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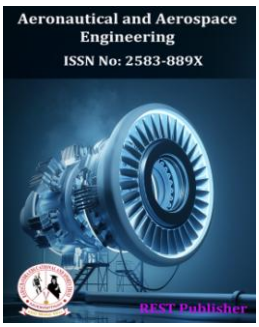


Assessment of Drinking Water Quality in Salem District Using Decision Making Test and Evaluation Laboratory Method

*** Sathiyaraj Chinnasamy, M. Ramachandran, Chinnasami Sivaji, Chandrasekar Raja**

REST Labs, Kaveripattinam, Krishnagiri, Tamil Nādu, India.

Corresponding Author Email: sathiyaraj@restlabs.in

Abstract. *Access to safe drinking water is one of the basic human rights and is essential for a healthy life. The present study, in drinking water in Salem district analyzed the concentration and health risks of various pollutants. From bore Wells, tube wells and Water samples were collected by hand pumps. Improper disposal of sewage and solid waste, excessive use of agrochemicals and poor condition of pipe network and transport Drinking water is a major source of pollution. Contamination of water with coli form bacteria can cause gastroenteritis, diarrhoea, dysentery and viral hepatitis They said that it is a major source of water-borne diseases. To reduce health risks, using drinking water from contaminated sources immediate cessation is necessary. Agricultural chemicals that cause water pollution Avoid overuse. The present study examines factors influencing the selection of SCM suppliers Aims to analyze and decide. For decision-making and evaluation system using the Neutrosophic Model (DEMATEL). To improve DEMATEL performance and to achieve competitive advantage considered a proactive approach. This study uses neutrosophic set theory, Mark each value using a new scale. A case study implementing the proposed method is presented. Interviewing experts in Neutrosophic Demodel data collection study this research is designed for management, procurement and production. In terms of drinking water quality, R+C Omalur ranked first and Sankari ranked lowest. Ri-C Sankari ranked first and Omalur ranked lowest in terms of drinking water quality.*

Keywords: *water Quality, water TDS, MCDM.*

1. INTRODUCTION

It US utilities are also concerned about drinking water quality Congress required them to begin sending annual reports to their clients by October 1999. Against the absence of such violations and reports with the minimum necessary information to include the data and reading aids the reader wants. Research on public perception of drinking water quality integrated management of water resources in general, improving water quality and Monitoring of drinking water quality is conducted in the following sectors. Because the public is clean and is the primary beneficiary of a safe water supply People are the first to experience the consequences of deteriorating water quality (WHO, 2011). Public perceptions of hazards to drinking water Governments, between water service providers and community leaders convey a conversation. These ideas are the public's thought processes and Exemplify responses to perceived risks of drinking water. International Water Association, in its 2004 "Pan Charter on Safe Drinking Water," specifically emphasized greater efforts to provide drinking water that consumers can trust. Enhanced DEMATEL, ISM and based on approximate set theory an integrated method, among the barriers to adoption of sustainable online consumption in identifying and visualizing ambiguous relationships. The proposed method is for investigating cause-effect relationships the improved DEMATEL combines the strengths of the approach. Ambiguity and subjectivity without any corroborative information or prior assumption.

2. DRINKING WATER QUALITY

In communities in Western Newfoundland Quality of tap water for households (collected from the tap, such as filtering or boiling Before any domestic change), the health risks of drinking tap water and Questions were asked about water filter applications. The input parameters at least seven input parameters at sampling stations are characterized by DWQI at least four times a year. A Quality Index (AQI) describes the aesthetic aspect (taste, smell and appearance) of drinking water. The level of contamination in drinking water Depends on the type of water sources. contaminants and there is drinking water Concerns about adverse effects To assess the level and characterization methods of various contaminants

This has prompted a great deal of research Since these are not essential for human nutrition, Expression of these elements It seriously affects your health. Essential trace nutrients in drinking water and essential to human health. Low-income and Minority communities are often sources of pollution and face a disproportionate burden of environmental pollution, even after accounting for differences in income Associations with race and ethnicity persist. Some studies between drinking water and environmental justice indicators although looking for a connection, current studies also for poor drinking water quality between these indicators a connection has been found. With a lower average income Community Water Systems (CWSs) serving communities, Nitrate and arsenic levels. In Quebec In small rural water systems, in areas of high volume scarcity Servants (Based on Income, Education and Employment) have Chances of having an improved health status and more and fewer opportunities for improved water treatment. Health-Based Violations of the SDWA A higher proportion of Hispanic or African-American residents is more common in poor communities; in more affluent society's race and the effects of race are less pronounced. Environmental justice links to drinking water continue to be overlooked and depend on the spatial scope and the individual contaminants being studied. In the Corey and Rahman water systems in Arizona Environmental Justice Disparities in Arsenic Exposures They concluded that there was limited evidence. An environment with the location of hazardous waste facilities The ability of studies to identify justice associations Studies with larger scopes are more Water quality, and reliability and can cause imbalances in infrastructure and sustainable natural, Structural and sociopolitical factors are wide-ranging. Small water supplies, especially low-income and serving minority communities, may have poor source water quality due to their proximity to sources of pollution. In addition, such facilities need the technical, Management and Finance (TMF) capacity may be reduced, Therefore comply with the testing requirements for these systems Necessary resources may not be available. A country-wide analysis indicated that smaller CWSs are more likely to have management-related SDWA violations. As problems are identified, with limited TMF Smaller organizations may struggle to address these issues by establishing new treatment methods or developing better-conserved resources [1]. These are internal factors (reduced ability to raise rates for customers) and External factors (ability to apply for loans) can be related to both. These factors are particularly prevalent in unconnected areas visible, they have no tax base and are supervised by district or state agencies are outside the municipal boundaries

3. MATERIALS AND METHODS

The gas release process is incorporated to assess critical risks. They derive the model based on the linguistic Parameter with triangular fuzzy numbers. In an ambiguous environment for organizations that face problems that require group decision-making Fuzzy DEMATEL method can be used. It shows the bias and opinions of conflicting criteria. The model proposed by Hung (2011), Accurate costing in DSC forecasting, Management controls While designing competitive advantage analysis and risk management and supply chain of multi-objective production planning Key factors can be effectively combined. Fan et al. (2012) using the extended DEMATEL method Identified the risk factors of IT outsourcing using interdependent information. Fan et al. (2012) rank the risk of failure, then fix them to avoid the risks that are fuzzy sorted Averaging (OWA) and Results Testing and Evaluation Laboratory (DEMATEL) were used. In other research to improve emergency systems the expert system is also examined. For navigation, emergency management and identification of fuzzy numbers Extended to the fuzzy DEMATEL method IFNs are not directly converted to sensitivity values but are instead converted to BPAs. By doing so, the estimation uncertainty remains. Later, the Dempster-Shafer theory was adopted, across multiple disciplines. DEMATEL method of interdependent factors is commonly used to obtain a cause-effect diagram. This method is superior to conventional techniques, because of the ability to express relationships between criteria, sorting criteria according to the type of relationships and expressing the severity of their effects on each criterion. Because once is not enough, to solve the problem considered there is a need to use an integrated approach. Therefore, to represent flexible information Fuzzy Linguistic Modeling is used to handle this accordingly, the DEMATEL method expresses the effect, is also used to establish criteria, and is also used to increase model applicability. DEMATEL provides perspective to the assessment and analyzing the magnitude or strength of influence of the relationship

4. RESULTS AND DISCUSSION

TABLE 1. Drinking Water Quality in Salem

	PH	TDS	TH	Calcium	Magnesium	Chloride	Sulphate	Sum
Salem West	6.80	1350.00	543.00	324.00	423.00	489.00	574.00	3709.80
Salem South	7.90	1400.00	573.00	529.00	432.00	539.00	583.00	4063.90
Yercaud	7.80	1278.00	577.00	364.00	462.00	573.00	482.00	3743.80
Sankari	8.30	1398.00	589.00	298.00	482.00	480.00	593.00	3848.30
Edapadi	7.10	1595.00	689.00	308.00	462.00	593.00	402.00	4056.10
Mettur	6.90	1537.00	535.00	375.00	498.00	567.00	643.00	4161.90
Omalur	7.70	1378.00	683.00	398.00	472.00	527.00	530.00	3995.70

Table 1 shows the DEMATEL Decision making trial and evaluation laboratory in Drinking water quality in Graphs with respect to Salem West, Salem Youth, Yercaud, Sankari, Edappadi, Mettur and Omalur.

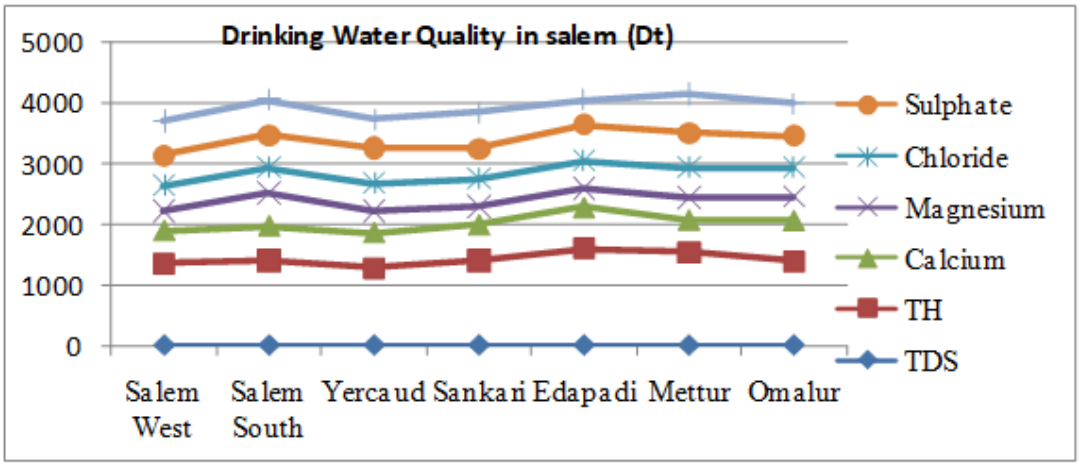


FIGURE 1. Drinking water quality in Salem

Figure 1 shows the DEMATEL Decision making trial and evaluation laboratory in Drinking water quality in Graphs of Salem West, Salem Youth, Yercaud, Sankari, Edappadi, Mettur and Omalur. It is the Drinking water quality in Graphs and the comparison of PH Value is the sum of the image.

TABLE 2. Normalizing of direct relation matrix

	PH	TDS	TH	Calcium	Magnesium	Chloride	Sulphate
Salem West	1.133333	225	90.5	54	70.5	81.5	95.66666667
Salem South	1.316667	233.3333	95.5	88.16667	72	89.83333	97.16666667
Yercaud	1.3	213	96.16667	60.66667	77	95.5	80.33333333
Sankari	1.383333	233	98.16667	49.66667	80.33333	80	98.83333333
Edapadi	1.183333	265.8333	114.8333	51.33333	77	98.83333	67
Mettur	1.15	256.1667	89.16667	62.5	83	94.5	107.1666667
Omalur	1.283333	229.6667	113.8333	66.33333	78.66667	87.83333	88.33333333

Table 2 shows the Normalising of the direct relation matrix in Salem West, Salem Youth, Yercaud, Sankari, Edappadi, Mettur and Omalur with respect to.

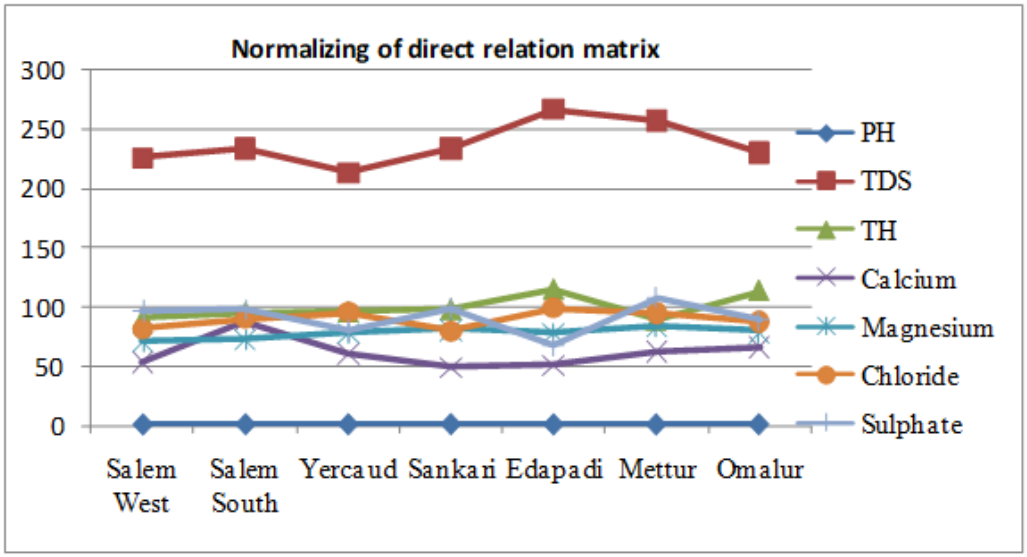


FIGURE 2. Normalizing of direct relation matrix

Figure 2 Shows that chart for Normalizing of direct relation matrix Salem West, Salem Youth, Yercaud, Sankari, Edappadi, Mettur and Omalur has Different value.

TABLE 3. Calculate the total relation matrix

	PH	TDS	TH	Calcium	Magnesium	Chloride	Sulphate
Salem West	1.1333333	225	90.5	54	70.5	81.5	95.6666667
Salem South	1.3166667	233.333333	95.5	88.166667	72	89.833333	97.1666667
Yercaud	1.3	213	96.166667	60.666667	77	95.5	80.3333333
Sankari	1.3833333	233	98.166667	49.666667	80.333333	80	98.8333333
Edapadi	1.18333333	265.833333	114.83333	51.333333	77	98.833333	67
Mettur	1.15	256.166667	89.1666667	62.5	83	94.5	107.166667
Omalur	1.2833333	229.666667	113.83333	66.333333	78.6666667	87.833333	88.3333333

Table 3 Shows the Calculate the total relation matrix in Accurate Domination in Graphs. Salem West, Salem Youth, Yercaud, Sankari, Edappadi, Mettur and Omalur.

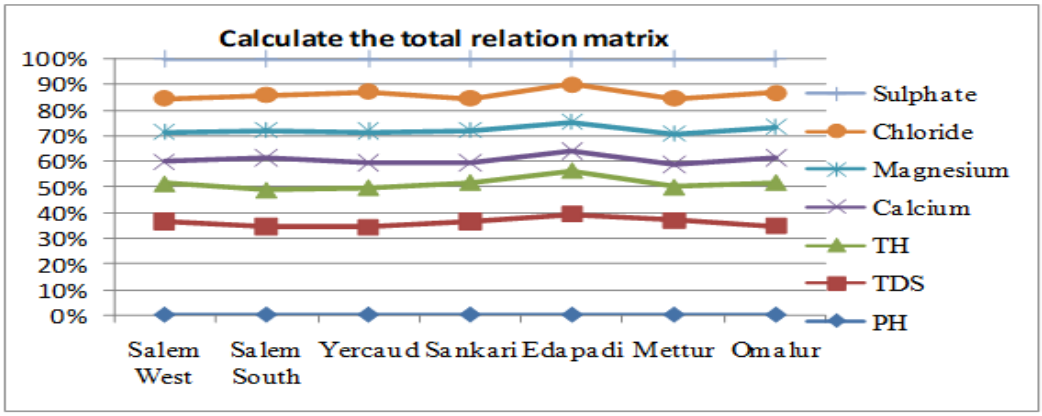


FIGURE 3. Calculate the total relation matrix

Figure 3 shows the Calculate the Total Relation Matrix in drinking water quality in Graphs Salem West, Salem Youth, Yercaud, Sankari, Edappadi, Mettur and Omalur is Calculate the Value.

TABLE 4. I- Identity matrix

	PH	TDS	TH	Calcium	Magnesium	Chloride	Sulphate
Salem West	1	0	0	0	0	0	0
Salem South	0	1	0	0	0	0	0
Yercaud	0	0	1	0	0	0	0
Sankari	0	0	0	1	0	0	1
Edapadi	0	0	0	0	1	0	0
Mettur	0	0	0	0	0	1	0
Omalur	0	0	0	0	0	0	1

Table 4 Shows the I= Identity matrix in drinking water quality in Graphs. Salem West, Salem South, Yercaud, Sankari, Edapadi, Mettur and Omalur are the common Value.

TABLE 5. Y

	PH	TDS	TH	Calcium	Magnesium	Chloride	Sulphate
Salem West	1.133333	225	90.5	54	70.5	81.5	95.66667
Salem South	1.316667	233.3333	95.5	88.16667	72	89.83333	97.16667
Yercaud	1.3	213	96.16667	60.66667	77	95.5	80.33333
Sankari	1.383333	233	98.16667	49.66667	80.33333	80	98.83333
Edapadi	1.183333	265.8333	114.8333	51.33333	77	98.83333	67
Mettur	1.15	256.1667	89.16667	62.5	83	94.5	107.1667
Omalur	1.283333	229.6667	113.8333	66.33333	78.66667	87.83333	88.33333

Table 5 shows the Y Value in Drinking water quality in Graphs Salem West, Salem South, Yercaud, Sankari, Edapadi, Mettur and Omalur Calculate the total relation matrix Value and the Y Value is the same value.

TABLE 6. I-Y

	PH	TDS	TH	Calcium	Magnesium	Chloride	Sulphate
Salem West	-0.13333	-225	-90.5	-54	-70.5	-81.5	-95.6667
Salem South	-1.31667	-232.333	-95.5	-88.1667	-72	-89.8333	-97.1667
Yercaud	-1.3	-213	-95.1667	-60.6667	-77	-95.5	-80.3333
Sankari	-1.38333	-233	-98.1667	-48.6667	-80.3333	-80	-97.8333
Edapadi	-1.18333	-265.833	-114.833	-51.3333	-76	-98.8333	-67
Mettur	-1.15	-256.167	-89.1667	-62.5	-83	-93.5	-107.167
Omalur	-1.28333	-229.667	-113.833	-66.3333	-78.6667	-87.8333	-87.3333

Table 6 Shows the I-Y Value Drinking water quality in Graphs Salem West, Salem South, Yercaud, Sankari, Edapadi, Mettur and Omalur.

TABLE 7. (I-Y)-1

	PH	TDS	TH	Calcium	Magnesium	Chloride	Sulphate
Salem West	0.132524735	-1.43694	-0.87001	-2.54966	-0.36388	2.244018	2.635571
Salem South	0.012406007	0.007839	0.031266	0.023065	-0.01081	-0.03842	-0.02147
Yercaud	-0.038843144	-0.04565	-0.02991	-0.09012	-0.01102	0.126248	0.075346
Sankari	0.041433299	0.041975	0.055385	0.124972	0.01979	-0.12623	-0.14332
Edapadi	0.131473652	0.241164	0.134358	0.356487	0.071957	-0.43104	-0.46155
Mettur	-0.068232735	-0.09393	-0.1251	-0.14995	-0.02514	0.20118	0.234727
Omalur	-0.065216443	-0.09464	-0.06773	-0.17094	-0.00643	0.185316	0.196613

Table 7 Shows the (I-Y)-1 Value Drinking Water quality in Salem West, Salem South, Yercaud, Sankari, Edapadi, Mettur and Omalur Table 6 shown the Minverse Value.

TABLE 8. Total Relation matrix (T)

	PH	TDS	TH	Calcium	Magnesium	Chloride	Sulphate
Salem West	-0.867475265	-1.43694	-0.87001	-2.54966	-0.36388	2.244018	2.635571
Salem South	0.012406007	-0.99216	0.031266	0.023065	-0.01081	-0.03842	-0.02147
Yercaud	-0.038843144	-0.04565	-1.02991	-0.09012	-0.01102	0.126248	0.075346
Sankari	-0.023783144	-0.05267	-0.01235	-1.04596	0.01336	0.059087	0.053296
Edapadi	0.131473652	0.241164	0.134358	0.356487	-0.92804	-0.43104	-0.46155
Mettur	-0.068232735	-0.09393	-0.1251	-0.14995	-0.02514	-0.79882	0.234727
Omalur	-0.065216443	-0.09464	-0.06773	-0.17094	-0.00643	0.185316	-0.80339

Table 8 shows that in The Total Relation Matrix and T matrix is same Value the direct relation matrix is multiplied with the inverse of the value that the direct relation matrix is subtracted from the identity matrix. Calculate the matrix and their threshold values (alpha) Alpha 1.346391 T thicken if the matrix value is greater than the threshold value.

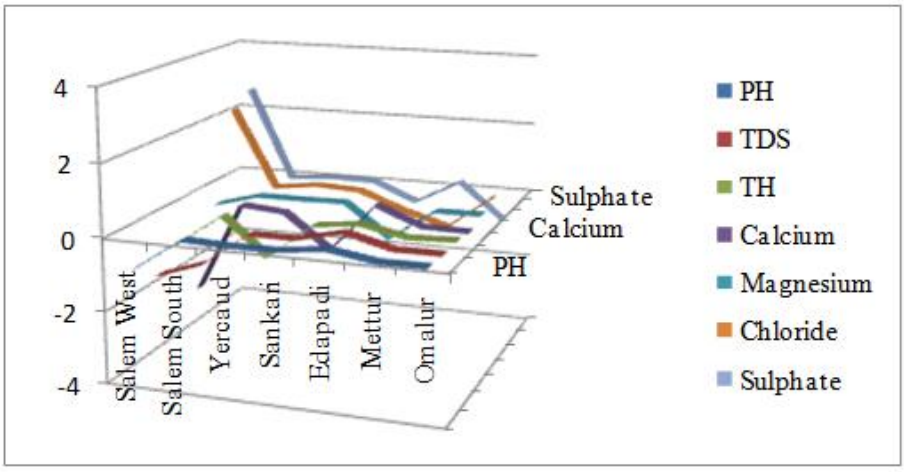


FIGURE 4. Total Relation matrix (T)

Figure 4 shows The Total Relation Matrix the direct relation matrix is multiplied with the inverse of the value that the direct relation matrix is subtracted from the identity matrix.

TABLE 9. Ri, Ci, Ri+Ci and Ri-Ci

	Ri	Ci	Ri+Ci	Ri-Ci	Identity
Salem West	-0.11234	-0.91967	-1.03201	0.807336	effect
Salem South	-1.01249	-2.47484	-3.48733	1.462343	effect
Yercaud	-1.94342	-1.93947	-3.88289	-0.00394	cause
Sankari	-1.94159	-3.62709	-5.56868	1.685494	effect
Edapadi	-2.28694	-1.33196	-3.61889	-0.95498	cause
Mettur	-1.89074	1.346391	-0.54434	-3.23713	cause
Omalur	-1.8862	1.712528	-0.17367	-3.59873	cause

Table 9 shows the Calculation of Ri, Ci, Ri+Ci and Ri-Ci to Get the Cause and Effect. Salem West, Salem South, Yercaud, Sankari, Edapadi, Mettur and Omalur there are alternative parameters.

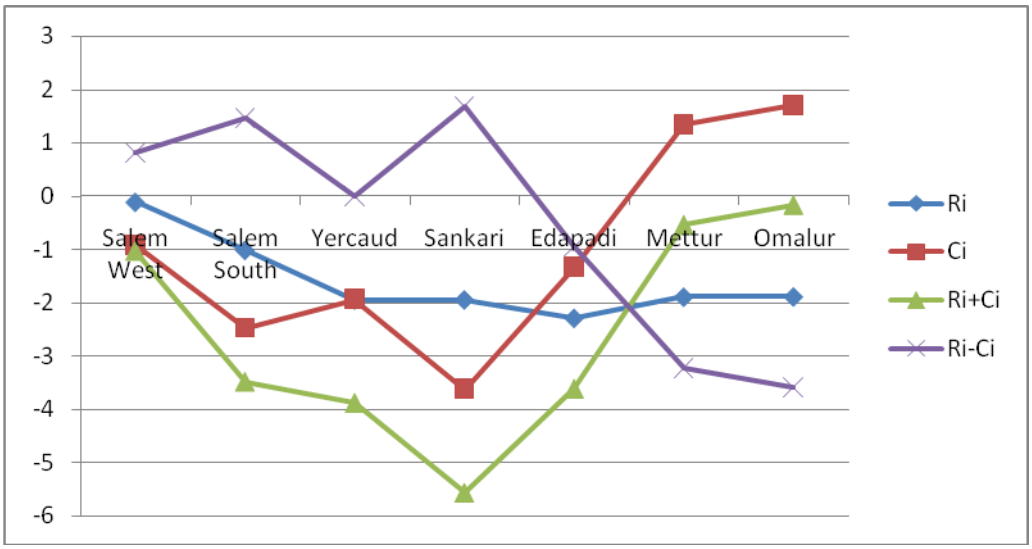


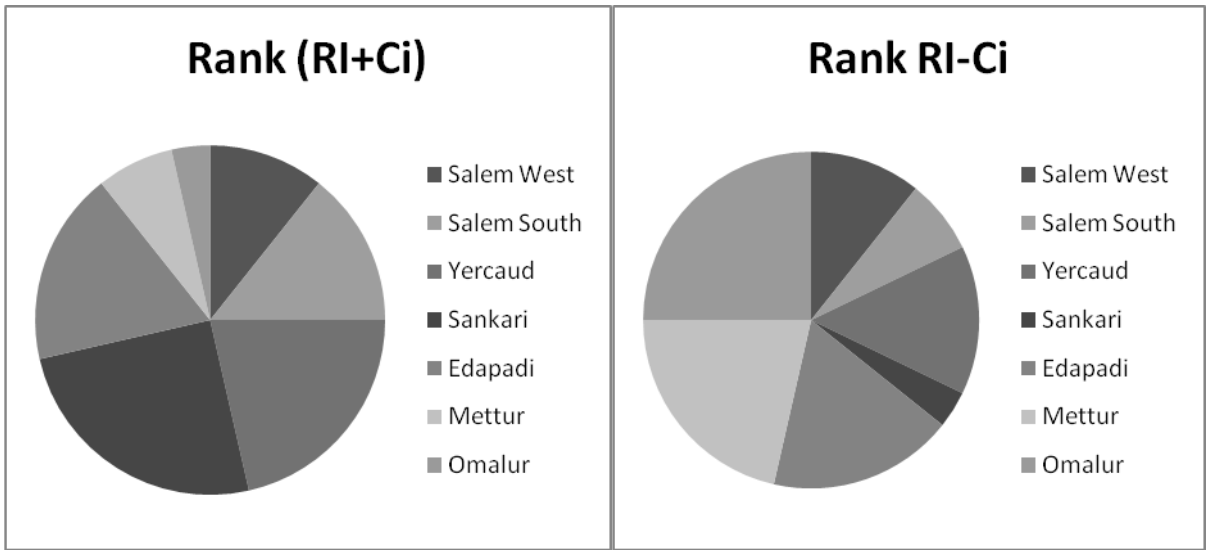
FIGURE 5. Ri, Ci, Ri+Ci and Ri-Ci

Figure 5 shows the Total Relation Matrix (T) Ri, Ci, Ri+Ci and Ri-Ci Value Drinking water quality in Graphs of Salem West, Salem South, Yercaud, Sankari, Edapadi, Mettur and Omalur.

TABLE 10. Rank

	Rank RI+Ci	**Rank RI-Ci**
Salem West	3	3
Salem South	4	2
Yercaud	6	4
Sankari	7	1
Edapadi	5	5
Mettur	2	6
Omalur	1	7

Shows table 10 that drinking water quality is Ri+Ci and Ri-Ci Rank using the DEMATEL for Accurate Domination in Graphs. Drinking water quality Ri+Ci The Omalur got the first rank whereas the Sankari is having the lowest rank. Drinking water quality Ri-Ci the Sankari got the first rank whereas the Omalur is having the lowest rank.



(A) (B)

FIGURE 6. Rank (Ri+Ci) and (Ri-Ci)

Shows the figure 6 in ranking of drinking water quality (Ri+Ci) and (Ri-Ci). Drinking water quality Ri+Ci The Omalur got the first rank whereas the Sankari is having the lowest rank. Drinking water quality Ri-Ci the Sankari got the first rank whereas the Omalur is having the lowest rank.

5. CONCLUSION

Drinking water quality of the study areas All Physico-chemical parameters it was decided to comply and WHO Standards for Drinking Water Quality at all college drinking water sampling sites. Water samples in concentrations of cations and anions do not show extreme variations. From college drinking water quality sources Bacteriological determination of water, it confirmed that it is safe for drinking water and other household uses. The study revealed the absence of faecal coliforms at all college water sampling sites. At three water sampling sites, Total coliforms were present. For causal factors of important occupational hazards it aims to develop a fuzzy DEMATEL approach. Therefore, to assess the natural causes of accidents in the construction industry this study presents a new occupational risk assessment approach, it is in the construction industry It helps managers to develop appropriate prevention strategies for accidents. The proposed method is superior to conventional techniques; it exposes relationships between factors and Ranks the criteria with respect to the type of relationships and the intensity of their effects on each criterion. Imprecise and inaccurate information was handled by using the fuzzy linguistic scale. Due to these advantages, on the implications of the analysis of cause and effect criteria to demonstrate excellent knowledge and DEMATEL is used to increase model applicability. Hence, the proposed method has the ability to represent the causal relationship of criteria and Favorable to handle group decision making in ambiguous environment. The current study uses the DEMATEL methodology to evaluate actors to develop a strategic plan to effectively structure e-waste, To solve this problem short-term and Target long-term flexible decision-making strategies. Ri+Ci Omalur also ranked first in drinking water quality, and Shankari is also ranked lowest. Ri-Ci Sankari ranked first in drinking water quality. Omalur is also ranked low.

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