0.3699)

Table 9: SVNS Aggregate Decision Weighted Matrix. Source: own elaboration

	Criterion 1	Criterion 2	Criterion 3	Criterion 4	Criterion 5
P1	(0.34214;0.66474;0.65086)	(0.56931;0.43069;0.40685)	(0.29197;0.72489;0.70311)	(0.29895;0.72853;0.73467)	(0.46413;0.54655;0.53631)
P2	(0.4341;0.57463;0.56762)	(0.45927;0.54073;0.50326)	(0.44136;0.57123;0.55057)	(0.29845;0.72898;0.73928)	(0.42297;0.58289;0.57777)
P3	(0.39712;0.61586;0.60852)	(0.37018;0.63726;0.63408)	(0.19684;0.80877;0.80466)	(0.0846;0.94097;0.95179)	(0.28084;0.74347;0.74071)
P4	(0.37326;0.64277;0.64092)	(0.2538;0.7462;0.74155)	(0.44114;0.64647;0.5981)	(0.26025;0.83769;0.81259)	(0.393;0.62044;0.60222)
P5	(0.39668;0.62145;0.62163)	(0.5261;0.4739;0.45648)	(0.42903;0.58321;0.55883)	(0.25598;0.76755;0.77332)	(0.49628;0.5106;0.49542)

The results corresponding to the values of the proximity coefficient are shown in Table 10, which served as the basis for determining the ranking of the effects in terms of their influence on the vulnerability of the labor law of the population range under study (see Table 11).

Table 10: Positive and negative ideal values and distances. Source: own elaboration

	Ideal value +	Ideal value -
P1	(0.34212;0.66476;0.65089)	(0.43411;0.57463;0.56762)
P2	(0.25383;0.74617;0.74152)	(0.25383;0.43066;0.40684)
P3	(0.19684;0.80878;0.80467)	(0.19684;0.57123;0.55056)
P4	(0.0846;0.94097;0.95179)	(0.0846;0.72853;0.73467)
P5	(0.28084;0.74347;0.74071)	(0.28084;0.5106;0.6678)

Table 11: Ranking of alternatives according to Coefficient of Proximity (CP). Source: own elaboration

Alternatives	d+	d-	CP	Order
E1	0.422592677	0.341657	0.447049	3
E2	0.430665631	0.3298544	0.433722	4
E3	0.280610858	0.4742874	0.62828	1
E4	0.301344532	0.4173837	0.580725	2
E5	0.423935054	0.2985346	0.413214	5

As a result, it can be seen that discrimination based on sexual orientation or gender identity within the workplace is the main effect of the problems studied within the Ecuadorian LGTBQI + community. Although numerous efforts are made to eliminate or reduce such a problem in the labor sector, it is evident once again that discrimination traits persist within this segment of the population, which affects these people from the economic and social point of view who are considered vulnerable.

CONCLUSIONS

In conclusion, it can be addressed that the problems that most violate the right to work of the LGTBIQ + community in the nation of Ecuador were determined today with the help of specialists from the NCGE. They were weighted using the MCN technique because there were uncertainties in some cases in their comparison. In this last aspect, the results showed that the low action of the government in the social inclusion of the community turned out to be the issue with the highest incidence.

With the above weightings, 5 groups from this community were asked, classified by their sexual orientation or gender identity, to classify the visible effects of these problems in society. The result of the fashion of the classifications was processed using the neutral TOPSIS method, which showed that as an effect of these unfavorable situations, discrimination based on sexual orientation and gender identity persists in the work centers where these people are found in a segment vulnerability of the population in terms of enjoyment of the right to work.

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