



Analyzing the impact of social factors on homelessness with neutrosophic cognitive maps

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Abstract

Homeless people are marginalized because they lack the resources necessary to participate in mainstream culture. It is not unusual to come across homeless persons in the streets of Quito, Ecuador, particularly in the downtown area. Society often refers to them as the unaccepted, the outcasts, the marginalized, and the homeless. Being a victim of aggressiveness is not an inevitable part of life on the streets. Still, unfortunately, we are seeing more and more instances of it being shown nearly every day. Many groups work to alleviate this problem by providing aid or enhancing the quality of life for these individuals. The goal of this study is to aid in strengthening the work of such institutions by providing a rationale for why so many crimes are decided to commit even against the homeless and how these institutions can better equip themselves to deal with the issue, as well as by providing tasks to assist direct the Homeless toward the Good Having to live Plan. A cognitive map of neutrosophic causes and effects was constructed.

Keywords: Neutrosophic cognitive maps; homeless, crime; Measure of Centrality;

1. Introduction

Poverty, an inadequate supply of affordable housing, poor physical and mental health, addictions, and the dissolution of communities and families are only some of the economic and social reasons that contribute to homelessness. Mixtures of these characteristics affect how long someone is homeless, how often, and what kind of homelessness they experience[1]–[3]. Complete homelessness is defined as being without any permanent housing. However, many people suffer other degrees of housing insecurity, such as staying in shelters that are unreliable, unsafe, or unfit for human habitation. Since there is no universally accepted definition of homelessness, policymakers have difficulty devising strategies that they believe will help alleviate the issue[4]–[7].

According to 1995 research conducted in Bangladesh, the homeless are those who "sleep rough," or in other words, in unprotected public places such as streets, railroad stations and stations, public transportation, parks, green spaces, religious centers, building sites, and surrounding graveyards[8]–[10].

This study's primary goal is to comprehend the interaction of numerous social forces better.

Dhaka has researched the issue of homelessness. Ahmed addressed People's Lives and Ways of Making a Living in Dhaka's Urban Environment. Sustainable Sources of livelihood: Initial Experience and Lessons, DFID, London, was discussed by Ashley and Carney. The Nature, Extent, and Elimination of Unemployment in India is the topic of writing by Bannerjee and Das. Night shelters programs for the homeless: A case study of Delhi is a project that Garg has worked on. Unfortunately, no previous research has used mathematical techniques to study the homeless situation in Bangladesh. Therefore, FCM and a metric of importance will be used to investigate the causes of homelessness.

It is generally agreed that the following categories capture the most important reasons for people becoming homeless: To what extent do substances, Emotional (they classify factors connected to isolation and the disintegration of social networks), Individual, and Official/Affiliated

The current condition presents a dire outlook. Many more individuals are now homeless than before the COVID-19 health crisis started. More individuals are living on Quito's streets now than before the outbreak. Overnight, they find safe havens from the storm. There is no complex data, but the Head of the Ecuadorian Red Cross reveals that 150 food packages had been distributed in the last few weeks, with 75% going to 'new' residents. It has been raised by 30 per day, he says.

It's not good news that homelessness is on the rise. In theory, they should cause a decline in the economy since they provide no benefit to society. Since they do not have a secure income, a safe place to live, or access to necessities like food, healthcare, clean water, and sanitation, it is agreed that they do not qualify as citizens, so this policy should be supported. That's right: they don't owe any money to the government, therefore, they don't have to pay taxes or get a pension or state pensions to check every month. As far as the ruling class is concerned, they do not make any monetary contributions to the progress of a nation.

The tourism industry and the public's mental image of the area are also likely to feel the effects (Quito). Since the primary campaigns of the cities, made by their mayors or municipalities, present a "clean Quito" or a "21st Century Guayaquil," a picture regarding the homeless as a present that disrupts and offends these ideals.

Tourists often refer to vagrants with disdain because they see them as a burden on the community or an intruder to their destination.

Since preconceptions transform citizens into criminals regularly, this pessimistic perspective complicates the situation again for the supervision of these individuals. Given in large part to the fact that bigotry drives many crimes committed against the emotional and physical well-being of the homeless. Currently, agoraphobia, or hostility against the poor and helpless, is classified as a hate crime in Ecuador. Hate crimes are committed not only to send a message of prejudice to the individual victimized but also to the larger community to which that victim belongs[11], [11]–[14].

Being a victim of aggressiveness is not an inevitable part of life on the streets, but unfortunately, we are seeing more and more instances of it being shown every day. Sadly, many victims do not disclose their abuse for a variety of reasons, including the belief that it would not help, fear of potential reprisals, and the dread of being ejected from the country in the case of immigrants in an irregular or unlawful position Globally, young individuals are more likely to commit such acts of violence, and the evidence reviewed indicates that this is particularly true when it comes to perpetrating such actions against males older than 45 and young women who are homeless.

2. Methodology

With these foundational pieces in place, this work proposes using Neutrosophic Cognitive Maps (NCMs) because of the benefits they provide over other smooth methods in terms of understandability, scalability, expertise agglomeration, fluidity, and the capability to represent

comments and fuzzification connections. First used NCMs in 2003. The Fuzzy Cognitive Maps (FCMs), first proposed by Kosko in 1986, and the Neutrosophic Sets (NSs) presented by Smarandache in 1995, come together in NCMs. When using this method, indeterminacy may be represented in FCMs for the first time[15]–[18]. Figure 1 shows the neutrosophic cognitive map. Since indeterminacy is included, we know that apathy and unawareness qualify as uncertainty. Demonstrates that FCMs are a method that is gaining popularity owing to the options it offers for describing causality. Here is a glossary of terms you'll need while dealing with NCMs. Let us now explicitly present the first concept of neutrosophic logic.[19]–[23]

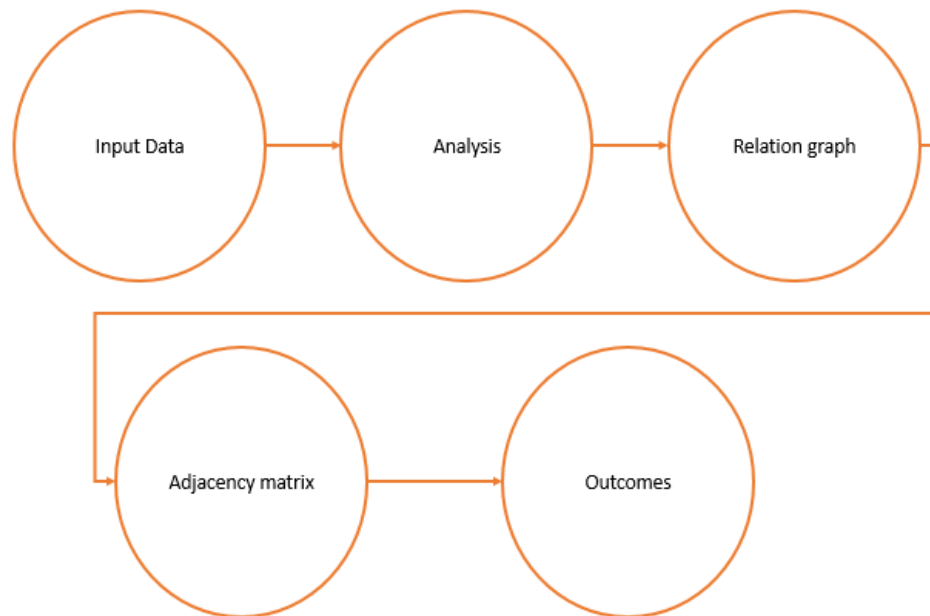


Figure 1: The neutrosophic cognitive map.

Definition 1: Let $N = \{(a, b, c) : a, b, c \in [0, 1]\}$ be a neutrosophic set of evaluation. Where a, b, and c refer to true, indeterminate, and false.

$$v(p) = (a, b, c)$$

so, neutrosophic logic is generalization of fuzzy logic

Definition 2: Imagine that the set of all real numbers is denoted by the letter K . If $K \cup I$ generates a ring such that I fulfills

$$I^2 = I, I + I = 2I,$$

and in general $I + I + \dots + I = nI$,
 and if k , then $kI = kI, 0I = 0$,
 then we call this ring a neutrosophic ring.
 $K(I)$ is the neutrosophic ring, and it is formed by KI ;
 that is, $K(I) = K \cup I$, where $K \cup I$ is the ring generated by K and I .

Definition 3: If each $a_{ij} \in K(I)$, where $K(I)$ is a neutrosophic ring, then the matrix $A = [a_{ij}]_{ij}$ is said to be neutrosophic. Let us note that a matrix entry might have the form $a + bI$, with a and b being real integers and I being the indeterminacy factor. Normal neutrosophic matrix operations may be generalized from classical matrix operations.

$$\begin{pmatrix} 1 & 3 \\ 4 & 10 \end{pmatrix} \begin{pmatrix} 10 & 30 \\ 40 & 100 \end{pmatrix} = \begin{pmatrix} 130 & 330 \\ 440 & 120 + 1000 \end{pmatrix}$$

Neutrosophic graphs are those with at least one ambiguous vertex or edge. The eigenvector in traditional graph theory is refined into the neutrosophic adjacency matrix. If a_{ij} is equal to 0, nodes i and j are not linked; if it is equal to 1, then they are; and if it is similar to I , then the connection is ambiguous. They are foreign to fuzzy set theory.

However, suppose the indeterminacy is inserted in a cognitive map in the way described in. In that case, we get what is termed a neutrosophic cognitive map, which is particularly helpful in the representation of causal knowledge. Definition 4 provides a formal explanation.

Definition 4: An NCM is a neutrosophic directional network where ideas like policies and occurrences are nodes and causalities, and indeterminacies are edges. It's a metaphor for the chain of events that leads from one idea to another.

The results of the adjacency matrix are used to calculate the following metrics, which are included in the current proposal.

Neutrosophic adjacency matrices have a row sum called outdegree (v_i). It is a measure of the robustness of the variable's directional links (c_{ij}):

$$outdegree(v) = \sum_{i=1}^n c_{ij}$$

$$indegree(v) = \sum_{i=1}^n c_{ki}$$

$$totaldegree(v) = outdegree(v) + indegree(v)$$

$$\beta(|a_1, a_2|) = \frac{a_1 + a_2}{2}$$

3. Results and analysis

To investigate the social phenomena at hand, we used a four-pronged approach, each of which was informed by our prioritization of certain groups of interested parties.

Poor individuals who are homeless are mentioned in the legend HP.

Brigades: street-based aid groups that provide services to the homeless

In this case, a very simplistic model illustrates the dynamic system underlying the social forces contributing to homelessness. We first selected sixteen completely random characteristics: (P, U, E, I, A, SI, FB, MI, NGO, Pop, GA, CH, RS, C, H). It's not a steadfast principle that we must focus just on these 16 characteristics. The number of characteristics may be adjusted up or down as needed. The following characteristics of the social aspects of homelessness are selected as the primary foci of analysis:

Involvement in the Criminal Justice System

"P" is for "Poverty"

The U Word: Joblessness

I: Earnings Based on Education

Substance Abuse

Effects of Isolation on Social Interaction

Devastating Facebook Update: Breakup in the Family

Abbreviation for "Mental Illness": "MI"

A Non-Governmental Organization

Meaning of the Word "Pop"

Financial Help From The State

RE: Housing Expenses

"Rental Subsidy" or "RS" for short.

A: Accumulated Harm B: Unsheltered

The numerical results are given in the following tables. Table 1. shows the Cause-and-effect analysis of the strategic viewpoint. Figure 2 shows the summary of degrees.

Table 1: The processing of an adjacentness matrix with the phrase "government representatives

	Suffering	Urgent	Drugs	financial support	Uneducated	experienced	Migration	in	out	total	Rank
Suffering	0	1	1	1	0	0	1	0.667	0.667	1.334	2
Urgent	1	0	1	1	1	0	0	1	0.667	1.667	1
Drugs	0	1	0	0	0	1	1	0.8333	0.5	1.33	3
financial support	0	1	0	0	1	1	0	0.667	0.5	1.167	5
Uneducated	1	1	1	0	0	0	1	0.5	0.667	1.167	6
experienced	1	1	1	1	1	0	0	0.5	0.667	1.167	7
Migration	1	1	1	1	0	1	0	0.5	0.833	1.33	4

Table 2: The processing of an adjacentness matrix with the phrase "bridge representatives."

	Suffering	Urgent	Drugs	financial support	Uneducated	experienced	Migration	in	out	total	Rank
Suffering	0	0	1	1	1	1	1	1	0.833	1.83	1
Urgent	1	0	1	1	1	1	1	0.833	1	1.83	2
Drugs	1	1	0	0	0	1	1	0.833	0.667	1.49	6
financial support	1	1	0	0	1	1	0	0.667	0.667	1.33	7
Uneducated	1	1	1	0	0	0	1	0.667	0.667	1.49	4
experienced	1	1	1	1	1	0	1	0.667	1	1.67	3
Migration	1	1	1	1	0	0	0	0.667	0.83	1.49	5

Table 3: The processing of an adjacentness matrix with the phrase "shelter representatives."

	Suffering	Urgent	Drugs	financial support	Uneducated	experienced	Migration	in	Out	total	Rank
Suffering	0	1	1	1	1	0	1	1	0.83	1.83	2
Urgent	1	0	1	1	1	0	1	1	0.83	1.83	1
Drugs	1	1	0	1	0	1	1	0.83	0.83	1.66	3
financial support	1	1	0	0	1	1	0	0.83	0.667	1.49	6
Uneducated	1	1	1	0	1	0	1	0.83	0.83	1.66	4
experienced	1	1	1	1	1	0	1	0.5	1	1.5	5
Migration	1	1	1	1	0	0	0	0.667	0.667	1.33	7

Table 4: The processing of an adjacentness matrix with the phrase "HP sheltered representatives."

	Suffering	Urgent	Drugs	financial support	Uneducated	experienced	Migration	in	Out	total	Rank
Suffering	0	0	1	0	1	1	0	0.83	0.5	1.33	4
Urgent	0	0	0	1	0	0	1	0.83	0.3	1.13	7
Drugs	1	1	1	1	0	0	1	0.83	0.83	1.49	2
financial support	1	1	0	0	1	1	0	0.667	0.667	1.33	5

Uneducated	1	1	1	0	0	0	1	0.5	0.667	1.167	6
experienced	1	1	1	1	1	0	1	0.5	1	1.5	1
Migration	1	1	1	1	0	1	0	0.667	0.83	1.49	3

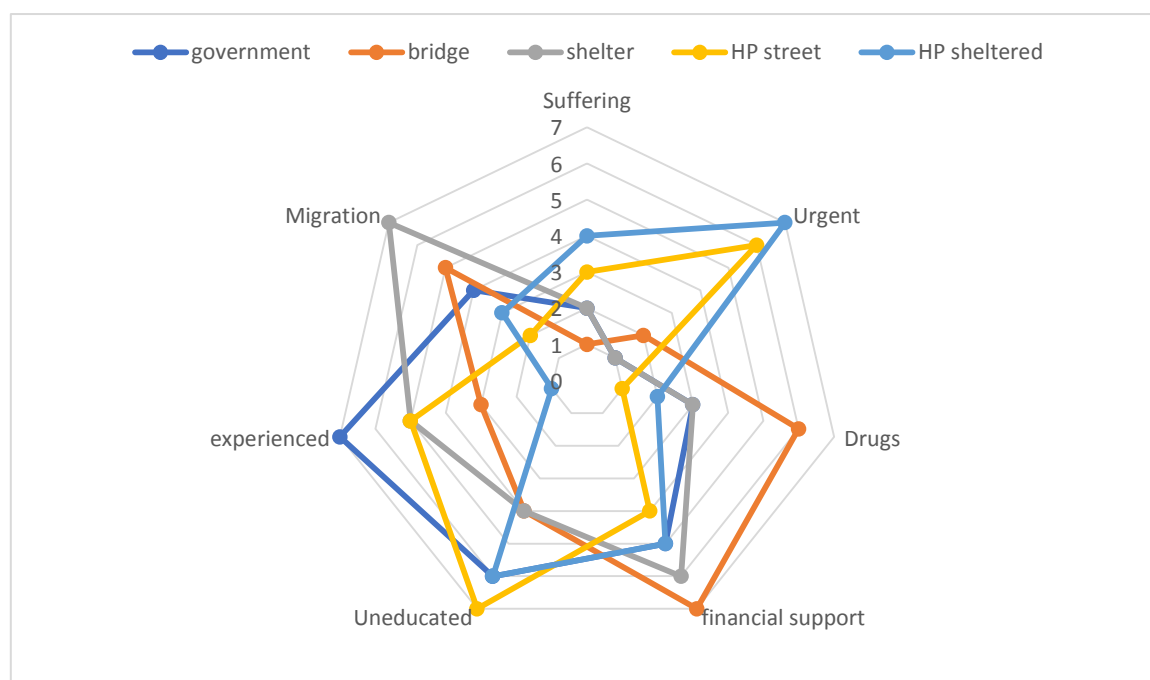


Figure 2: The summary of degrees.

4. Conclusion

While homeless people are a component of a city's public spaces, they are often the target of abuse from others who utilize them. The results show that all the homeless persons questioned had experienced harassment, humiliation, and intimidation at the hands of strangers who are intolerably prejudiced and intolerant of their acute social marginalization. When individuals are forced to sleep and live on the streets, they are exposed to both institutional and direct forms of violence, which only exacerbate the situation. The adverse effects of the financial downturn brought on by COVID-19 were shown to be exacerbated by our bibliographic research, suggesting that this is a global issue. The homeless are more vulnerable to acts of violence and social exclusion. Most of the suppression comes from the younger generation.

Moreover, it was shown that women are mainly subjected to human trafficking and sexual assault. Although it is already a crime under the Penal Code, most victims are overlooked owing to their "impoverished" status, and hence no complaints are filed. Although poverty and drug misuse are significant contributors to homelessness, it has been shown that marital violence and the end of a connection with an older person also play essential roles in causing this condition. It was also found that the small firms hit hard by the economic crisis had to relocate since their owners were low-income immigrants from Venezuela. After being turned down for help due to financial difficulties, they lived on the streets. The city government, which makes up the strategic level, views the phenomenon significantly differently from the other levels. Maybe this is what leads to the development of useless plans. It's advised that these people be a part of the aid effort so that they have access to accurate information. It's thought that initiatives should be put in place to alleviate these issues, both strategically and operationally, with the involvement of buying centers to help the homeless and education. Everything is done with the dual goals of preventing the issue before it

starts and fixing it quickly. Assistance from non-governmental and government organizations (NGOs) is essential, as is the participation of all segments of society.

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