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Neutrosophic VIKOR for Proposal of Reform to Article 189 of the Integral Criminal Code in Ecuador

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Abstract. Given that in Ecuador, according to the authors' criteria, the crime of aggravated robbery through the use of substances that affect the volitional, cognitive, and motor capacities, as defined in the Integral Criminal Code, does not have a penalty in accordance with the principle of proportionality between the degree of violation of a right and the severity of the penalty, the objective of this research is to apply the VIKOR method with a neutrosophic approach to determine a proposal to reform Article 189 of the Integral Criminal Code, which establishes a penalty, with greater proportionality to the harm committed. From the application of the method, a compromise solution set was obtained, where the best alternative is to establish a penalty of 7 to 10 years.

Keywords: VIKOR extended method; single-value neutrosophic set; principle of proportionality.

1 Introduction

Every criminal system finds itself in a dilemma between fighting impunity and guaranteeing the rights of persons suspected of having committed a criminal offense. If the guarantees are extreme, a system that never sanctions would be created; if the guarantees are relaxed, the innocent person would end up being condemned. The criminal justice system has to strike a balance between preventing injustices from being tolerated in society and ensuring that there is something like social peace in the fight against crime [1-3].

Criminal law is a system for regulating the coexistence of individuals, and for that reason it must have a subtle symbiosis in which the State's right to punish is curbed, while on the other hand it must maintain the guarantees and protection of the rights of the victim and the accused, that is, as an ambivalent right it must be in a fair environment that reconciles the claims of both parties. The Integral Criminal Code of Ecuador is constantly being improved in the perennial quest for justice, and new criminally relevant behaviors adapted to international norms are being criminalized [4].

One of the guarantees of modern criminal law is that penalties must respect the criteria of proportionality, which requires that the prescriptions for criminal conduct and the imposition of criminal sanctions have a sufficiently close relationship in order to ensure a balance between the magnitude of the harm caused by the criminal conduct and the punishment to be imposed on the perpetrator. Article 76 of the Constitution of the Republic of Ecuador requires that penalties be in accordance with the principle of proportionality, that is, there must be a certain consistent relationship between the degree of violation of a right and the severity of the penalty [1, 5].

According to the doctrine, the crime of robbery is a patrimonial crime of enrichment; these crimes are based on the idea of the unjust enrichment of the active subject at the expense of the damage to the passive subject's property. The crime of robbery can be carried out with force on things or violence on people. Within the crime of robbery, there is a plurality of legal assets that range from freedom, physical integrity, and life [6].

The crime of robbery with intimidation or violence is, by its nature, a complex crime, that is, one that is made up of several actions that may in turn constitute several crimes, regardless of whether they are later punished separately, in accordance with the rules of the concurrence of infractions [7].

In Ecuador, it is commonplace for the active subject to use substances that affect the victim's capacities in order to facilitate the commission of the felony, and as a result of these acts, the victim's personal integrity may be affected, whether temporarily or permanently.

This crime is classified in the Integral Criminal Code [4], in its Article 189, when it is expressed:

Article 189.- Robbery-1. The person who, by means of threats or violence, removes or takes possession of another person's property, whether the violence takes place before the act to facilitate it, at the time it is committed, or after it has been committed to procure impunity, shall be punished with five to seven years' imprisonment.

If the act is carried out using substances that affect the volitional, cognitive, and motor capacities, with the aim of subduing the victim, leaving him in a state of drowsiness, unconsciousness, or defenselessness, or to force him to carry out acts that he would not have carried out consciously and willingly, he shall be sentenced to five to seven years' imprisonment.

In accordance with the foregoing, the authors of this investigation consider that the criminal legislation is not equitable in paragraphs 1 and 3 of Article 189 of the Integral Criminal Code, since paragraph 1 provides for robbery by means of threats or violence, while paragraph 3 establishes the robbery in which substances capable of affecting the victim's motor, cognitive, and volitional capacity have been used to break the victim's will and conscience. However, the penalty of imprisonment is the same for both paragraphs, i.e., from five to seven years. Since a robbery carried out only with threats to the victim does not produce the same effect as a robbery carried out with substances capable of seriously affecting the victim's conscience and will. It is noted that there is no proportionality of the penalty in the third paragraph, since the offense is not in accordance with the penalty.

In an analysis of comparative law, it was found that in the Peruvian experience this issue has been treated with particular severity, which is justified by an exemplary punishment that, according to the doctrine, should have a negative preventive effect. Such is the severity of the crime that Article 189 of the Peruvian Criminal Code [8] considers this conduct to be serious and merits a penalty of no less than twenty and no more than thirty if the crime of robbery is committed:

1. When injury is caused to the physical or mental integrity of the victim. 2. with abuse of the physical or mental incapacity of the victim or through the use of drugs, chemical or pharmaceuticals against the victim.3. If the family or the victim is placed in financial distress. The penalty shall be life imprisonment when the agent acts as a member of a criminal organization or if, as a result of the act, the victim dies or suffers serious physical or mental harm.

Article 344 of Uruguayan criminal law[9] provides that “anyone who, through violence or threats, takes possession of a piece of furniture, removing it from its holder, in order to take advantage of it or make someone else take advantage of it, shall be punished with four to sixteen years in prison. In addition, if permanent injury is caused to the passive subject, the penalty is increased by one third [3]”.

In short, it is believed that the antinomy between the principle of minimum intervention and the growing need for protection in an increasingly complex society must be addressed by cautiously accommodating new forms of crime and increasing, in accordance with the principle of proportionality, the types of conduct that cause the greatest harm to the legal assets protected under the Criminal Code [2, 3, 10].

That is why the objective of the present investigation is the application of the VIKOR method with a neutrosophic approach [11] for the determination of a proposal to reform article 189 of the Integral Criminal Code, which establishes a penalty for the crime of aggravated robbery for the use of substances that affect the volitional, cognitive and motor capacity, with greater proportionality to the damage committed.

2 Materials and methods

This section mainly recalls some basic notions related to neutrosophic, crisp VIKOR method and extended VIKOR method, all of which will be used in the subsequent content of this paper. Also, describes how the extended VIKOR method is applied in determining the penalty for the crime of aggravated robbery.

2.1 Some basic concepts of SVNS

Neutrosophy is a mathematical theory developed by Florentin Smarandache to deal with indeterminacy [12]. It originated from Paradoxism[13], an international movement in science and culture, founded in the 1980s, based on excessive use of antitheses, oxymoron, contradictions, and paradoxes. In 1995, Paradoxism was extended to a new branch of philosophy called Neutrosophy[14], creating different scientific branches, such as: neutrosophic logic [15], neutrosophic set [16], neutrosophic probability and statistics [17], neutrosophic decision methods [18, 19], etc.

It has been the base for the development of new methods to handle indeterminate and inconsistent information as the neutrosophic sets and the neutrosophic logic and, especially, in the problems of decision making [20{Bera, 2017 #205, 21, 22]. The truth value in the neutrosophic set is the following [23]:

Let $N = \{(T, I, F): T, I, F \subseteq [0,1]\}n$, be a neutral evaluation of a mapping of a group of formulas propositional to N, and for each sentence p you have:

$$v(p) = (T, I, F) \quad (1)$$

In order to facilitate the practical application to decision-making problems, the use of single-value neutral sets (SVNS)[24] was proposed, through which it is possible to use linguistic terms, in order to obtain a greater interpretability of the results.

Let X be a universe of discourse, a SVNS A over X has the following form:

$$A = \{\langle x, u_a(x), r_a(x), v_a(x)\rangle : x \in X\} \quad (2)$$

Where

$u_a(x): X \to [0,1], r_a(x): X \to [0,1]\ y\ v_a(x): X \to [0,1]$

with

$$0 \leq u_a(x), r_a(x), v_a(x) \leq 3, \forall\ x \in X$$

The intervals $u_a(x), r_a(x)$ y $v_a(x)$ denote the memberships to true, indeterminate and false from x in A, respectively. For convenience a Single Value Neutrosophic Number (SVNS) will be expressed as A = (a, b, c), where a, b, c ∈ [0.1] and satisfies 0 ≤ a + b + c ≤ 3.

Some operations between SVNS are expressed below:

1. Let $A_1 = (a_1, b_1, c_1)$ and $A_2 = (a_2, b_2, c_2)$ ∈SVNS, the sum between A_1 y A_2 is defined by:

$$A_1 \oplus A_2 = (a_1 + a_2 - a_1 a_2, b_1 b_2, c_1 c_2) \tag{3}$$

2. Let $A_1 = (a_1, b_1, c_1)$ and $A_2 = (a_2, b_2, c_2)$ ∈ SVNS the multiplication between A_1 y A_2 is defined by:

$$A_1 \otimes A_2 = a_1 a_2, b_1 + b_2 - b_1 b_2, c_1 + c_2 - c_1 + c_2) \tag{4}$$

3. The product by a positive scalar $\lambda \in \Re$ positivo with SVNS, A = (a, b, c) is defined by:

$$\lambda A = \left(1 - (1-a)^{\lambda}, b^{\lambda}, c^{\lambda}\right) \tag{5}$$

4. Let $\{A_1, A_2, \dots, A_n\} \in$ SVNS(x), where $A_j = (a_j, b_j, c_j)$ (j = 1, 2, …, n), then, the Single Valued Neutrosophic Weighted Average Operator is defined by [25]:

$$P_w(A_1, A_2, \dots, A_n) = \langle 1 - \prod_{j=1}^{n}\left(1 - T_{A_j}(x)\right)^{w_j}, \prod_{j=1}^{n}\left(I_{A_j}(x)\right)^{w_j}, \prod_{j=1}^{n}\left(F_{A_j}(x)\right)^{w_j}\rangle \tag{6}$$

Where:

$w = (w_1, w_2, \dots, w_n)$ is vector of $A_j (j = 1,2, \dots, n)$ such that $w_n \in [0,1]$ y $\sum w_j = 1$.

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

$$S(A) = \frac{1 + a - 2b - c}{2} \tag{7}$$

Where

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

2.2 The VIKOR method

The VlseKriterijumska Optimizacija I Kompromisno Resenje (VIKOR) method was presented by [26]. The initial idea of the model is to establish a ranking according to distances in relation to an ideal scenario. The VIKOR method has as its virtue, to ponder the importance of distances in relation to the ideal and best performance scenarios in a potential criterion of the analyzed alternative.

The method is based on the function of the Commitment Programming Method described by Yu and Zeleny [27, 28] .

Assuming as notation the set of alternatives A defined as $a_1, a_2, \dots, a_n$ where for alternative i, the standardized value of its evaluation in criterion j is given by f_{ij}. Thus, we can define the compromise function as [11]:

$$L_{p,i} = \left\{\sum_{j=1}^{m}\left[\frac{w_j\left(f_j^* - f_{ij}\right)}{\left(f_j^* - f_j^-\right)}\right]^p\right\}^{\frac{1}{p}} \tag{8}$$

Where: $1 \leq p \leq \infty$ and $i = 1, 2, \dots, n$ assuming that j denotes a specific criterion and that m is the number of criteria used in the model. Also, f_j^* is the best result obtained for criterion j and that f_j^- is the worst result obtained for criterion j.

Initially the VIKOR method constructs two scores used for the ranking, S and R. The construction of these scores is linked to the compromise function, where to construct S is assumed $p = 1$ and for R is assumed $p = \infty$. This way it is possible to obtain them:

$$S_i = \sum_{j=1}^{m} \frac{w_j\left(f_j^* - f_{ij}\right)}{\left(f_j^* - f_j^-\right)} \tag{9}$$

And still:

$$R_i = \max_j \left[\frac{w_j\left(f_j^* - f_{ij}\right)}{\left(f_j^* - f_j^-\right)}\right] \tag{10}$$

Where w_i are the weights of the criteria, denoting their relative importance.

Then calculate the Q_j values for $j = 1, 2, \dots, m$ applying equation:

$$Q_i = v\left(\frac{S_j - S^+}{S^- - S^+}\right) + \frac{(1-v)(R_j - R^+)}{(R^- - R^+)}$$

Where:

$S^+ = \min_j S_j$, $S^- = \max_j S_j$

$R^+ = \min_j R_j$, $R^- = \max_j R_j$

And v is the weight, which determines the decision-making strategy of the maximum group utility, usually it is fixed as 0.5.

Finally, after ranking the alternatives by sorting each S, R and Q values in the decreasing order, the alternative A_{j1} corresponding to $Q_{[1]}$ (the minimum value among Q_j) as a compromise solution is selected, if the following condition are satisfied:

Condition 1. The alternative A_{j1} has an acceptable advantage in the case, if $Q_{[2]} - Q_{[1]} \geq DQ,$ where $DQ = \frac{1}{(m-1)}$ and m is the number of the alternatives.

Condition 2. The alternative A_{j1} is stable within the decision-making framework, if this alternative has the best ranking in S and/or R.

In the case when one of this conditions is not satisfied, then a set of the compromise solutions is created. This set consist of:

Alternatives A_{j1} and A_{j2}, where $A_{j2} = Q_{[2]}$ when the condition 2 is not satisfied.

Alternatives $A_{j1}, A_{j2}, \ldots, A_{jk}$ when the condition 1 is not satisfied and $A_{jk} = Q_{[k]}$ with the maximum value, which still satisfied the equation $Q_{[k]} - Q_{[1]} \geq DQ$.

2.3 VIKOR method under environment of a single valued neutrosophic set (VIKOR-SVNS)

The extended VIKOR method, is achieved with the application of single value neutrosophic sets to model the information for the decision making problem [11, 29]. All initial information for the solution of the decision-making problem is expressed by the interval-valued neutrosophic numbers. This information includes a description of the importance of the decision-makers, individual expert evaluations regarding the ratings of alternatives via attributes and attribute weights[30-32].

The extended VIKOR method of decision support can be described according to the following steps:

Step 1. Determine the importance of the experts. In the case when the decision is made by a group of experts (decision makers), first, the importance or share to the final decision of each expert is determined. The experts are evaluated according to the linguistic scale shown in table 1, and the calculations are made with their associated SVNS[24].

Linguistic Term	Evaluation	SVN Numbers
Extremely High	EH	(1; 0; 0)
Very Very High	VVH	(0.9, 0.1, 0.1)
Very High	VH	(0,8; 0,15; 0,20)
High	H	(0.70,0.25,0.30)
Medium High	MH	(0,60; 0,35; 0,40)
Medium	M	(0,50; 0,50; 0,50)
Medium Low	ML	(0,40; 0,65; 0,60)
Low	L	(0.30,0.75,0.70)
Very Low	VL	(0,20; 0,85; 0,80)
Very Very Low	VVL	(0.10,0.90,0.90)
Extremely Low	EL	(0; 1; 1)

Table 1 Linguistic terms used for expert's evaluation.

Call $A_t = (a_t , b_t , c_t)$ the SVNS corresponding to the t-th decision-maker (t = 1, 2,..., k). The weight is calculated by the following formula:

$$\lambda_t = \frac{a_t + b_t\left(\frac{a_t}{a_t + c_t}\right)}{\sum_{t=1}^{k} a_t + b_t\left(\frac{a_t}{a_t + c_t}\right)} \quad (11)$$

Where:

$\lambda_t \geq 0$ y $\sum_{t=1}^{k} \lambda_t$=1

Step 2. Each decision-maker performs his evaluations concerning the ratings of the alternatives with respect to the attributes and the attributes' weights. For the assessment of the alternatives by each expert we used the linguistic terms shown in table 2.

Linguistic Term	Evaluation	SVNS
Extremely Important	(EI)	(1.00, 0.00, 0.00)
Very Important	(VI)	(0.9, 0.1, 0.1)
Important	(I)	(0.75,0.25,0.2)
Medium	(M)	(0.5,0.5,0.5)
Low-Important	(LI)	(0.35,0.75,0.8)
Not Very Important	(NVI)	(0.1,0.9,0.9)
Not Important at all	(NI)	(0.00, 1.00, 1.00)

Table 2. Linguistic terms and its SVNS

The neutrosophic decision matrix is defined by $D = \sum_{t=1}^{k} \lambda_t \, d_{ij}$, where $d_{ij} = \left(u_{ij}, r_{ij}, v_{ij}\right)$ is used to aggregate all individual assessments.

d_{ij} is calculated as the aggregation of the evaluations given by each expert $\left({u_{ij}}^t, {r_{ij}}^t, {v_{ij}}^t\right)$, using the weights of each one with the help of Equation 6.

In this way a matrix D = $\left(d_{ij}\right)_{ij}$, where each d_{ij} is a SVNS (i = 1,2,.., m; j = 1,2,…, n).

Step 3. Determination of the Weight of the Criteria [7].

Suppose that the weight of each criterion is given by $W = (w_1, w_2, \ldots, w_n)$,where w_j it denotes the relative importance of the criterion β_j. If $w_j^t = a_j^t, b_j^t, c_j^t$it is the evaluation of the criterion $\beta_j$by the t-th expert. Then, Equation 6 is used, to add the w_j^t the weights λ_t.

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

$$D^* = D \otimes W, where\ d_{ij}^* = W_j \otimes d_{ij} = \left(a_{ij}, b_{ij}, c_{ij}\right) \quad (12)$$

Step 5. Determine the positive and negative ideal solutions for the criteria applying the following equation

The criteria can be classified as either cost-type or benefit-type. Let L_1 be the set of benefit-type criteria and L_2 the cost-type criteria. The ideal alternatives will be defined as follows:

$$\rho^+ = \left(a_{\rho^+w}(\beta_j), b_{\rho^+w}(\beta_j), c_{\rho^+w}(\beta_j)\right) \quad (13)$$

Denotes the positive ideal solution, corresponding to L_1 .

$$\rho^- = \left(a_{\rho^-w}(\beta_j), b_{\rho^-w}(\beta_j), c_{\rho^-w}(\beta_j)\right) \quad (14)$$

Denotes the negative ideal solution, corresponding to L_2.

Where

$$a_{\rho^+w}(\beta_j) = \begin{cases} max_i a_{\rho_i w}(\beta_j), if\ \ j \in L_1 \\ min_i a_{\rho_i w}(\beta_j), if\ \ j \in L_2 \end{cases}$$

$$b_{\rho^+w}(\beta_j) = \begin{cases} min_i b_{\rho_i w}(\beta_j), if\ \ j \in L_1 \\ max_i b_{\rho_i w}(\beta_j), if\ \ j \in L_2 \end{cases}$$

$$c_{\rho^+w}(\beta_j) = \begin{cases} min_i c_{\rho_i w}(\beta_j), if\ \ j \in L_1 \\ max_i c_{\rho_i w}(\beta_j), if\ \ j \in L_2 \end{cases}$$

And

$$a_{\rho^-w}(\beta_j) = \begin{cases} min_i a_{\rho_i w}(\beta_j), if\ \ j \in L_1 \\ max_i a_{\rho_i w}(\beta_j), if\ \ j \in L_2 \end{cases}$$

$$b_{\rho^-w}(\beta_j) = \begin{cases} max_i b_{\rho_i w}(\beta_j), if\ \ j \in L_1 \\ min_i b_{\rho_i w}(\beta_j), if\ \ j \in L_2 \end{cases}$$

$$c_{\rho^-w}(\beta_j) = \begin{cases} max_i c_{\rho_i w}(\beta_j), if\ \ j \in L_1 \\ min_i c_{\rho_i w}(\beta_j), if\ \ j \in L_2 \end{cases}$$

Step 6. Once the ideal values are calculated, S_i , R_i and Q_i, are calculated with the formulas (15), (16) and (17), respectively:

$$S_i = \sum_{j=1}^{m} \frac{w_j\left(\rho^+ - d_{ij}^*\right)}{(\rho^+ - \rho^-)} \quad (15)$$

$$R_i = \max_j \left[\frac{w_j\left(f_j^* - d_{ij}^*\right)}{(\rho^+ - \rho^-)}\right] \quad (16)$$

$$Q_i = v\left(\frac{S_j - S^+}{S^- - S^+}\right) + \frac{(1-v)(R_j - R^+)}{(R^- - R^+)} \quad (17)$$

Where:

$S^{+} = \min_{j} S_j$, $S^{-} = \max_{j} S_j$

$R^{+} = \min_{j} R_j$, $R^{-} = \max_{j} R_j$

And v is the weight, which determines decision making strategy of the maximum group utility.

Step 8. According to VIKOR method, the best alternative must has the minimum Q_j and it can be chosen as a compromise solution. For the selection of the minimum Q_j the rules, presented in the section 2.1, are applied.

3 Results

In order to determine the corresponding penalty to be applied for the crime of aggravated robbery for the use of substances that affect a person's volitional, cognitive, and motor capacity, through the extended VIKOR method, 50 law professionals from Los Ríos, Cantón Babahoyo, were consulted, and they are considered specialists in criminal law. Of these, 28 are free-lance lawyers, 13 are public prosecutors and 9 are judges.

All of them were first asked what penalty they considered should be established for the crime of robbery when substances that could affect the victim(s)' volitional, cognitive, and motor capacities have been used, and they mentioned what criteria they followed for their response. Based on the most frequent responses, alternative decisions were determined in this case, which would be given by the possible penalties to be applied:

1. Between 5 and 7 years (maintaining the current penalty).
2. Between 6 and 8 years.
3. Between 7 and 10 years.
4. Between 8 and 11 years.

The consulted experts also considered that the criteria to be taken into account for the decision to choose would be the following:

1. Compliance with the principle of proportionality of the penalty with the crime committed
2. Social impact on persuasion not to commit the crime.

Once completed steps 1 and 2, the neutrosophic decision matrix of unique aggregated values is obtained as shown in table 3.

Strategy	Criterion 1	Criterion 2
1	(0,733 ; 0,261 ; 0,282)	(0,771 ; 0,228 ; 0,263)
2	(0,719 ; 0,271 ; 0,298)	(0,698 ; 0,358 ; 0,361)
3	(0,745 ; 0,264 ; 0,306)	(0,721 ; 0,267 ; 0,288)
4	(0,697 ; 0,342 ; 0,356)	(0,742 ; 0,235 ; 0,259)

Table 3. Neutrosophic decision matrix of unique aggregated values

With the weight that the experts assigned to each criterion (step 3), the weight of the criteria expressed in SVNS was calculated (table 4).

Criterion	Weight (SVNS)
1.- Compliance with the principle of proportionality of the penalty with the crime committed.	(0,853 ; 0,137 ; 0,162)
2.- Impacto social en la persuasión a no cometer el delito	(0,782 ; 0,212 ; 0,218)

Table 4. Weight of the criteria

Then, the neutrosophic decision matrix of the weighted mean of single values with respect to the criteria (step 4) was constructed, as shown in table 5.

Strategy	Criterion 1	Criterion 2
1	(0,626 ; 0,363 ; 0,398)	(0,603 ; 0,391 ; 0,424)
2	(0,614 ; 0,371 ; 0,412)	(0,546 ; 0,494 ; 0,501)
3	(0,635 ; 0,365 ; 0,418)	(0,564 ; 0,422 ; 0,443)
4	(0,594 ; 0,433 ; 0,46)	(0,581 ; 0,397 ; 0,421)

Table 5. Weighted aggregate decision matrix.

The ideal positive and negative SVNS solutions calculated in step 5 are shown in table 6.

Criterion	Positive Ideal Value (ρ^{+})	Negative Ideal Value (ρ^{-})
1	(0,635 ; 0,363 ; 0,398)	(0,594 ; 0,433 ; 0,46)

2	(0,603 ; 0,391 ; 0,421)	(0,546 ; 0,494 ; 0,501)

Table 6. SVNS positive and negative ideal solutions by criteria.

Finally, values of S_i , R_i and Q_i, calculated by equations (15), (16) and (17) are shown in table 7.

Strategy	S	S Ranking	R	R Ranking	Q	Q Ranking
1	-0,192386404	1	0	1	0,5	3
2	-1,562871007	3	0,191308756	4	0,368089358	2
3	-0,455030698	2	0,132487103	3	0,224276756	1
4	-2,054005833	4	0,075347667	2	0,803073134	4

Table 7. Values of *S*, *R* and *Q* for each strategy

After selection of the minimum Q_j rules were applied, it can be said that the ranking of the alternatives in descending order according to Q, can be expressed as $A_4 \succ A_1 \succ A_2 \succ A_3$ but it is necessary to take into account the fact, that alternatives A_3 , A_2 and A_1 are close to each other and these alternatives must be included into the compromise solution set.

From this it can be concluded that the consulted experts consider with certain preference that, according to the criteria analyzed, a penalty of between 7 and 10 years should be applied to the crime of aggravated robbery through the use of substances that affect a person's volitional, cognitive and motor capacity.

Conclusions

An amendment to the current definition of the crime in Article 189 (3) of the Integral Criminal Code, which refers to the punishment for aggravated robbery through the use of substances that affect a person's volitional, cognitive, and motor capacities, should be considered, since it does not comply with the principle of proportionality of the crime and the penalties established in the code itself and in the Constitution of the Republic of Ecuador.

With the application of the neutrosophic VIKOR technique, four alternatives were evaluated based on the criteria of compliance with the principle of proportionality of the penalty with the crime committed and the social impact on the persuasion not to commit the crime.

As a result, it was found a compromise solution set, where the major alternative is to establish a penalty of 7 to 10 years.

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