University of New Mexico

Neutrosophic Analysis of the Judging of Contraventions Committed in Indigenous Justice

Raúl Clemente Ilaquiche Licta[1], Felipe Alejandro Garcés Córdova[2], Luis Ramiro Ayala Ayala[3] and Kleber Eduardo Carrión León[4]

[1] Universidad Regional Autónoma de Los Andes, Matriz Ambato. Ecuador. E-mail: pg.raulcil43@uniandes.edu.ec
[2] Universidad Regional Autónoma de Los Andes, Extensión Quevedo. Ecuador. E-mail: uq.felipegc09@uniandes.edu.ec
[3] Universidad Regional Autónoma de Los Andes, Sede Riobamba. Ecuador. E-mail: ur.luisayala@uniandes.edu.ec
[4] Universidad Regional Autónoma de Los Andes, Sede Santo Domingo. Ecuador. E-mail: us.klebercarrion@uniandes.edu.ec

Abstract. The pronouncement of Ecuador as a plurinational state implies the recognition of the rights of indigenous peoples and other ethnic groups that live in the country. This fact represents a challenge for the legal sciences since mechanisms must be found to allow the harmonious functioning of ordinary and indigenous justice, in which there are associated difficulties. Like any phenomenon of practical life, it contains a part of uncertainty in the processed information, which can be taken into account with the application of Neutrosophy. The objective of the investigation is the neutrosophic analysis of the judgment of the contraventions committed in indigenous justice. To meet the objective, theoretical and empirical methods were used. Surveys were applied to 110 students of the law career, and the main difficulties associated with the judgment of indigenous justice were identified. Four professors were selected for the application of the neutrosophic soft set model, obtaining as a result the hierarchy of the difficulties encountered and the level of relevance of each one. The most relevant is the lack of an adequate legal framework that allows the organic application of ordinary and indigenous justice without duplication of sanctions.

Keywords: indigenous justice, neutrosophic soft set, neutrosophy.

1 Introduction

Ecuador is a plurinational country, where several nationalities and indigenous peoples coexist, as well as Afro-Ecuadorian and white mestizo peoples, each of them with very particular socio-cultural characteristics. However, for decades the Ecuadorian State has undervalued and ignored the cultural power of the towns [1]. The administration of indigenous justice is neither superior nor inferior to the form of ordinary justice. It is rather different, but it can coexist and develop within the framework of mutual respect, recognition, and appreciation [2].

The subject of indigenous justice is not new, but studies can still be carried out to delve deeper into it. Indigenous justice is not a group of written normative statements that allow or prohibit some conduct, but are oral ancestral practices, based on their own philosophies of life; for example, respect for nature and maintaining order in the environment where they live [3]. Certain constitutions, including that of Ecuador, recognized collective rights and special rights of indigenous peoples, for which it became a State with a plurality of legal systems.

Within the current Constitution of the State, Indigenous Justice is recognized, this is the power of the indigenous communities, to apply their norms of justice, as long as they do not violate human rights or affect the validity of other legal provisions. Given this fact, there are challenges for legal sciences, and solutions must be sought to new legal problems of this nature. Among them, the interpretation of principles that are enshrined in the Constitution and its link with the indigenous justice system, achieving a balance between maintaining compliance with fundamental human rights and autonomy in the application of its laws [4].

The current situation of indigenous justice is highly debated since some members of society consider that this justice is a violent practice to try to stop crime, but the root of the conflict lies in the lack of a procedure for the Judgment of the contraventions in the administration of indigenous justice, which causes a conflict with ordinary justice since, in the penal system, the sanction imposed on the sentenced person is prison, confinement and a fine according to the crime. In the case of indigenous people, they are sanctioned with physical punishment, community work, and fines, among others, since they do not think that being deprived of liberty is a way to regenerate the criminal and reintegrate him into society [5].

Indigenous justice is recognized as a multicultural, multiethnic manifestation, to promote intercultural coexistence of the country's peoples and communities, multilingual, where there must be clear rules on how to carry out the trial and the corresponding sanctions and every type of uncertainty must be avoided within this type of justice [6].

In the current context, it is necessary to recognize the rights of minorities, to avoid that multiple cultures are not visible and that the worldview they possess is violated. For this reason, it is useful to confirm, through the

analysis of the existing theory, if these concepts have effectively transcended their legal fulfillment. Or if they have simply been limited to a doctrine, which is an aspiration, but lacks effective applicability in legal development, carried out by countries that recognize multiculturalism and legal pluralism.

In the Ecuadorian Constitution, Article 10, it is stated that: persons, communities, peoples, nationalities, and groups are holders and will enjoy the rights guaranteed in the Constitution and international instruments. In this context, a group of collective rights is recognized, among which are the right of the authorities of indigenous peoples to exercise jurisdictional functions, based on their own or customary law.

Article 171 states that: the authorities of the indigenous communities, peoples, and nationalities shall exercise jurisdictional functions, based on their ancestral traditions and their own law, within their territorial scope, with the guarantee of women's participation and decision. The authorities will apply their own rules and procedures for the resolution of internal conflicts, and that is not contrary to the Constitution and human rights recognized in international instruments [7].

For indigenous communities, the conceptualization of Law is understood as a set of regulatory norms of life in society, it becomes an ancestral way since the Quichua language knows the law as kamachik. There are 3 basic principles of Quichua culture and justice: not to be idle (ama quilla), not to lie (ama llulla), and not to steal (ama shua). Among the rights that must be preserved in indigenous processes are the right to defend oneself either personally or through third parties, compliance with the principles, norms, and rules with fairness and impartiality, that torture is not carried out, that there is no slavery, no cruel treatment, and no physical or psychological aggression.

Multiculturalism, like legal pluralism, are recently developed doctrines that tend to protect minority cultures, it is for this reason that we must study and analyze them, and it is necessary for those interested in law to understand the impact of the existence of these in the legal field. As with almost all the phenomena that occur in practical life, its analysis and interpretation cannot be rigid, but must also consider the uncertainty in each fact.

In practice, many more situations are observed, which for various reasons include a portion of indeterminacy and uncertainty in the information, making it uncertain and not unique, but hesitant or alternative [8]. To include qualitative research, this quantitative character of uncertainty, the discipline known as Neutrosophy arises. Neutrosophy, and specifically the Soft Set, has numerous applications to real life, among which are the legal and social sciences.

Neutrosophy arises to deal with decision-making problems that involve human knowledge, which frequently have uncertainty, indeterminacy, and inconsistency in information. This is a tool to represent those inconsistencies and contradictions that undoubtedly exist in the processing of evidence within the social sciences and everyday life [9]. The Classic Soft Set is based on a certain function (whose values are certain and unique), they were made known with the investigations carried out by Professor Molodtsov in 1999 [10], then the studies were extended, giving way to talk of the Neutrosophic Soft Set in 2013.

The Neutrosophic set was initially approached by Professor Florentin Smarandache, this is a novel tool to characterize uncertain information in a more sufficient and precise way while allowing to represent the information in a more complete and real way, which admits and encompasses not only truth or falsehood but also ambiguity, ignorance, contradiction, neutrality, and saturation [11].

Neutrosophic sets are characterized by a truth membership function (t), an indeterminacy membership function (i), and a falsehood membership function (f) independently, which lie within the standard real unit interval [−0, 1+] standard or not standard [12, 24]. There is not always total certainty in the information that is worked on, since there may be several points of view that sometimes may even be contrary, lack of information, or that it is incomplete due to various causes, the lack of witnesses, the hesitant opinion of one of the factors involved in the process, among other reasons [13].

When triads of truth values are assigned to the possible values of the obtained sets, meaning membership, non-membership, and indeterminacy, soft set theory is combined with that of neutrosophic sets to obtain greater precision in the results [14], [20], [22], [26], [27], [28]. This situation can be modeled by operators that have some degree of indeterminacy due to the imprecision that exists in the world. Taking into account what has been analyzed up to here, the neutrosophic analysis of the judging of contraventions committed in indigenous justice is proposed as the objective of the investigation, for which the following specific objectives are defined:

1.1 Identify the main existing problems in the topic addressed.
1.2 Carry out a neutrosophic analysis of the problems defined through a Soft Set model.

2   Materials and methods

2.1 Theoretical methods

2.1.1. Synthetic analytical method: the analytical method allowed the decomposition of the whole into specific aspects to understand the structure; which makes it easier to observe and better understand

the components. In this context, this method implies synthesis, that is, the union of dispersed elements to form a total component.

2.1.2. Deductive inductive method: this research method allows for logical reasoning. While the inductive method starts from specific premises to reach general aspects, the deductive method is the opposite, since it starts from the generic until reaching the particular aspects. However, both methods are essential in the construction of knowledge.

2.1.3 Logical historical method: these methods allow the construction of the investigation from the historical elements that are part of the investigation to understand its essential elements and its historical evolution.

2.2 Empirical methods

2.2.1. Interviews: will be applied to the sample made up of selected experts. Structured interviews were prepared in order to obtain information on the real problem and issue possible solutions, to reach valid conclusions, and support the results.

Sample's size calculation:
$$n = \frac{Z2*P*Q*N}{(N-1)E2+Z2*P*Q} \qquad (1)$$
N = sample.
N = population universe
E = maximum admissible error.
Z: Critical value corresponding to a confidence coefficient with which the investigation is to be carried out.
P: Population proportion of occurrence of an event
E: Sample error (difference between statistical and parametric)

2.2.2. Observation: to check how the phenomenon under investigation behaves.

2.2.3. Surveys: a survey was developed and applied to people from the interest group.

2.2.4. Information processing methods: General Problem Solving Method (GPSM)

The depth of the application of this method lies in [15], however, in summary, it is stated that the first step in solving a problem consists in understanding it. Surely it is a truism to say that it is impossible to solve a task without prior understanding of it, but understanding a problem does not only mean understanding the words, language, or symbols in which it is raised but also assuming the situation as such a problem and acquire a readiness to search for that solution. [16, 17, 25]

Generally, for a situation to be considered a problem, one must be aware that a new situation exists or that there has been a change with respect to some previous situation, or that it is a task for which there is only one insufficient explanation. Understanding a problem implies realizing the difficulties and pitfalls that a task presents and the willingness to try to overcome them. For this understanding to occur, it is, of course, necessary that in addition to the novelty elements, the problem contains already-known aspects that guide the search for a solution. [21].

Once the problem has been understood, a plan must be devised to help solve it. It should be considered what is the distance between the situation from which one starts and the goal to which one intends to reach and what procedures are the most useful to reduce this distance. The success of a strategy will depend both on the way it fits into the structure of the task, and on the presence of specific rules, algorithms, and operators; in a word, of techniques that contribute to the subject effectively developing his plans. For its application, the following stages must be executed:
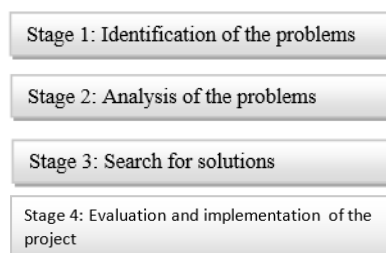

Figure 1. Representation of the stages of the GPSM. Source: own elaboration.

2.3 Neutrosophic Soft Set

Let U, be a universe of situations, H a non-empty subset of U, and $P(H)$ the power function of H. Let a be an attribute and A a set of these attribute values.

A function $F: A \rightarrow P(H)$ is called an indeterminate or soft function if:

    i.   the set A has some indeterminacy;

    ii.   or $P(H)$ has some indeterminacy;

    iii.   or there is at least one attribute value $v \in A$, such that F(v) = *indeterminate* (unclear, uncertain, or not unique);

    iv.   or two or the three previous situations.

The Neutrosophic Soft Set is defined as the Soft Set where F (perhaps) or F (indeterminate), etc, is roughly equivalent to F (yes), F (no), F (true), or F (false), associated with a triad of values (α, β, γ), where $(\alpha, \beta, \gamma) \in [0,1]^3$ mean the degrees of truth, indeterminacy, and falsehood, respectively [18], [19], [23].

From the previously discussed, the following neutrosophic triplet can be formed [16]:

    i.   (Classical) function, which is a well-defined (inner-defined) function for all elements in its domain of definition, or (T, I, F) = (1, 0, 0).

    ii.   Neutrofunction (or neutrosophic function), is a function that is partially well defined (degree of truth T), partially indeterminate (degree of indeterminacy I), and partially externally defined (degree of falsehood F) in its domain of definition, where (T, I, F)∈{(1,0,0), (0,0,1)}.

    Definition 1[16]: let U be a universe of situations, H is a non-empty subset of U, with $P(H)$ the power set of H, and an attribute, with its set of attribute values, is denoted by A. Then the pair (F, H), where f $F: A \rightarrow P(H)$, is called classic soft set on H.

Definition 2 [16]: If the function $F: A \rightarrow P(H)$, where for each $x \in A, f(x) \in P(H)$ and $f(x)$ is true and unique, it is called a determinate (classical) function.

2.4 Model based on Neutrosophic Soft Sets

    Starting from a group of statements or sentences that will be denoted by $A = \{a_1, a_2, \cdots, a_k\}$, which must be classified or evaluated by the specialists that belong to the group of experts chosen for the study $E = \{e_1, e, \cdots, e_l\}$. The set of parameters to be measured is given by C={Yes, No}, where "yes" means that for the expert, the statement is positive, while "no" means the opposite.
The algorithm to follow is:

1.   A group of statements is compiled whose veracity and relevance in the legal context are to be determined. These will be denoted by $A = \{a_1, a_2, \cdots, a_k\}$.

A group of experts or specialists are convened to issue a criterion regarding the veracity or relevance of the statements described. This is understood as a set $E = \{e_1, e, \cdots, e_l\}$.

2.   The expert (e_j) is asked to give his opinion on the statement a_i about truthfulness and relevance Expert (e_j) is asked to rate the truth of the statement and its relevance on a scale of 0 to 100. This value is called α_{ij}.

    2.2. Expert (e_j) is asked to give an evaluation of the falsehood and irrelevance of the statement on a scale of 0 to 100. This value is called γ_{ij}

    2.3. Expert (e_j) is asked to assess the uncertainty and relevance of the situation on a scale of 0 to 100. This value is called β_{ij}

As a result, the following triad is obtained:

$$R\_ij = \langle \alpha\_ij/100, \beta\_ij/100, \gamma\_ij/100 \rangle \tag{2}$$

This is the triad of truth values between 0 and 1, to evaluate the degrees of truth, indeterminacy, and falsehood, respectively, of the relevance of the i-th test according to the j-th expert.

3. The Soft Set is formed by $F: A \rightarrow P(H)$, where $A = \{si, no\}$, being as follows:

$$F(yes) = \{(a_i, e_j, R_{ij}), where\ R_{ij} \neq \langle 0, \tau, 1 \rangle, \tau \geq 0\}, \tag{3}$$

while:

$$F(no) = \{(a_i, e_j, R_{ij}), where\ R_{ij} \neq \langle 1,0,0 \rangle\} \tag{4}$$

4. The results for tests or evidence are obtained from:

$$G(yes) = \{(a_i, \wedge_j R_{ij}): j \in \{1,2,\cdots,l\}\ such\ that\ (a_i, e_j, R_{ij}) \in F(si)\} \tag{5}$$

Where, (6) $[\![\wedge\_j R]\!]\_ij = \langle min\_j\{\alpha\_ij/100\}, max\_j\{\beta\_ij/100\}, max\_j\{\gamma\_ij/100\} \rangle$

$$G(no) = \{(a_i, \wedge_j NOT(R_{ij})): j \in \{1,2,\cdots,l\}\ such\ that\ (a_i, e_j, R_{ij}) \in F(no)\}\,(7)$$

Where, $[\![NOT(R]\!]\_ij) = \langle \gamma\_ij/100, \beta\_ij/100, \alpha\_ij/100 \rangle$

5. For each proof or evidence s_i, select between $G(yes)$ y $G(no)$ the triad that meets the following requirements.

    5.1 If a_i is in $G(yes)$ and is not in $G(no)$, then this statement is determined to be true or relevant, with a truth value determined by $\bar{R}_i = \wedge_j R_{ij}$.

    5.2 If a_i is in $G(no)$ and is not in $G(yes)$, then this statement is determined to be true or relevant, with a truth value determined by $\tilde{R}_i = \wedge_j NOT(R_{ij})$.

    5.3 If a_i is in both sets, the following criteria are followed:

A single value $V\_i = (2 + R\_i1 - R\_i2 - R\_i3)/3$ is calculated, where $\bar{R}_i = \langle \bar{R}_{i1}, \bar{R}_{i2}, \bar{R}_{i3} \rangle$, while $F\_i = (2 + R\_i1 - R\_i2 - R\_i3)/3$, where $\tilde{R}_i = \langle \tilde{R}_{i1}, \tilde{R}_{i2}, \tilde{R}_{i3} \rangle$.

    5.3.1   If $\bar{V}_i > \bar{F}_i$ then the i-th statement is relevant with a truth value of $\bar{R}_i$.

    5.3.2   If $\bar{V}_i < \bar{F}_i$ then the ith test is not relevant with a value of truth $\tilde{R}_i$.

    5.3.4   If $\bar{V}_i = \bar{F}_i$ then it is determined that the ith test is not relevant enough with a truth value of $\bar{R}_i = \langle \bar{R}_{i1}, \bar{R}_{i2}, \bar{R}_{i3} \rangle$.

6. The statements that were classified as relevant are issued, sorted from highest to lowest, where $e_m \succ e_n$ if and only if $\bar{V}_m > \bar{V}_n$.

3 Application

3.1 Application of the General Problems Solving Method (GPSM)

Stage 1: Identification of problems
In order to identify the difficulties associated with judging contraventions committed in indigenous justice, a survey of a universe of 153 law students from the Universidad Autónoma de Los Andes is proposed.
Calculation of the sample that constitutes a significant part of the universe, was carried out using formula 1

Where
N = population universe (153)
E: 5% = 0.05 Z: 1.96 (value that corresponds to a coefficient of 95%).
P: 50% = 0.50 (since the value is not known, maximum variability is assumed)

Q: 1 -P = 0.50
n= 110

Survey applied:

The purpose of this instrument is to collect information on knowledge about the judgment of contraventions committed in indigenous justice, this survey is completely anonymous, and the data obtained from it will be processed for investigative purposes. We appreciate your contribution to the development of this study.

1- Have you heard how indigenous justice is applied?
2- Do you know what is understood in legal terms as indigenous justice?
3- Do you consider that the information on indigenous justice issues is well organized?
4- Do you observe contradictions or limitations associated with the application of indigenous justice? Mention them.

Source: own elaboration.

The resulting responses were processed and tabulated, as shown in Table 1:

Question	Yes	No	Partially
1- Have you heard how indigenous justice is applied?	65%	28%	7%
2- Do you know what is understood in legal terms as indigenous justice?	82%	3%	15%
3- Do you consider that the information on indigenous justice issues is well organized?	53%	29%	18%
4- Do you observe contradictions or limitations associated with the application of indigenous justice? Mention them.	67%	33%	0%

Table 1. Survey questionnaire. Source: own elaboration

Once the information was processed, the following limitations or difficulties were identified:

1- Lack of effective communication actions that make known the essence and form of application of indigenous justice.
2- Ambiguity and lack of clarity in relation to the modes of action of indigenous justice to guarantee compliance with human and constitutional rights without limiting their application.
3- Inexistence of an adequate legal framework that allows the organic application of ordinary and indigenous justice without duplication of sanctions.

To carry out the neutrosophic analysis of the difficulties encountered, 4 law professors were chosen, those who had a greater command of the subject and at least 5 years of experience teaching it. The 4 professors consulted (p_1, p_2, p_3, p_4) issue their criteria regarding the difficulties identified (d_1, d_2, d_3), in triads of values from 0 to 100, in order to standardize truthfulness, negative and indeterminate answers, where the first score represents the certainty or relevance of the assertion raised, the second value indicates doubt or indeterminacy regarding the assertion described and the third value indicates the falsehood of that assertion.

2.2.1. Stage 2. Analysis of the causes. Application of the Neutrosophic Model.

Professor/Difficulty	d_1	d_2	d_3
p_1	⟨62,15,20⟩	⟨79,14,8⟩	⟨89,6,14⟩
p_2	⟨69,12,17⟩	⟨86,10,6⟩	⟨83,0,9⟩
p_3	⟨78,8,12⟩	⟨73,18,13⟩	⟨92,9,13⟩
p_4	⟨82,11,8⟩	⟨76,16,7⟩	⟨81,10,21⟩

Table 2: Result of the evaluation of the difficulties according to the teachers.

The above results are divided by 100 to bring them to a [0, 1] scale which is more common in neutrosophic theories.

Professor/Difficulty	d_1	d_2	d_3
p_1	⟨0.62,0.15,0.20⟩	⟨0.79,0.14,0.8⟩	⟨0.89,0.6,0.14⟩
p_2	⟨0.69,0.12,0.17⟩	⟨0.86,0.10,0.6⟩	⟨0.83,0,0.9⟩
p_3	⟨0.78,0.8,0.12⟩	⟨0.73,0.18,0.13⟩	⟨0.92,0.9,0.13⟩
p_4	⟨0.82,0.11,0.8⟩	⟨0.76,0.16,0.7⟩	⟨0.81,0.10,0.21⟩

Table 2: Result of the evaluation of the difficulties according to the teachers, expressed in the form of neutrosophic numbers.

Soft sets are defined as:

$$F(yes) = \begin{Bmatrix} (p_1, d_1, \langle 0.62, 0.15, 0.20 \rangle), (p_1, d_2, \langle 0.79, 0.14, 0.8 \rangle), (p_1, d_3, \langle 0.89, 0.6, 0.14 \rangle), \\ (p_2, d_1, \langle 0.69, 0.12, 0.17 \rangle), (p_2, d_2, \langle 0.86, 0.10, 0.6 \rangle),, \\ (p_2, d_3, \langle 0.83, 0, 0.9 \rangle), (p_3, d_1, \langle 0.78, 0.8, 0.12 \rangle), (p_3, d_2, \langle 0.73, 0.18, 0.13 \rangle), \\ (p_3, d_3, \langle 0.92, 0.9, 0.13 \rangle), (p_4, d_1, \langle 0.82, 0.11, 0.8 \rangle), \\ (p_4, d_2, \langle 0.76, 0.16, 0.7 \rangle), (p_4, d_3, \langle 0.81, 0.10, 0.21 \rangle) \end{Bmatrix}$$

$$F(no) = \begin{Bmatrix} (p_1, d_1, \langle 0.62, 0.15, 0.20 \rangle), (p_1, d_2, \langle 0.79, 0.14, 0.8 \rangle), (p_1, d_3, \langle 0.89, 0.6, 0.14 \rangle), \\ (p_2, d_1, \langle 0.69, 0.12, 0.17 \rangle), (p_2, d_2, \langle 0.86, 0.10, 0.6 \rangle),, \\ (p_2, d_3, \langle 0.83, 0, 0.9 \rangle), (p_3, d_1, \langle 0.78, 0.8, 0.12 \rangle), (p_3, d_2, \langle 0.73, 0.18, 0.13 \rangle), \\ (p_3, d_3, \langle 0.92, 0.9, 0.13 \rangle), (p_4, d_1, \langle 0.82, 0.11, 0.8 \rangle), \\ (p_4, d_2, \langle 0.76, 0.16, 0.7 \rangle), (p_4, d_3, \langle 0.81, 0.10, 0.21 \rangle) \end{Bmatrix}$$

$G(yes) = \{(d_1, \langle 0.62, 0.15, 0.20 \rangle), (d_2, \langle 0.73, 0.18, 0.13 \rangle), (d_3, \langle 0.81, 0.10, 0.21 \rangle)\}$

$G(no) = \{(d_1, \langle 0.20, 0.15, 0.62 \rangle), (d_2, \langle 0.13, 0.18, 0.73 \rangle), (d_3, \langle 0.21, 0.10, 0.81 \rangle)\}$

From $G(yes)$ and $G(no)$ it is concluded that is relevant with a truth value of $\langle 0.62, 0.15, 0.20 \rangle$, d_2 is relevant with a truth value of $\langle 0.73, 0.18, 0.13 \rangle$, and finally, d_3 is also relevant with a truth value of $\langle 0.81, 0.10, 0.21 \rangle$.

This decision is made since, $\bar{V}_1 = 0.80 > \bar{F}_1 = 0.45$; $\bar{V}_2 = 0.9 > \bar{F}_2 = 0.37$; $\bar{V}_3 = 0.91 > \bar{F}_3 = 0.42$.

The difficulties identified are ranked as follows: $d_3 \succ d_2 \succ d_1$, where all are relevant or important according to the results obtained.

Finally, the order of relevance of the identified difficulties is as follows:

1- d_3: Inexistence of an adequate legal framework that allows the organic application of ordinary and indigenous justice without duplication of sanctions.
2- d_2: Ambiguity and lack of clarity in relation to the modes of action of indigenous justice that guarantee compliance with human and constitutional rights without limiting their application.
3- d_1: Lack of effective communication actions that make known the essence and form of application of indigenous justice.

Conclusions

The application of indigenous justice is a right for the peoples of this origin, but it also represents a challenge for the state and legal sciences. In order to identify the difficulties associated with judging contraventions committed in indigenous justice, a survey was applied to 110 law students from the Universidad Autónoma de Los Andes. The analysis of these difficulties must be from a multidisciplinary and open perspective, considering the uncertainty in the information. This possibility is opened with the application of neutrosophy and the chosen soft set model also allowed the hierarchization of the difficulties encountered. The level of relevance according to the method applied is: the most relevant is the lack of an adequate legal framework that allows the organic application of ordinary and indigenous justice without duplication of sanctions. Followed by the ambiguity and lack of clarity in relation to the modes of action of indigenous justice to guarantee compliance with human and constitutional rights without limiting their application. Finally, the lack of effective communication actions that make known the essence and form of application of indigenous justice.

References

[1]   U. D. Berg and L. P. Martínez, "The Legality of (Im) mobility: Migration, Coyoterismo, and Indigenous Justice in Southern Ecuador," in *Migration in South America*: Springer, Cham, 2022, pp. 145-166.
[2]   L. Viaene and G. Fernández-Maldonado, "Legislating coordination and cooperation mechanisms between indigenous and ordinary jurisdictions: reflections on progress and setbacks in Ecuador," in *Critical Indigenous Rights Studies*: Routledge, 2018, pp. 201-226.
[3]   V. Santafe-Troncoso and P. A. Loring, "Indigenous food sovereignty and tourism: The Chakra Route in the Amazon region of Ecuador," *Journal of Sustainable Tourism,* vol. 29, no. 2-3, pp. 392-411, 2021.
[4]   J. J. Guzmán, "Decolonizing Law and expanding human rights: Indigenous conceptions and the rights of nature in Ecuador," *Journal of Human Rights,* no. 4, pp. 59-86, 2019.
[5]   H. E. Laguna Delgado, C. M. Méndez Cabrita, J. M. Puetate Paucar, and M. E. Álvarez Tapia, "Origen y evolución del pluralismo jurídico en América Latina, como una visión crítica desde la perspectiva del derecho comparado," *Revista Universidad y Sociedad,* vol. 12, no. 5, pp. 381-388, 2020.

[6]   C. A. Hand, J. Hankes, and T. House, "Restorative justice: The indigenous justice system," *Contemporary Justice Review,* vol. 15, no. 4, pp. 449-467, 2012.

[7]   P. Lupien, "The incorporation of indigenous concepts of plurinationality into the new constitutions of Ecuador and Bolivia," *Democratization,* vol. 18, no. 3, pp. 774-796, 2011.

[8]   M. Khan, L. H. Son, M. Ali, H. T. M. Chau, N. T. N. Na, and F. Smarandache, "Systematic review of decision making algorithms in extended neutrosophic sets," *Symmetry,* vol. 10, no. 8, p. 314, 2018.

[9]   N. El-Hefenawy, M. A. Metwally, Z. M. Ahmed, and I. M. El-Henawy, "A review on the applications of neutrosophic sets," *Journal of Computational and Theoretical Nanoscience,* vol. 13, no. 1, pp. 936-944, 2016.

[10]   D. Molodtsov, "Soft set theory—first results," *Computers & mathematics with applications,* vol. 37, no. 4-5, pp. 19-31, 1999.

[11]   M. L. Vázquez, J. Estupiñan, and F. Smarandache, "Neutrosofía en Latinoamérica, avances y perspectivas," *Revista Asociación Latinoamericana de Ciencias Neutrosóficas. ISSN 2574-1101,* vol. 14, pp. 01-08, 2020.

[12]   I. Deli, "Interval-valued neutrosophic soft sets and its decision making," *International Journal of Machine Learning and Cybernetics,* vol. 8, no. 2, pp. 665-676, 2017.

[13]   M. Abu Qamar and N. Hassan, "An approach toward a Q-neutrosophic soft set and its application in decision making," *Symmetry,* vol. 11, no. 2, p. 139, 2019.

[14]   M. I. Ali, F. Feng, X. Liu, W. K. Min, and M. Shabir, "On some new operations in soft set theory," *Computers & Mathematics with Applications,* vol. 57, no. 9, pp. 1547-1553, 2009.

[15]   J. I. Pozo, M. d. Pérez, J. Domínguez, M. Gómez, and Y. Postigo, "La solución de problemas," *Madrid: Santillana,* 1994.

[16]   F. Smarandache, "Introduction to the IndetermSoft Set and IndetermHyperSoft Set," *Neutrosophic Sets and Systems,* vol. 50, no. 1, p. 38, 2022.

[17]   M. E Gaspar Santos, M. A. Zambrano Olvera & K. C. Triviño Vera. "Obligaciones contractuales de los empleadores para regular relaciones laborales con sus trabajadores en empresas privadas". Universidad y Sociedad, vol. 14 no. S2, pp 55-64, 2022.

[18]   J. C. D. J. Arrias Añez, I. J. Diaz Basurto & C. E. Paucar Paucar. "Análisis socio-jurídico sobre la figura de la suspensión condicional del proceso en materia penal". Universidad y Sociedad, vol. 14 no. S2, pp 17-22, 2022.

[19]   Romero Fernández, A. J., Álvarez Gómez, G. A., & Estupiñán Ricardo, J. "La investigación científica en la educación superior como contribución al modelo educativo". Universidad Y Sociedad, vol. 13 no. S3, pp 408-415, 2021.

[20]   Álvarez Gómez, S. D., Romero Fernández, A. J., Estupiñán Ricardo, J., & Ponce Ruiz, D. V. "Selección del docente tutor basado en la calidad de la docencia en metodología de la investigación". Conrado, vol. 17 no. 80, pp 88-94, 2021.

[21]   Vera, D. C., Suntaxi, A. V. T., Alcívar, G. C. I., Ricardo, J. E., & Rodríguez, M. D. O. "Políticas de inclusión social y el sistema de ingreso a las instituciones de educación superior del Ecuador". Dilemas Contemporáneos: Educación, Política y Valores. Vol. 1 no. 19, pp 1-18, 2018.

[22]   Leyva Vázquez, M. Y., Estupiñán Ricardo, J., Coles Gaglay, W. S., & Bajaña Bustamante, L. J. "Investigación científica. Pertinencia en la educación superior del siglo XXI". Conrado, vol. 17 no. 82, 2021.

[23]   Ricardo, J. E. (2018). "Estrategia de Gestión en la Educación Superior; pertinencia e impacto en la interrelación de los procesos académicos, de investigación científica y de vinculación con la sociedad en el periodo enero 2016-mayo 2018 en la Facultad de Ciencias Jurídicas, Sociales y de la Educación de la Universidad Técnica de Babahoyo en Ecuador". Infinite Study, 2018.

[24]   Estupiñán Ricardo, J., Martínez Vásquez, Á. B., Acosta Herrera, R. A., Villacrés Álvarez, A. E., Escobar Jara, J. I., & Batista Hernández, N. "Sistema de Gestión de la Educación Superior en Ecuador. Impacto en el Proceso de Aprendizaje". Dilemas Contemporáneos: Educación, Política y Valores, 2018.

[25]   Von Feigenblatt, O. F. "Honor, Loyalty, and Merit: The Cultura Contemporary of the Spanish Nobility". Ediciones Octaedro, 2022.

[26]   A. L. Santillán Molina, M. F. Medina Lascano, E. J. Escobar Gonzales & D. F. Coka Flores. "Análisis crítico–jurídico sobre las nuevas normas de comportamiento ético gubernamental en Ecuador". Universidad y Sociedad, vol. 14 no. S4, pp 398-414, 2022.

[27]   H. E. Lozano Rojas, M. C. Moran Giler & M. R. Dávila Castillo. "Causal relations in the deficiencies of the administrative and judicial process of national adoption in Ecuador". Universidad y Sociedad, vol. 14 no. S4, pp 415-424, 2022.

[28]   J. D, Bósquez Remache, J. P Zambrano Zambrano, G. C. Robles Santana & R. A. Falconi Herrera. "El principio de presunción de inocencia como condición para la suspensión condicional de la pena en Ecuador". Universidad y Sociedad, vol. 14 no. S4, pp 387-397, 2022.