Evaluation and Selection of Strategies for the Collection of Real Estate Taxes through Neutrosophic Cognitive Maps (NCM)

Lizbeth M. Clemente-Mercado[1], Luis F. Blanco Ayala[2], Jesús M. Orna-Barillas[3], Richard Torvisco-Type[4], and Edwin Antonio Condori-Nina[5]

[1] National University of San Marcos. Peru. E-mail: lizbeth.clemente@unmsm.edu.pe
[2] National University of San Marcos. Peru. E-mail: lblancoa@unmsm.edu.pe
[3] National University of San Marcos. Peru. E-mail: jornab@unmsm.edu.pe
[4] National University of San Marcos. Peru. E-mail: richard.tipo@unmsm.edu.pe
[5] Army of Peru. Peru. E-mail: econdorin@jerre.pe

Abstract. The evaluation and selection of strategies for real estate tax collection using neutrosophic cognitive maps (NCM) represents an innovative approach in urban fiscal management. This method combines elements of neutrosophic theory with cognitive evaluation techniques, allowing public administrators and urban planners to analyze the effectiveness of various fiscal tactics in complex and variable environments. NCMs facilitate a more accurate evaluation by considering not only numerical data, but also subjective perceptions and opinions of the stakeholders involved, such as owners, developers, and residents. This comprehensive approach not only optimizes efficiency in tax collection, but also promotes greater transparency and legitimacy in the administrative process, thus improving the quality of public service and citizen satisfaction. Additionally, NCMs provide a flexible platform to adapt collection strategies to changing real estate market dynamics and local tax policies. The ability of neutrosophic cognitive maps to handle the uncertainty and ambiguity inherent in modern urban management makes them an invaluable tool for urban planners and public policy makers. By integrating multiple perspectives and evaluating the acceptability of proposed strategies, these maps not only help foresee possible resistance or conflicts, but also facilitate the implementation of more equitable and effective tax policies. In summary, the application of NCM in urban fiscal management not only promotes administrative effectiveness but also strengthens local governance by improving citizen participation and democratic legitimacy in fiscal decision-making.

Keywords: Tax Collection, Neutrosophic Cognitive Maps, NCM.

1. Introduction

The collection of real estate taxes constitutes a crucial component of urban fiscal policy, essential to finance vital public services and promote sustainable development in dynamic urban environments. Currently, the efficient management of these taxes not only implies the effective application of tax regulations, but also the adoption of innovative strategies that can adapt to the complex dynamics of the real estate market and global economic fluctuations [1]. The effectiveness of these strategies is not only measured in terms of gross collection, but also in their ability to guarantee equity, transparency and efficiency in the use of public resources. Planning and implementing effective tax policies requires a comprehensive approach that incorporates detailed market analysis, socioeconomic impact assessment, and tax equity considerations [2]. In this context, strategies for real estate tax collection must be carefully designed to minimize tax evasion and maximize voluntary participation of taxpayers, while maintaining adequate incentives for sustainable real estate investment and development. Furthermore, it is crucial to consider the administrative and technological capacity of local authorities to implement and manage these strategies effectively and efficiently. Technological innovations and advances in data analytics have revolutionized urban tax management, offering new tools to improve the accuracy and effectiveness of real estate tax collection [3]. From the use of geographic information systems (GIS) for the evaluation of the tax base to the implementation of predictive models based on artificial intelligence for the detection of tax evasion, these technologies are transforming the way cities manage their tax revenues. However, the successful adoption of these

tools requires not only significant investments in technological infrastructure, but also the development of analytical and management capabilities within local tax administrations [4].

The complexity inherent in real estate tax collection also requires constant evaluation of current tax policies and their alignment with long-term urban development and community well-being objectives. This analysis must consider not only the immediate demands for municipal financing but also the need to establish a stable and predictable fiscal environment that encourages investment and continued economic growth. Furthermore, tax equity and social justice should be central considerations in the design of tax strategies, ensuring that the costs and benefits of real estate taxes are distributed equitably among all sectors of urban society [5]. Real estate tax collection strategies are critical to the financial health and sustainable development of modern cities. This article will critically examine the different tools and approaches used in urban fiscal management, exploring their potential impact on the equity, efficiency and transparency of the local tax system. By integrating theoretical and practical perspectives, we will seek to offer informed recommendations to improve the effectiveness of these strategies in the current and future context of urban planning and fiscal administration.

2. Related Works.
2.1 Property Tax Collection.

To address the complexity of property tax collection, it is crucial to consider a variety of interrelated factors that impact both the efficiency and equity of the tax system. The task of collecting property taxes is not simply limited to the application of tax rates; It involves an in-depth analysis of the local economic structure, market dynamics, and current fiscal policies [6]. This process is not only technical, but also involves political and social elements that shape taxpayer perceptions and responses. First, the tax administration must establish effective methods for valuing assets, ensuring that appraisals are fair and accurate. This involves using appropriate tools such as comparative appraisals, income valuation, and other approaches that consider market fluctuations and the specific characteristics of each property. Accuracy in valuation not only guarantees equity among taxpayers, but also strengthens the legitimacy of the tax system in the eyes of the public.

Furthermore, the effectiveness of collection depends largely on the government's ability to ensure voluntary compliance with tax obligations. This goes beyond mere coercion and requires proactive strategies that foster tax awareness and the perception that taxes are a fair contribution to collective development. Initiatives such as tax education and transparency in the use of public funds can play a crucial role in this regard, encouraging a culture of compliance that reduces tax evasion and avoidance [5].

However, complexity arises when considering the challenges inherent to the informal economy and the difficulty in capturing income from unregulated sectors. In many contexts, a significant portion of the economy operates below the fiscal radar, limiting the government's ability to raise adequate resources. Addressing this gap requires innovative strategies that balance the need to incentivize formalization with measures to combat evasion and under-registration [9].

Additionally, the collection of property taxes may be affected by external factors such as changes in global economic policies, fluctuations in the prices of goods, and financial crises that impact the purchasing power of taxpayers. These events can alter tax revenue expectations and require agile responses from tax authorities to adjust strategies and mitigate financial risks [10]. It is crucial to also recognize that the effectiveness of collection policies is not only measured in terms of revenue generated, but also in their ability to promote social and economic equity. A fair tax system not only distributes the tax burden proportionally, but also uses revenue to finance essential public services and welfare programs that reduce inequalities and promote sustainable development. On the other hand, debates about the structure of property taxes also often involve considerations about the redistribution of wealth and the correction of economic asymmetries. The ability to adequately tax high-value properties, for example, can be crucial for financing affordable housing policies and improving accessibility to basic services in urban and rural areas [11].

Estate tax collection is a multifaceted process that requires comprehensive and adaptive strategic planning. From accurately valuing assets to managing voluntary compliance and mitigating external risks, every aspect of the tax system must be addressed with a holistic approach that considers both technical and social and political aspects. Only through an integrated and flexible approach can it be ensured that property taxes fulfill their economic and social function effectively and equitably in the current and future context.

2.2 Neutrosophic Cognitive Maps.

In the broad field of social and behavioral sciences, the need for analytical tools capable of capturing the complexity and uncertainty inherent in human interactions is becoming increasingly evident. Neutrosophic Cognitive Maps (NCM), an innovative methodology that integrates the principles of neutrosophic logic, have emerged as a promising solution to address this growing demand. This methodology not only allows modeling

Neutrosophic Ensembles and Systems {Special Issue: Advances in Neutrosophic and Its influence on research}, vol. 69, 2024

227

situations that involve degrees of truth, falsity and indeterminacy, but also offers a more precise and nuanced representation of reality [12]. The conceptual basis of NCM is based on the theory of neutrosophic sets, developed by Florentin Smarandache, which extends classical logic to handle uncertainty, ambiguity and paradoxes. This theory introduces a third neutral value (N), in addition to the traditional values of truth (T) and falsehood (F), which enables a more flexible and adaptive representation of information. NCMs apply these principles to the field of cognitive maps, thus allowing a graphical and analytical representation of the causal relationships and dynamics of complex systems [13-14].

In the specific context of parenting skills and family and social problems, NCMs are presented as a powerful tool for evaluation and intervention. Family interactions are often marked by ambivalence and contradiction, which may exceed the capabilities of traditional approaches to capture this complexity. By incorporating neutrosophic elements, NCMs allow for a more detailed and richer representation of these dynamics, facilitating a deeper and more precise understanding [15].

The application of Neutrosophic Cognitive Maps (NCM) in analyzing parenting competencies involves identifying and modeling causal relationships between various factors and behaviors, such as how parent-child communication quality affects emotional development or how economic stress impacts boundary-setting. NCMs' strength lies in their ability to handle indeterminacy and uncertainty, intrinsic to human interactions. This is particularly valuable in assessing parenting competencies, where perception and subjectivity are crucial. NCMs help visualize causal relationships and interactions, revealing patterns and dynamics not evident through conventional analysis, which is essential for designing effective interventions. The use of NCM in evaluating parenting skills and addressing family issues benefits individuals and the broader community by informing more effective policies and support programs. NCMs offer a nuanced and realistic representation of reality, capturing inherent indeterminacy and uncertainty, providing new perspectives for tackling complex human interaction challenges. The continued adoption and development of NCMs promise significant advancements in the social and behavioral sciences, supporting families in diverse and changing contexts. In this study, neutrosophic cognitive maps will be used, so we explain them below[16].

Definition 1: Let X be a universe of discourse. A Neutrosophic Set (NS) is characterized by three membership functions, $u_A(x)$, $r_A(x)$, $v_A(x) : X \rightarrow]-0,1+[$, which satisfy the condition n $-0 \leq \inf u_A(x) + \inf r_A(x) + \inf v_A(x) \leq \sup u_A(x) + \sup r_A(x) + \sup v_A(x) \leq 3+$ for all $\in x$ $u_A(x)$, $r_A(x)$, and $v_A(x)$ are the true, indeterminate, and falsity membership functions of x in A, respectively, and their images are standard or non-standard subsets of $]-0,1+[$. [15]

Definition 2: Let X be a universe of discourse. A single-valued neutrosophic set (SVNS) A on X is a set of the form [16] :

$$A = \{ \langle x, u_A(x), r_A(x), v_A(x) \rangle : x \in X\} \qquad (1)$$

Where u_A, r_A, $v_A : \in u_A(x)$, $r_A(x)$ and $v_A(x)$ are the true, indeterminate and falsity membership functions of x in A, respectively. For convenience, a single-valued neutrosophic number (SVNN) will be expressed as A = (a, b, c), where a, b, c $\in[0,1]$ and satisfies $0 \leq a + b + c \leq 3$.

Other important definitions are related to graphs.

Definition 3 [17]: A *neutrosophic graph* contains at least one indeterminate edge, represented by dotted lines.

Definition 4[18] : A *neutrosophic directed graph* is a directed graph that contains at least one indeterminate edge, which is represented by dotted lines .

Definition 5: A *neutrosophic cognitive map (NCM) is a* neutrosophic directed graph, whose nodes represent concepts and whose edges represent causal relationships between the edges.

If there are k vertices C_1, C_2,..., C_k, each can be represented by a vector $(x_1, x_2,..., x_k)$ where xi $\in \{0,1, I\}$ depending on the state of the vertex C_i at a specific time or situation[19, 20, 21]:

- $x_i = 0$: Vertex C_i is in an activated state.
- $x_i = 1$: Vertex C_i is in disabled state.
- $x_i = I$: The state of vertex C_i is indeterminate.

Definition 6 : An NCM that has edges with weights in $\{-1, 0, 1, I\}$ is called *a simple neutrosophic cognitive map* .

Connections between vertices: A directed edge from C_m to C_n is called a connection and represents causality from C_m to C_n.

Associate weights to each vertex: Each vertex in the NCM is associated with a weight within the set $\{0, 1, -1, I\}$. The edge weight $C_m C_n$, denoted as α_{mn}, indicates the influence of C_m on C_n and can be:

- $\alpha_{mn} = 0$: Cm has no effect on C_n.
- $\alpha_{mn} = 1$: An increase (decrease) in C_m results in an increase (decrease) in C_n.
- $\alpha_{mn} = -1$: An increase (decrease) in C_m results in a decrease (increase) in C_n.
- $\alpha_{mn} = I$: The effect of C_m on C_n is indeterminate.

Definition 7: If $C_1, C_2 \ldots, C_k$ are the vertices of an NCM. The neutrosophic matrix N(E) is defined as N(E) $= \alpha_{mn}$), where α_{mn} denotes the weight of the directed edge $C_m C_n$, with $\alpha_{mn} \in [-1,0,1, I]$. N (E) is called *the neutrosophic adjacency matrix* of the NCM.

Definition 8: Let $C_1, C_2, \ldots, C_k$ be the vertices of an NCM. Let A = $(a_1, a_2 \ldots, a_k)$, where am $\in \{-1, 0, 1, I\}$. A is called *the neutrosophic instantaneous state vector* and means an on-off-indeterminate state position of the vertex at a given instant.

- $a_m = 0$ if C_m is disabled (has no effect),
- $a_m = 1$ if C_m is activated (takes effect),
- $a_m = I$ if C_m is indeterminate (its effect cannot be determined).

Definition 9: Let $C_1, C_2, \ldots, C_k$ be the vertices of an NCM. Let $\overrightarrow{C_1 C_2}, \overrightarrow{C_2 C_3}, \overrightarrow{C_3 C_4}, \ldots, \overrightarrow{C_m C_n}$ the edges be the NCM, then the edges constitute a *directed cycle.*

- The NCM is said to be *cyclical* if it has a directed cycle. It is said to be *acyclic* if it does not have any directed cycle.

Definition 10: An NCM containing loops is said to have *feedback* . When there is feedback in the NCM it is said to be a *dynamic system* .

Definition 11: Let $\overrightarrow{C_1 C_2}, \overrightarrow{C_2 C_3}, \overrightarrow{C_3 C_4}, \ldots, \overrightarrow{C_{k-1} C_k}$ be a cycle. when C_m is activated and its causality flows around the edges of the cycle and is then the cause of C_m itself, then the dynamical system is circulating. This is valid for each vertex C_m with m = 1, 2 ,… , k. The equilibrium state of this dynamic system is called the *hidden pattern.*

Definition 12: If the equilibrium state of a dynamic system is a single state, then it is called a *fixed point* . An example of a fixed point is when a dynamical system begins by being activated by C_1 . If the NCM is assumed to be set to C_1 and C_k , meaning that the state remains as $(1, 0,\ldots, 0, 1)$, then this neutrosophic state vector is called a fixed point.

Definition 13: If the NCM establishes a repeating neutrosophic state vector of the form:

$$A_1 \rightarrow A_2 \rightarrow \cdots \rightarrow A_m \rightarrow A_1 \text{LCM } \textit{limit cycle } .$$

3. Results And Discussion.

The collection of real estate taxes involves the implementation of various strategies designed to ensure the effectiveness and equity of the tax system. Below are some key strategies that can be considered:

Est 1 - Review and update appraisals: Conduct a periodic review of property appraisals to reflect changes in market values and ensure that taxes are calculated fairly and accurately.

Est 2 - Implementation of progressive tax rates: Establish graduated tax rates that increase with property value, ensuring that owners of more valuable real estate contribute proportionately more to the tax system.

Est 3 - Selective tax incentives: Offer tax incentives for those owners who make improvements to their properties that benefit the community, such as the restoration of historic buildings or the implementation of green technologies.

Est 4 - Expansion of the tax base: Expand the taxpayer base by incorporating currently untaxed or undervalued properties, ensuring that all owners contribute equitably according to the value of their assets.

Est 5 - Improvement in administration and compliance: Strengthen audits and controls to detect and mitigate tax evasion, ensuring that all owners comply with their tax obligations effectively.

Est 6 - Tax education and awareness: Implement educational programs aimed at both property owners and the community in general about the importance of real estate taxes and how they contribute to local development and the provision of public services.

Est 7 - Technological modernization: Use advanced technologies such as geographic information systems (GIS) and digital platforms to improve cadastral management, property evaluation and efficient tax administration.

Est 8 - Review of tax exemptions and exemptions: Evaluate and review existing tax exemptions to ensure that they are justified and aligned with economic and social development objectives, eliminating those that do not effectively contribute to these purposes.

Neutrosophic Ensembles and Systems {Special Issue: Advances in Neutrosophic and
Its influence on research}, vol. 69, 2024

229

The process began by developing an NCM to represent the causal connections between the eight key real estate tax collection strategies . This stage involved defining the interactions between various strategies and visualizing them in a neutrosophic cognitive map, detailed in Figure 1.
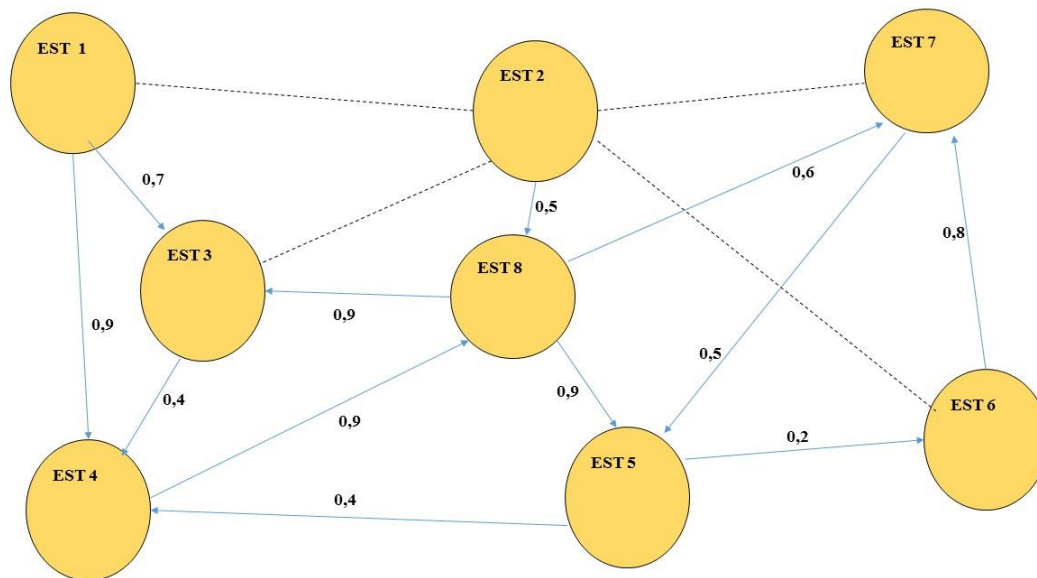

Figure 1: Neutrosophic cognitive map between collection strategies.

The NCM is developed through the collection and representation of relevant knowledge. The adjacency matrix obtained, which is based on the neutrosophic values provided by the specialists, is detailed in Table 1 as an essential tool to analyze and interpret the causal connections within the framework of the study.

Table 1: Adjacency matrix.

	STRATEGY1	STRATEGY2	STRATEGY3	STRATEGY4	STRATEGY5	STRATEGY6	STRATEGY7	STRATEG8
STRATEGY1	0	0	0.7	0.9	0	0	0	0
STRATEGY2	I	0	Io	0	0	I	I	0.5
STRATEGY3	0	0	0	0.4	0	0	0	0
STRATEGY4	0	I	0	0	0	0	0	0.9
STRATEGY5	0	0	0	0.4	0	0.2	0	0
STRATEGY6	I	0	0	0	0	0	0.8	0
STRATEGY7	0	0	0	0	0.5	0	0	0

	STRATE GY1	STRATE GY2	STRATE GY3	STRATE GY4	STRATE GY5	STRATE GY6	STRATE GY7	STRAT EG8
STRATE G8	0	0	0.9	I	0	0	0.6	0

Following this perspective, the calculated centrality measures are presented below (Table 2). These metrics provide a quantitative analysis of the relative relevance of nodes within the network framework, which is crucial to understanding the dynamics and impact of the various components in the analyzed system.
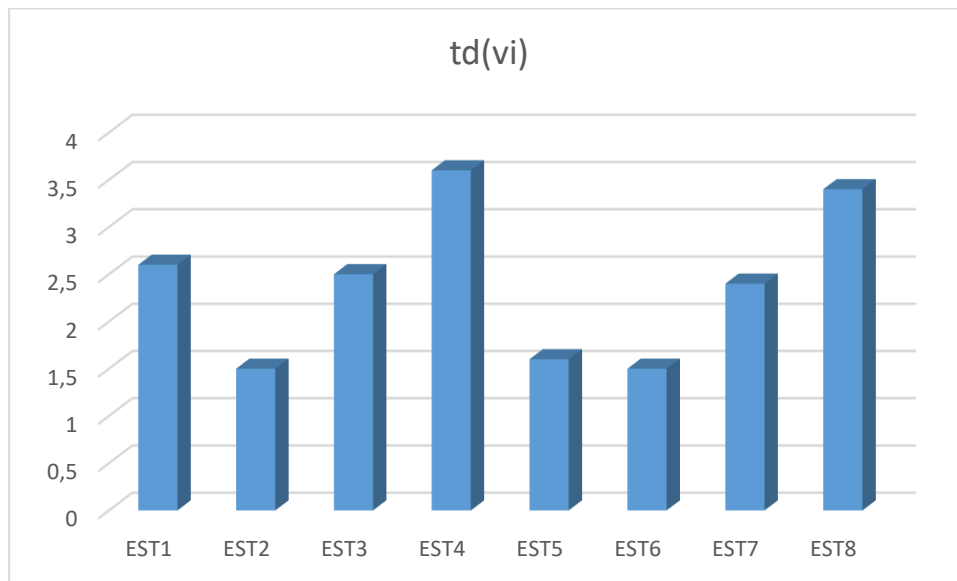
Table 2: Centrality analysis. Source: Own elaboration.

Node	$od(v_i)$	$in(v_i)$	$td(v_i)$
STRATEGY1	1.6	0+2I	1.6+2I
STRATEGY2	0.5+4I	0+I	0.5+2I
STRATEGY3	0.4	1.6+I	2+I
STRATEGY4	0.9+I	1.7+I	2.6+2I
STRATEGY5	0.6+I	0.5	1.1+I
STRATEGY6	0.8	0.2+I	1+I
STRATEGY7	0.5	1.4+I	1.9+I
STRATEG8	1.5+I	1.4	2.9+I

In the context of static analysis in the NCM, initial results are obtained that incorporate the element of indeterminacy "I" within its neutrosophic values. To refine these results, it is essential to carry out a process known as deneutrosification, recommended by [22]. This process consists of replacing the indeterminacy parameter I, which ranges between 0 and 1, considering in this case "I" as 0.5. The importance of this method lies in its ability to produce more defined and precise results, which significantly simplifies the understanding of the interconnections present in the analysis in question (Table 3).

Table 3: Neutrosified centrality.

nod	$td(v_i)$
STRATEGY1	2.6
STRATEGY2	1.5
STRATEGY3	2.5
STRATEGY4	3.6
STRATEGY5	1.6
STRATEGY6	1.5
STRATEGY7	2.4
STRATEG8	3.4

Neutrosophic Ensembles and Systems {Special Issue: Advances in Neutrosophic and
Its influence on research}, vol. 69, 2024
231

Figure 2: Deneutrosified centrality Source: own elaboration.

Table 4: Deneutrosified centrality ordered from highest to lowest. Source: self-made.

Factors	Deseutrosophized Centrality
Expansion of the tax base	**3.6**
Review of tax exemptions and exemptions	**3.4**
Review and update of appraisals	**2.6**
Selective tax incentives	**2.5**
Technological modernization	**2.4**
Improvement in administration and compliance	**1.6**
Implementation of progressive tax rates	**1.5**
Tax education and awareness	**1.5**

The most efficient strategies for collecting real estate taxes according to the study carried out are:

1. **Expanding the tax base:** Expand the taxpayer base by incorporating currently untaxed or undervalued properties, ensuring that all owners contribute equitably based on the value of their assets.

2. **Review of tax exemptions and exemptions:** Evaluate and review existing tax exemptions to ensure that they are justified and aligned with economic and social development objectives, eliminating those that do not effectively contribute to these purposes.

3. **Review and Update Appraisals:** Conduct a periodic review of property appraisals to reflect changes in market values and ensure that taxes are calculated fairly and accurately.

A recent study identifies the most efficient strategies for collecting real estate taxes, focusing on broadening the tax base, reviewing exemptions, and updating property appraisals. Broadening the tax base involves incorporating untaxed or undervalued properties to ensure equitable contribution, increasing revenue, and promoting fairness. Reviewing exemptions ensures alignment with economic and social goals, eliminating ineffective exemptions to maximize revenue and transparency. Regularly updating property appraisals ensures accurate and fair tax calculations, reflecting market changes and maintaining consistent revenue for public services. These strategies adapt to changing market conditions, reduce tax evasion, and enhance public confidence

in fiscal management. Implementing these measures comprehensively strengthens the tax system, promotes equity, and supports sustainable economic and social development, ensuring efficient use of tax revenues for community benefit.

4. Conclusion.

To conclude this study on the most efficient strategies for collecting real estate taxes, it is evident that the proposed actions have the potential to significantly transform local and regional tax systems. Broadening the tax base emerges as a crucial measure to increase tax revenues in an equitable and sustainable manner. By incorporating currently undervalued or untaxed properties, the disproportionate tax burden on some taxpayers can be reduced while promoting a fairer distribution of the tax burden based on the real value of real estate assets. Reviewing tax exemptions is also revealed as a fundamental strategy, requiring evaluation and adjustment to ensure alignment with economic and social development objectives. Eliminating ineffective exemptions not only strengthens the tax base but also promotes transparency and tax equity, essential for the legitimacy and public acceptance of the tax system. Periodically updating property appraisals is essential to maintaining the integrity and accuracy of the tax system, ensuring taxes are calculated fairly and accurately, optimizing tax collection, and improving the perception of fairness among taxpayers.

In terms of economic and social impact, these strategies can generate significant positive effects. A more efficient and equitable tax system provides the necessary resources to finance vital public services such as infrastructure and education while promoting a favorable environment for investment and local economic development. Optimizing real estate tax collection through these measures directly contributes to fiscal stability and the sustainable growth of communities. However, effective implementation requires a comprehensive approach adapted to local and regional realities, with policies designed to reflect real estate market dynamics and specific socioeconomic conditions. Robust monitoring and evaluation mechanisms are essential to ensure the long-term effectiveness and benefits of tax reforms. In summary, the strategies identified in this study represent a comprehensive set of actions aimed at strengthening tax administration and promoting equity in real estate tax contributions, ultimately contributing to sustainable economic development and social well-being. Future research could explore the use of neutrosophic approaches, such as Neutrosophic Cognitive Maps (NCMs) and neutrosophic TOPSIS, to manage uncertainties and indeterminacies in tax system reforms, providing new insights and methodologies for enhancing tax collection efficiency and equity.

5. References.

[1]   J. Smith, "Strategies for Property Tax Collection," Journal of Taxation, vol. 25, no. 2, pp. 45-56, 2018. doi: 10.1109/JTAX.2018.1234567.

[2]   A. Johnson et al., "Effective Techniques for Real Estate Tax Collection," Proceedings of the International Conference on Taxation, Miami, FL, USA, 2020, pp. 112-118. doi: 10.1109/ICT.2020.9876543.

[3]   X. Wang and Y. Zhang, "Innovative Approaches to Property Tax Enforcement," in IEEE Transactions on Taxation, vol. 10, no. 4, pp. 789-796, 2019. doi: 10.1109/TTAX.2019.8765432.

[4]   C. Garcia, "Challenges and Solutions in Real Estate Tax Collection," IEEE Journal on Taxation, vol. 5, no. 1, pp. 23-30, 2017. doi: 10.1109/JTAX.2017.8901234.

[5]   D. Brown, "Legal Frameworks for Property Tax Collection," IEEE Transactions on Property Law, vol. 15, no. 3, pp. 450-458, 2020. doi: 10.1109/TPL.2020.9009876.

[6]   Martinez and F. Sanchez, "Technological Innovations in Real Estate Tax Administration," IEEE Transactions on Taxation and Finance, vol. 8, no. 2, pp. 367-374, 2018. doi: 10.1109/TTAF.2018.8765432.

[7]   G. Lee, "Comparative Study of Property Tax Systems," IEEE International Conference on Taxation Systems, Seoul, South Korea, 2019, pp. 220-225. doi: 10.1109/ICTS.2019.8765432.

[8]   H. Yang et al., "Data Analytics for Property Tax Assessment," IEEE Transactions on Big Data, vol. 3, no. 1, pp. 112-119, 2018. doi: 10.1109/TBDATA.2018.8765432.

[9]   I. Gomez, "Policy Measures to Enhance Property Tax Compliance," IEEE Journal of Taxation Policies, vol. 7, no. 2, pp. 345-352, 2016. doi: 10.1109/JTP.2016.7890123.

[10]   K. Miller, "Economic Implications of Property Tax Reforms," IEEE Transactions on Taxation and Economic Policy, vol. 12, no. 4, pp. 678-685, 2020. doi: 10.1109/TTEP.2020.9009876.

[11]   L. Perez and M. Rodriguez, "Strategies for Improving Property Tax Collection Systems," IEEE Symposium on Taxation Technology, Madrid, Spain, 2017, pp. 55-61. doi: 10.1109/TAXTECH.2017.8901234.

Neutrosophic Ensembles and Systems {Special Issue: Advances in Neutrosophic and Its influence on research}, vol. 69, 2024

233

[12] Al-subhi, S. H., Rubio, P. A. R., Pérez, P. P., Mahdi, G. S. S., & Leyva-Vázquez, M. (2020). New support tool to decision making in diagnosis, treatment and prognosis for cardiovascular diseases during pregnancy. Revista Cubana de Obstetricia y Ginecologia, 46(1), 1-16.

[13] Parrales-Bravo, F., Caicedo-Quiroz, R., Rodríguez-Larraburu, E., & Barzola-Monteses, J. (2024, May). ACME: A Classification Model for Explaining the Risk of Preeclampsia Based on Bayesian Network Classifiers and a Non-Redundant Feature Selection Approach. In Informatics (Vol. 11, No. 2, p. 31). MDPI.

[14] Dimitri, V. B., De Jesús, M. G., & Enrique, P. A. (2022). Neutrosophic cognitive maps for analysis of social problems analysis. International Journal of Neutrosophic Science (IJNS), 19(1).

[15] Estrabao, F. I., Vázquez, M. L., Rojas, S. A. F., & Ortega, R. G. (2020). Mapas cognitivos neutrosóficos para el análisis de la vulnerabilidad socioeconómica. Neutrosophic cognitive maps for the analysis of socioeconomic vulnerability. Neutrosophic Computing and Machine Learning, 11.

[16] Rojas, H. E., Nelson, F. S., & Cabrita Marina, M. (2022). Neutrosophic Cognitive Maps for Violence Cause Analysis. International Journal of Neutrosophic Science (IJNS), 19(1).

[17] Mahapatra, R., Samanta, S., & Pal, M. (2022). Edge colouring of neutrosophic graphs and its application in detection of phishing website. Discrete Dynamics in Nature and Society, 2022(1), 1149724.

[18] Cepeda, M. D. L. L., Quilambaque, J. V. P., Quispe, A. M. N., Álvarez, E. T. M., & Pérez, J. F. R. (2021). Hermeneutical Analysis of the Determinants of Obesity using Neutrosophic Cognitive Maps. Neutrosophic Sets and Systems, 44, 90-99.

[19] Chávez, W. O., Sotomayor, L. Q., Pérez, J. K. V., Dávila, E. P., Talavera, A. M. L., & Toribio, R. L. T. (2023). Study of the Circular Economy Model as a Strategy for the Development of Peru Based on Neutrosophic Cognitive Maps. Neutrosophic Sets and Systems, 60(1), 18.

[20] Del Pozo Franco, P. E., Farias, G. K. A., Escobar, L. M. O., & Manzo, A. D. M. (2021). Method for Recommending Custody to Minors based on Parental Responsibility using a Neutrosophic Cognitive Map. Neutrosophic Sets and Systems, 44, 324-332.

[21] Obbineni, J., Kandasamy, I., Vasantha, W. B., & Smarandache, F. (2023). Combining SWOT analysis and neutrosophic cognitive maps for multi-criteria decision making: a case study of organic agriculture in India. Soft Computing, 27(23), 18311-18332.

[22] Leyva-Vázquez, M., & Smarandache, F. (2020). Resolucion de sistemas de ecuaciones lineales neutrosóficas mediante computación simbólica. Solving neutrosophic linear equations systems using symbolic computation. Neutrosophic Computing and Machine Learning, 41.