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Dharumapuri District, Tamil Nadu, Groundwater Quality Status in relation to WASPAS System Pollution

***Chandrasekar Raja, M. Ramachandran, Kurinjimalar Ramu, Chinnasami Sivaji**

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

*Corresponding Author Email: chandrasekarrajarsri@gmail.com

Abstract: *Groundwater Quality. Tamil Nadu, Dharmapuri District, Domestic and Water quality for irrigation purposes to assess water quality survey has been carried out. PH, TDS, TH, Calcium, Magnesium, Chloride, Sulphate. This paper notes that increasing levels of water pollution, the resulting billion-dollar utility and with control schemes, it provides a way to measure and evaluate the quality of given water body Development of water quality codes is necessary. The data output of current water monitoring stations is huge and Dimensional reporting units are different and Not integrated in a straightforward algebraic way, even by scientifically trained users have few means of integrating the data to provide; water quality. That quality is locally better than hook and line to be broadly defined, Because of the importance of downstream streams less emphasized in that context. Ground water by comparing the measured concentration of ions and other parameters with the suggested limits provided by the Bureau of Indian Standards, the acceptability of the groundwater in this area as drinking water was determined lists the quantity and percentage of samples that exceeded the drinking quality criteria suggested by. The quantities of PH, TDS, TH, calcium, chloride, sulphate, and nitrate as well as total hardness were consistently within suggested levels in the 652 groundwater samples that were collected and analyzed water quality for drinking. MCDM difficulties include many incompatible and conflicting criteria, different measurement units in the criteria, and the existence of completely different alternatives. These decision problems describing multidimensional situations are solved by various MCDM methods. In the WASPAS method, a composite criterion is optimally two based on the criteria sought. The first criterion of optimality via a weighted average success criterion is the WSM method, which is based on the decision criteria used to evaluate the accepted MCDM approach alternatives, such as the popular one. Weighted Aggregate Product Assessment (WASPAS) this method is an effective MCDM tool when solving eight production decision problems, namely grinding level, material depletion. From the result it is seen that Karimangalam Taluk is showing the highest value for Pennagaram Taluk is showing the lowest value. Resulting in Karimangalam Taluk ranked first; there Pennagaram Taluk has low rank.*

Keywords: *Water quality, Groundwater, MCDM, Magnesium.*

1. INTRODUCTION

Tamil Nadu, Dharmapuri District, Domestic and Water quality for irrigation purposes to assess water quality survey has been carried out. PH, TDS, TH, Calcium, Magnesium, Chloride, Sulphate. This paper notes that increasing levels of water pollution, the resulting billion-dollar utility and with control schemes, it provides a way to measure and evaluate the quality of given water body Development of water quality codes is necessary. The data output of current water monitoring stations is huge and Dimensional reporting units are different and Not integrated in a straightforward algebraic way, even by scientifically trained users have few means of integrating the data to provide; water quality. That quality is locally better than hook and line to be broadly defined, Because of the importance of downstream streams less emphasized in that context. The stream is never fishable However, it is an integral part of the watershed; Protection is essential if downstream streams are to remain fishable and swimmable. The Clean Water biological integrity mandate without considering local streams separately, It depends on the overview of the entire hydrological system at the water table level. Agricultural waste, applied fertilizers, soil leach ate, urban waste,

Cattle excreta and sewage Sources of poor water quality. Some models have hardness and due to magnesium concentration are highly saline not suitable for irrigation purposes. In general, ground water farming activities of Dharmapuri district, anthropogenic activities, ion exchange and Contaminated by weather. The socio-economic well-being of the people of Tamil Nadu is significantly affected by groundwater, which is the third largest supply of fresh water in the world after glaciers and polar ice. Groundwater is used for domestic, horticultural, agricultural and hydroelectric purposes. It takes into account the intrinsic quality of groundwater, atmospheric inputs, weathering of soils and rocks, and human activity to determine whether it is suitable for use for various purposes. Degradation of surface and ground water is caused by public ignorance of environmental and related approaches, growing indiscriminate dumping of anthropogenic waste, improper pesticide use and inadequately treated sewage discharge. Groundwater is Valuable due to its wide occurrence, availability and consistently high quality. Once pollution penetrates the underground environment, it spreads over large areas of groundwater and goes unnoticed for long periods of time, making groundwater resources unfit for human consumption and otherwise. The source of water, how much it evaporates, the types of rocks and minerals, and how long it interacts with reactive minerals all affect hydrochemistry to determine whether water is suitable for different uses, it is important to assess its quality. Urban aquifers are the only natural source of drinking water supply and are often considered less suitable for this purpose. This has led to a crisis based on scarcity of drinking water, which is highly polluted and less transportable. Anywhere groundwater is used for irrigation and drinking water needs, understanding hydrochemistry is critical to determining water quality. Water quality assessments can provide clear information about the surface geologic environments in which water exists. Most of the water quality studies have been conducted across India by several researchers in Dharmapuri district, while groundwater chemistry has been investigated. Water is a valuable natural resource that supports all life on Earth. Water as a resource needs special attention because of its many benefits and the problems caused by its excess, scarcity and deteriorating quality. As ground water resources are frequently required, the objective of the study is to assess spatial distribution of several hydrogen chemical properties for groundwater quality and acceptability of groundwater sources in the study area. Pennagaram and Dharmapuri rivers drain the study area. At the south-west corner, where the Bombard River begins and eventually joins the Ponnayayar, these two rivers join. The topography of the area is steep and consists of massive rocks with fracture zones. A variety of litho logy is exposed in the research area, including alkali senates, ultramafic complexes and new dolerite intrusions.

2. MATERIAL AND METHODS

2.1. Ground Water: Ground water by comparing the measured concentration of ions and other parameters with the suggested limits provided by the Bureau of Indian Standards, the acceptability of the groundwater in this area as drinking water was determined lists the quantity and percentage of samples that exceeded the drinking quality criteria suggested by. The quantities of calcium, chloride, sulphate, and nitrate as well as total hardness were consistently within suggested levels in the 652 groundwater samples that were collected and analysed water quality for drinking. The restrictions are several points higher for various ions and parameters. When different criteria are applied for various applications, sodium concentration surpassed the advised limits in a maximum of 220 samples in the following sections, with regional variations. Additionally, there are other distinctions that have been made, and the classification of water quality varies depending on the parameters that make up the water. It attempts to make it easier to convey the outcomes of several indicators for an accurate assessment of the water quality in Thailand. To increase public awareness of drinking water issues, freshwater education at the school, community, and informal levels is essential. Adequate learning methodologies contribute to awareness, skill development, and improved interactions with experts, among other advantages. Because the foundation for comprehending drinking water is laid at a young age, it is crucial to begin water education in preschool. The narrow and neutral perception of organoleptics at this level often for young children and water issues can be influenced by educational initiatives. Geographically and socially specific concerns that need to be addressed should be determined with the strong input of academics and water experts. Piped water supplies, water services, and expertise that is particularly important in certain areas are a few examples of such themes. Water quality is greatly influenced by personal information, which also expresses thoughts on how to enhance it. When more variables are required in the code to solve certain water quality issues but the integration function does not permit this, rigidity problems arise. A regulatory body might already have an overall index, for instance, but decide to include one or more additional characteristics. This can happen when a location receives a good water quality code, but elements not covered by the code cause the water quality to decline. A similar regulatory authority in another area or region frequently demands a different set of characteristics related to water quality for its integrated index. Therefore, when applied to a different area or region, a water quality improvement strategy that is required for one area or region may produce unclear findings for a

different number of water quality parameters. You can include more variables. In the Dharmapuri district, the relationship between land use and water quality was investigated using Spearman's rank correlation analysis. Verifying whether there are substantial differences involves analyzing the variation of the standard values of a few chosen water quality metrics across land use categories.

2.2. PH: This study intends to assess if prolonged exposure to low or high pH has positive or negative impacts on tobacco physiology and growth. For Bacon, haematological variables, growth, plasma ions, and tissue phosphates were evaluated. The offspring of this species are growth-promoting and appropriate for aquaculture. These locations were chosen to look into how elements besides geography and climate might impact surface water PH. Before Texas Environmental Quality reported the data analysis as improper during a quality review, the commission was annulled. Over a three-year span, daily and seasonal means were calculated. Daily in-stream pH readings were used to create aggregate frequency plots, which evaluated the likelihood of finding a specific pH value at each site for both cumulative and seasonal data.

2.3. TDS: The estimation of bromide concentrations from chloride data was effective because to the discovery of a linear connection. Bromide demonstrated a somewhat improved association with TDS and made it simpler to collect TDS data. According to other published statistics, compared to the chloride and TDS amounts found in saltwater, its ratio relative to bromide content is 70%. Since various ions and titers in various tap water contribute to TDS. More focus should be placed on TDS SMCL because to the acknowledged national trend of rising TDS in raw water and ultimately tap water. There are worries that America will eventually become unfit for human consumption because it is too salty.

2.4. TH: Thyroid hormone (TH) Vertebrate development and regulatory processes depend on thyroid hormone (TH). Prior to now, the main emphasis has been on substances thought to be harmful to TH production, transport, and catabolism. The majority of efforts have concentrated especially on thyroid hormone (TH) activation by environmental contaminants and androgen and oestrogen balance. Industrial effluents, sediment extracts, water sources in eastern China, and finished drinking water in Beijing have all shown anti-thyroid hormone effects. Organ chlorine and other synthetic chemicals have an impact on TH functioning (OC). Pesticides used in agriculture and industry, like 4-aminophenol and phthalate esters 9 and 10, affect the thyroid receptor (TR) by preventing binding to its endogenous ligands or by adding more legends.

2.5. Magnesium: Magnesium-rich water should be consumed [4]. In developed nations, there is a low daily consumption of magnesium, according to a prior study [5]. Through a number of processes, magnesium shortage leads to cardiac arrhythmias [6]. Magnesium levels in the heart muscle were noticeably lower in autopsy studies of sudden CHD mortality [7]. Magnesium in drinking water has no detrimental effects on CHD [4]. There is evidence that it may have an impact on mortality, magnesium levels in drinking water, and the risk of various CHD fatalities. We looked at whether there was a connection between magnesium levels in drinking water and CHD mortality as there hasn't been a thorough meta-analysis to date to evaluate this association. The recommended dietary allowance for magnesium is not being met in the modern world. Water-borne magnesium can significantly increase daily consumption for those who are at risk of magnesium insufficiency. Additionally, food loses less magnesium when it is cooked in water that is high in magnesium. Magnesium's high bioavailability is another factor contributing to its significance in water. Magnesium in water plays a significant role in minimizing magnesium deficiencies in those who drink magnesium-rich water.

2.6. Chloride: The growth of plants requires the element chloride. Chloride is present in tobacco in significant proportions and accumulates quickly; values of 100 g Cal kg1 leaf dry matter are observed. While low concentrations of Cal sterility have a positive impact on tobacco yield and leaf market value, excessive concentrations in soil have some anomalous growth characteristics and are linked to unfavorable traits in cured leaf. The pace of burn is reduced and there are minimal negative effects when the cured leaf contains too much chloride. The scents and irregular hues of bacon leaves are unpleasant. This demonstrates that the outcomes of water leakage are consistent with public output.

2.7. Sulfate*:* All industrial processes fundamentally require sulphate removal technology. It could be necessary to remove sulphate in order to reuse water in mining operations. The most suitable choice for a certain mining operation will depend on site-specific factors; therefore appropriate water treatment technology must be assessed on a case-by-case basis. Chemical treatment, membrane filtering, ion exchange, biological sulphate removal by sulphate lime, and chemical precipitation of gypsum with lime are other treatment options for removing sulphate from mine waste. Sulfate concentrations are often decreased to 1,500–2,000 mg/L and less than 1,200 mg/L depending on ionic strength through removal from mine water and solution mixing.

WASPAS Method: Peculiarities of MCDM difficulties include many incompatible and conflicting criteria, different measurement units in the criteria, and the existence of completely different alternatives. These decision problems

describing multidimensional situations are solved by various MCDM methods. In the WASPAS method, a composite criterion is optimally two based on the criteria sought. The first criterion of optimality via a weighted average success criterion is the WSM method, which is based on the decision criteria used to evaluate the accepted MCDM approach alternatives, such as the popular one. Weighted Aggregate Product Assessment (WASPAS) This method is an effective MCDM tool when solving eight production decision problems, namely grinding level, material depletion. All exams have the ability to sort out difficulties and shortcomings precisely this way. The WASPAS effect of the parameter on ranking performance is also investigated [1]. The Waspas method is a technique used in many decision problems and contexts and has been improved using extensions. Begonias et al. (2013) proposed a multi-criteria selection process based on the WASPAS method to select the best version construction net side for a deep water port. Hashemkhani Salami et al. (2013) developed an approach for decision making using WASPAS methods using swarm hierarchical weighted estimation ratio analysis and multiple criteria to solve the shopping mall location problem. Confirming the robustness of Waspish and Moore multi-objective optimization methods based on ratio analysis. (2013b) used some WASPAS method in public and commercial to assess building facades [2]. In recent years total product evaluation (WASPAS) and fuzzy extensions have been discussed. The new MCDM is called the total product assessment determining utility approach (WASPAS). WASPAS was recommended for the first time in 2012 It is the strongest of the deterministic approaches for new MCDM applications. This approach is a weighted one-product version (WPM) and a weighted sum model (WSM) has been proposed and argued that the accuracy of this approach is stronger than wpm and WSM [3]. WASPAS is fuzzy using Formal Ordered Numbers (OFNS), which is proposed as an extension of the fuzzy set approach. The concept of OFNS was introduced. As opposed to fuzzy numbers, arithmetic in this model is operations on real numbers, which are a special case of OFNS. The Vaspass approach was developed by WASPAS method precision is the amount of weighted product samples used, or weighted, than the recommended product sample, which is favorable. Current literature fails to consider OFNS in the ambiguous WASPAS mode and lacks unifying research in one of the above-mentioned modes [4]. The Weighted Aggregate Product Assessment (WASPAS) method is used to assess the outcomes of the program and the adverse risks. This method is efficient and more accurate compared to independent ranking methods.

3. RESULT AND DISCUSSIONS

TABLE 1. Data set

DATA SET							
	PH	**TDS**	**TH**	**SULPHATE**	**CHLORIDE**	**CALCIUM**	**MAGNESIUM**
Pennagaram Taluk	6.8	650	226	64	210	68	158
Pappireddipatti Taluk	7.2	1578	354	125	367	168	267
Palacode Taluk	8.1	720	550	79	249	345	395
Nallampalli Taluk	6.9	1530	457	85	371	287	224
Karimangalam Taluk	7.4	896	378	139	423	329	382
Harur Taluk	7.6	974	568	97	394	72	445
Dharmapuri Taluk	8.2	1253	608	168	450	91	249

Table 1 shows the groundwater Alternative: PH, TDS, TH, SULPHATE, CHLORIDE, CALCIUM, and MAGNESIUM. Evaluation Preference: Pennagaram Taluk, Pappireddipatti Taluk, Pala code Taluk, Nallampalli Taluk, Karimangalam Taluk , Harur Taluk, Dharmapuri Taluk to calculate the final value.

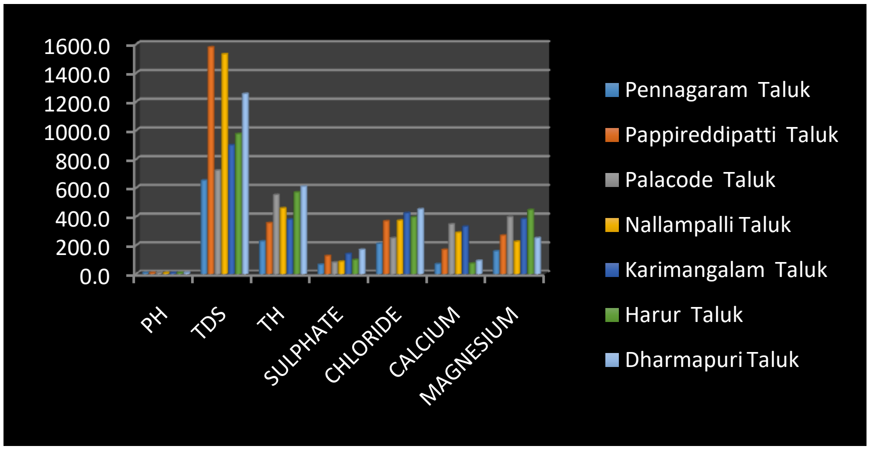

FIGURE 1. Groundwater Alternative

Figure 1 shows the groundwater Alternative: PH, TDS, TH, SULPHATE, CHLORIDE, CALCIUM, and MAGNESIUM. Evaluation Preference: Pennagaram Taluk, Pappireddipatti Taluk, Pala code Taluk, Nallampalli Taluk, Karimangalam Taluk , Harur Taluk, Dharmapuri Taluk to calculate the final value.

TABLE 2. Performance value

Performance value						
0.82927	0.41191	0.37171	0.38095	0.46667	0.19710	0.35506
0.87805	1.00000	0.58224	0.74405	0.81556	0.48696	0.60000
0.98780	0.45627	0.90461	0.47024	0.55333	1.00000	0.88764
0.84146	0.96958	0.75164	0.50595	0.82444	0.83188	0.50337
0.90244	0.56781	0.62171	0.82738	0.94000	0.95362	0.85843
0.92683	0.61724	0.93421	0.57738	0.87556	0.20870	1.00000
1.00000	0.79404	1.00000	1.00000	1.00000	0.26377	0.55955

Table 2 shows the Performance value Alternative: PH, TDS, TH, SULPHATE, CHLORIDE, CALCIUM, and MAGNESIUM. Evaluation Preference: Pennagaram Taluk, Pappireddipatti Taluk, Pala code Taluk, Nallampalli Taluk, Karimangalam Taluk , Harur Taluk, Dharmapuri Taluk to calculate the is divided by the maximum of the given value

TABLE 3. Weight

Weight						
0.25	0.25	0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.25	0.25	0.25
0.25	0.25	0.25	0.25	0.25	0.25	0.25

Table 3 shows the weight of the groundwater the weight is equal for all the value in the set of data in the table 1. The weight is multiplied with the previous table to get the next value.

TABLE 4. Weighted normalized decision matrix WSM

Weighted normalized decision matrix						
0.20732	0.10298	0.09293	0.09524	0.11667	0.04928	0.08876
0.21951	0.25000	0.14556	0.18601	0.20389	0.12174	0.15000
0.24695	0.11407	0.22615	0.11756	0.13833	0.25000	0.22191
0.21037	0.24240	0.18791	0.12649	0.20611	0.20797	0.12584
0.22561	0.14195	0.15543	0.20685	0.23500	0.23841	0.21461
0.23171	0.15431	0.23355	0.14435	0.21889	0.05217	0.25000
0.25000	0.19851	0.25000	0.25000	0.25000	0.06594	0.13989

Table 4 Shows weight and performance value in table 2 and table 3.

TABLE 5 .Weighted normalized decision matrix

Weighted normalized decision matrix						
0.95428	0.80113	0.78082	0.78563	0.82652	0.66630	0.77192
0.96801	1.00000	0.87352	0.92875	0.95031	0.83536	0.88011
0.99694	0.82188	0.97525	0.82809	0.86248	1.00000	0.97064
0.95776	0.99231	0.93111	0.84339	0.95288	0.95503	0.84231
0.97466	0.86806	0.88797	0.95373	0.98465	0.98820	0.96256
0.98118	0.88637	0.98313	0.87170	0.96732	0.67589	1.00000
1.00000	0.94398	1.00000	1.00000	1.00000	0.71665	0.86489

Table 5 shows the weighted normalization decision matrix it is calculated by multiplying the weight and performance value in table 2 and table 3.

TABLE 6. Preference Score WSM &WPM

WPM Weighted Product Model	**WSM Weighted Sum Model**
Preference Score	**Preference Score**
0.19936	0.75317
0.54869	1.27671
0.55395	1.31497
0.57209	1.30709
0.67109	1.41785
0.48729	1.28498
0.58510	1.40434

Table 6 shows the preference score of WSM Weighted Sum Model it is calculated by the sum of the value on the row of weighted normalized decision matrix the preference score of WPM Weighted Product Model it is calculated by the product of the value on the row on weighted normalized decision matrix.

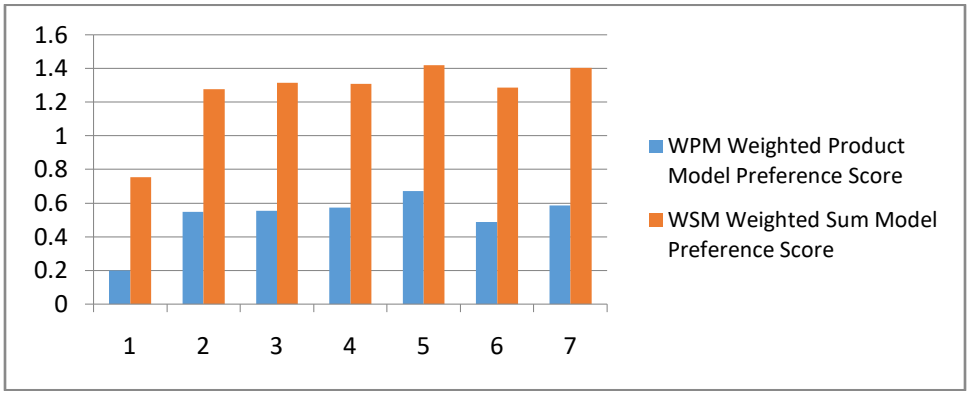

FIGURE 2.Preference Score WSM & WPM

Figure 2 shows the preference score of WSM Weighted Sum Model it is calculated by the sum of the value on the row of weighted normalized decision matrix the preference score of WPM Weighted Product Model it is calculated by the product of the value on the row on weighted normalized decision matrix.

TABLE 7.WASPAS Coefficient

lambda	**WASPAS Coefficient**
0.5	
	0.47626
	0.91270
	0.93446
	0.93959
	1.04447
	0.88613
	0.99472

Table 9 shows the WASPAS Coefficient value lambda 0.5

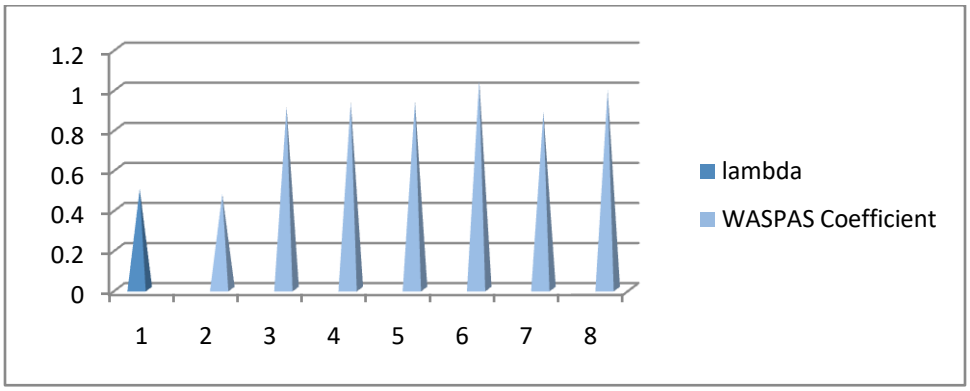

FIGURE 3.WASPAS Coefficient

Figure 3 shows the WASPAS Coefficient value lambda 0.5

TABLE 8.Ranks

	Rank
Pennagaram Taluk	7
Pappireddipatti Taluk	5
Palacode Taluk	4
Nallampalli Taluk	3
Karimangalam Taluk	1
Harur Taluk	6
Dharmapuri Taluk	2

Table 10 shows the best Employees the final result of this paper the Pennagaram Taluk is in 7th rank, the Pappireddipatti Taluk is in 5th rank, the Palacode Taluk is in 4 th rank, the Nallampalli Taluk is in 3 rd rank, the Karimangalam Taluk is in 1 st rank the Harur Taluk is in 6 th rank, the Dharmapuri Taluk is in 2nd rank. The final result is done by using the WASPAS method.

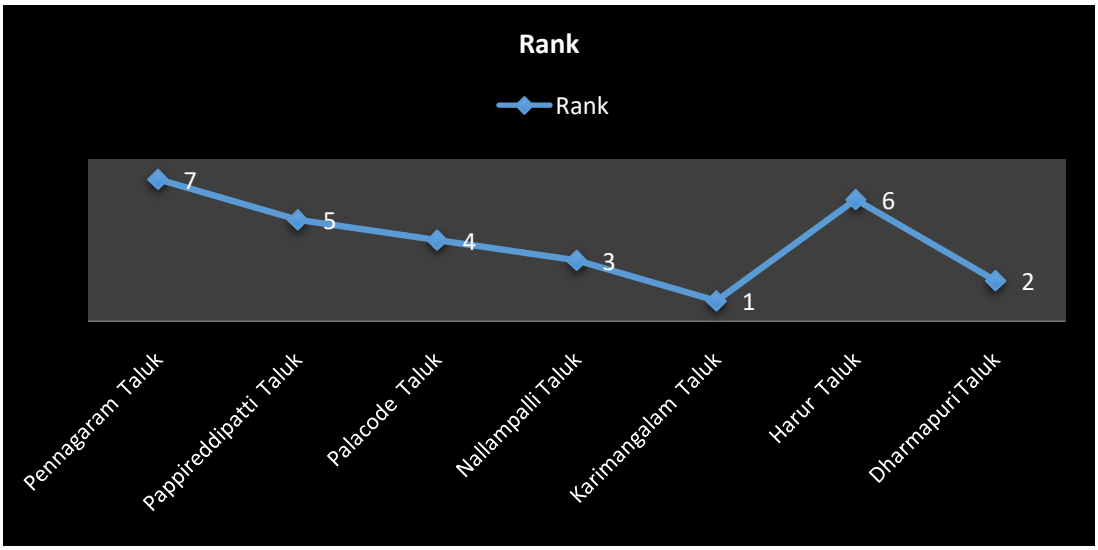

FIGURE 4. Rank

Figure 4 shows the best Employees the final result of this paper the Pennagaram Taluk is in 7th rank, the Pappireddipatti Taluk is in 5th rank, the Palacode Taluk is in 4 th rank, the Nallampalli Taluk is in 3 rd rank, the Karimangalam Taluk is in 1 st rank the Harur Taluk is in 6 th rank, the Dharmapuri Taluk is in 2nd rank. The final result is done by using the WASPAS method.

3. CONCLUSION

Tamil Nadu, Dharmapuri District, Domestic and Water quality for irrigation purposes to assess water quality survey has been carried out. PH, TDS, TH, Calcium, Magnesium, Chloride, Sulphate. This paper notes that increasing levels of water pollution, the resulting billion-dollar utility and with control schemes, it provides a way to measure and evaluate the quality of given water body Development of water quality codes is necessary. The data output of current water monitoring stations is huge and Dimensional reporting units are different and Not integrated in a straightforward algebraic way, even by scientifically trained users have few means of integrating the data to provide; water quality. That quality is locally better than hook and line to be broadly defined, Because of the importance of downstream streams less emphasized in that context. The stream is never fishable However, it is an integral part of the watershed; Protection is essential if downstream streams are to remain fishable and swimmable. The Clean Water biological integrity mandate without considering local streams separately, It depends on the overview of the entire hydrological system at the water table level. Agricultural waste, applied fertilizers, soil leach ate, urban waste, Cattle excreta and sewage Sources of poor water quality. Some models have hardness and due to magnesium concentration are highly saline not suitable for irrigation purposes. In general, ground water farming activities of Dharmapuri district, anthropogenic activities, ion exchange and Contaminated by weather. The socio-economic well-being of the people of Tamil Nadu is significantly affected by groundwater, which is the third largest supply of fresh water in the world after glaciers and polar ice. Groundwater is used for domestic, horticultural, agricultural and hydroelectric purposes. It takes into account the intrinsic quality of groundwater, atmospheric inputs, weathering of soils and rocks, and human activity to determine whether it is suitable for use for various purposes. Degradation of surface and ground water is caused by public ignorance of environmental and related approaches, growing indiscriminate dumping of anthropogenic waste, improper pesticide use and inadequately treated sewage discharge. Groundwater is Valuable due to its wide occurrence, availability and consistently high quality. Once pollution penetrates the underground environment, it spreads over large areas of groundwater and goes unnoticed for long periods of time, making groundwater resources unfit for human consumption and otherwise. The source of water, how much it evaporates, the types of rocks and minerals, and how long it interacts with reactive minerals all affect hydrochemistry to determine whether water is suitable for different uses, it is important to assess its quality. Urban aquifers are the only natural source of drinking water supply and are often considered less suitable for this purpose. This has led to a crisis based on scarcity of drinking water, which is highly polluted and less transportable. Anywhere groundwater is used for irrigation and drinking water needs, understanding hydrochemistry is critical to

determining water quality. WASPAS was recommended for the first time in 2012 It is the strongest of the deterministic approaches for new MCDM applications. This approach is a weighted one-product version (WPM) and a weighted sum model (WSM) has been proposed and argued that the accuracy of this approach is stronger than wpm and WSM [3]. The final result is done by using the WASPAS method. Ground Water quality the Highest influence it is seen that Karimangalam Taluk showing the highest value for Pennagaram Taluk showing the lowest value.

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