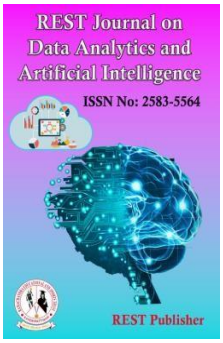
REST Journal on Data Analytics and Artificial Intelligence

Vol: 2(2), June 2023

REST Publisher; ISSN: 2583-5564

Website: http: //restpublisher.com/journals/jdaai/

DOI: https://doi.org/10.46632/jdaai/2/2/2



Analysis of Animal Husbandry Instructions in Green House gas using Fuzzy TOPSIS Method

*** Chinnnasami Sivaji, M. Ramachandran, Vidhya Prasanth**

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

*Corresponding Author Email: chinnasami@restlabs.in

Abstract: *Animal husbandry is part of agriculture a branch where animals raised, raised and meat, fiber, eggs, milk and other food are grown for goods. Animal husbandry is livestock cultivated and selected means reproduction. It is the management of animals and observation is, in which the genome of Animals qualities and behavior more are created for profit. A large number of farmers raise livestock they live by faith. Animals having high nutritional values various food items provide us. Therefore, they need a lot of care and attention. Fuzzy TOPSIS method, a more classical MCDM one of the methods is known as and developed by lee, the basic concept of this method that is, the selected alternatives from the positive ideal solution a very short distance is also negative far from ideal should be solution. Alternative: food, price, antibiotics, agriculture land. Evaluation preference: poultry husbandry, cows husbandry, sheep husbandry, pig's husbandry, horses husbandry. From the result it is seen that cows husbandry is got the first rank where as is the horses husbandry is having the lowest rank.*

Keywords: *MCDM,* Poultry husbandry, Cows husbandry, Sheep husbandry, Pig's husbandry, Horses husbandry

1. INTRODUCTION

Animal husbandry is domestic controlled farming of animals, management and production, as well as through reproduction considered desirable by humans defined as improving properties. It is the state of the art in animal husbandry is proper. World population is increasing comes, and animal and a plant-based diet demand for goods is also increasing is coming meet such requirement to do, animal husbandry practice it comes in the picture. Animal husbandry, animal care, breeding and strict in management etc holds the test. Cattle farming are a huge industry. Animals are born, raised, specially made for them are kept on the farm or place. Poultry farming, dairy farms, apiculture (beekeeping), aquaculture and other related activities all are of animal husbandry examples. Animal products, utensils and more about the benefits and types of animal husbandry check the article to know. Animal husbandry is for meat, fiber, milk or other products relating to domesticated animals it is a branch of agriculture. Daily maintenance, selective breeding and raising livestock this includes animals first beginning with the Neolithic revolution, domesticated 13,000 by, to the cultivation of the first crops the former has a long history. As early like ancient Egypt during civilizations, cattle, sheep, goats and pigs were raised on farms. Mitigation strategies for NH3 CH4 in animal husbandry has no effect on emissions N- and C-cycles in agriculture being only partially integrated, to mitigate the consequence this is because the paths are different is important. Methane emission reduction optional animal nutrition (enteric fermentation) and animal compost management indoors or outdoors on should be based [1]. Animal husbandry is semi natural in Europe man-made like grasslands to manage created habitats is used. Of essential literature from review, traditional vet tamed by domesticated humans' loss of natural processes i guess that makes up for it somewhat. There with natural processes similarities are rarely recognized, however, traditional animal husbandry importance as a security tool underrated. North and central in traditional animal husbandry in Europe the methods used are biodiversity maintenance and other harmful effects many human mitigations of human effects repressive and critical nature i would change the processes somewhat i guessed. Natural disturbances and livestock similarities between effects of acculturation because, traditionally managed habitats many features of primitive habitats may have modern agriculture in general for intensive methods and biodiversity due to the use of harmful mineral fertilizers, for that and traditional animal husbandry a clear distinction must be made between want i am a traditional livestock breeder grazing, mowing and other methods (plowing and excluding sowing) before the industrial revolution for animals in the manner created i

provide food, fences and shelter [2]. Production in modern animal husbandry improve performance, etc for decades, antibiotics have been adjuncts therapeutic doses of food animals application in feeds is a common practice. Prevent animals from diseases; structure of prebiotics and between physiological function since the correlation is not clear, the effectiveness of prebiotics varies from animal to animal with species, ages and physical conditions always varies. Sometimes, reciprocally hostility ensues. Additionally, prebiotic the highest cost of production is cattle restricts their use in aquaculture [3]. These inventions are animal husbandry microbes as growth promoters in the field for commercial use by opponents led to for example, studies of china in animal husbandry activities more around involved areas antibiotic residue levels shown and for the environment 84% of total antibiotic excretion derived from farm animals. States food and drug administration (FDA) united in animal husbandry to limit antibiotic use new regulations have been imposed. Cattle promotes growth in breeding clinically important for purposes antibiotics are prohibited [4]. The animal facility after the scientist completed the study in the correspondence manuscript cultivation to be included ask for details, test animal husbandry in design perfect for related issues that is not given importance obvious. Agree otherwise if not taken, all amenities their own animal care follow procedures, they are may not be relevant or personal best choices for studies may be inclusive [5]. Used in farm animal husbandry due to the development of technology, animal's household appliances learn more about. For example, pigs are electronic from food stalls learn to feed and milk an automatic milking machine for cows you should get used to milking method. However, only a few studies are available, including for home appliances the adaptation process is monitored in detail [6]. Animal husbandry is an example. In recent years, for this sector change substantial is involved under pressure. Until 1997, severe along with regulatory policies and through spurred technological innovation these problems can be solved by adaptation it was generally assumed that in the field of animal husbandry, actors formerly very different than used to accommodate the challenges trying to realize structural changes as can be seen, the consistency at the same time leading to a change towards inspired by the view. They work from the established framework to do face obstacles and opposition [7]. Microbes in feed in animal husbandry campaigns to eliminate opponents increasingly speeding up around the world are coming animal husbandry and of probiotics in veterinary practice studies evaluating the intervention were included. Safety for a common probiotic candidate study in ethics and general microbes in feed in health negative influence of opponents' studies on are also included [8]. Additionally, the environment of animal husbandry based on following principles sustainable management of rangelands by, this fragile and eco-environment from ecoregions provision of system services (ESS). Can be strengthened. Animal husbandry of livestock in the environment by method adverse effects occur because animals' other agriculture and forestry not integrated with the underlying practices [9]. Infectious diseases, especially zoological noses and cattle more antibiotics in production uses include antibiotic resistance and from animals to humans' risks that contribute to the spread include: on the other hand, brucellosis, tuberculosis, leptospirosis and bse including many of animals and humans' infectious diseases have been eradicated the result is animal husbandry today not as safe. So many even if the health risks are brought under control, related to animal husbandry potential and residual public health risks officers and producers in dealing of anxiety and distrust public opinion reflects the sentiment. These risks are mostly from animal production are related to severity, however are actually real. Humans and "absolutely" safe for animals and for healthy animal husbandry, design of animal husbandry systems and disease prevention needs an important role in management [10]. So, in the animal production sector our own to meet the challenge we started to develop the approach. Following wijfels' advice, voiced by many in the field, we have animal husbandry methods we focused on redesign. Rio is the new sustainable animal husbandry design of methods and practices the development of these new designs it also seeks to incorporate motivational efforts. As for the latter, tinkering, of learning and further development MLB tells us that there is a need [11]. In the exhaust air methane removal of animal housing and compost storage are greens from animal husbandry one that reduces greenhouse gas emissions has great potential. The objective of the study is full-scale livestock production for methane removal at the station designing a bio filter [12]. Various animal husbandry animal husbandry processes summarize valuable experience basically animal identification uniquely identifying internet and electronic technology the animal is to realize the combination of breeding and livestock web is a management system. It is the resources of national agricultural development integration and system integration" follows the guidelines. The internet of animal care (IOT) is the largest sensors an observatory with nodes is the network. It is various collects information through sensors [13]. Agriculture or agriculture means cultivation of plants and animals. Animal husbandry water footprint. Cattle the rearing water footprint is forage and plant production such as grain all livestock production including attachments total water consumed by connections is the source. To treat medical ailments, prevent common disease occurrences control and animal in food animals to promote growth antibiotics are used. Cultivation should show immediate profitability twenty according to population growth doubling production in years a challenge. Poultry farming is a form of animal husbandry, this includes chickens, ducks, turkeys and domesticated birds like ducks producing meat or eggs for food nurtures to do. Cattle cultivation and domestication agricultural activity it is called animal husbandry. Livestock is for human consumption or breeding produced for profit refers to animals. Sheep domesticated or sheep husbandry is the rearing of domestic goats and nurturing.

This is animal husbandry a branch. Pig farming pig cultivation is diversified and intensive suitable for agriculture. Horses are optional pastures and, in forests, open adapted to live in plains or mountains.

2. FUZZY TOPSIS

An important one in gran canaria of three hotels of the corporation service quality changes fuzzy TOPSIS for evaluation land by approach studies. Fuzzy TOPSIS method is alpha based on levels and non-linear programming solution provides process. Supply chain supplier selection problem in the system fuzzy topsys approach to with deal [14]. TOPSIS is widely used as a decision-making technique, fuzzy TOPSIS or group fuzzy for reliable version of TOPSIS more intensive to achieve this goal research, comparisons and benchmarking we still need that process we believe. Finally, the z-number or ambiguous mixed number in an essay is used. Such limited efforts to extend the TOPSIS is kind of vague useful? Readers or not does not allow you to make a firm decision [15]. Fuzzy TOPSIS methods are sufficient are capable because fuzzy positive-best solution and a fuzzy negative-best solution to get the, ambiguous fuzzy ranking approaches are used. Ella in cases and circumstances satisfying numbers. The best solution and from the negative-best solution calculating distance is difficult. In fuzzy decision making to solve these problems, a new ambiguity a TOPSIS approach is proposed [16]. Fuzzy TOPSIS method. Through unity for a better solution (TOPSIS). Technique for order prioritization hwang et started by yoon. This technique is the best alternative excellent for all properties considered has position, whereas negative is better all bad attribute values based on the idea that to solve the limitations, robot selection the TOPSIS method is ambiguous for the problem recommended, there are different criteria and different subjectivity ratings are below by triangular fuzzy numbers of the various alternatives mentioned evaluated on linguistic basis [17]. To solve these problems, plant location a fuzzy for selection problems a TOPSIS approach is recommended. A better solution for order priority by similarity technique initiated by hwang and yoon, this technique is the best alternative for all attributes the idea that there is a better position based on, whereas excellent for all attributes the idea that there is an alternative better position based on, whereas a negative ideal is all bad. Attribute values. A topsys solution is the only from the negative-ideal far away in time and as the closest substitute to the best substitute is defined. In fuzzy TOPSIS, attribute values are represented by fuzzy numbers [18]. For ideal solution in fuzzy environments (TOPSIS) a technique for similarity order preference, i.e. Fuzzy TOPSIS, in many practical, real-world challenges used successfully. This paper is about fuzzy TOPSIS applications provides a brief review. Of the 25 studies conducted in the years 2009 - 2018 basically this research has been carried out. Most related to fuzzy TOPSIS technique relevant and highly cited provides a brief review. Applications such as resources, business, healthcare etc classified into parts. Fuzzy TOPSIS implementations, fuzzy set, non-hesitant fuzzy set or intuition fuzzy, like a fuzzy set by other methods combined with TOPSIS, the approaches used are examined and compared [19]. TOPSYS uses traditional one of the multi-criteria decision-making methods is that of hwang and yoon (1981). Created by chosen from alternative positive ideal solution (PIS) a very short distance is negative away from best solution (NIS). It is based on idea of having to be located. TOPSIS is easy to understand and programmable computing also provides process. With different units simultaneously taking into account various criteria has the ability to absorb. Many obscure TOPSIS in recent years have been created. First install obscure TOPSYS they used ambiguous numbers has the ability to absorb [20]. Among many popular MCDM methods, by corresponding to the best solution technique for order performance (TOPSIS) stands for euclidean distances many possible by measuring and to rank the alternatives to select the technique practical and useful the way TOPSIS was originally developed by hwang and yoon (1981) created by. Created by chosen from alternative positive ideal solution (pis) the concept of having a very short distance based on and negative ideal solution (NIS) is far from distance, cost criterion solution, benefit criteria increases and decreases [21]. Additionally, by different distance measurements value of the given interval ambiguous TOPSIS results a comprehensive examination of observations analysis is presented. Distance from each distance measure comparison of valued fuzzy TOPSIS rankings analysis, stability ratios, odds ratios and mean spearman with discussions of correlation coefficients explained. In solving a plant design problem. The difference between is mainly evaluation is in approaches. Accurate fuzzy numbers instead of numbers by using, various depending on the attributes, of the attribute's importance and effectiveness of alternatives the merit of fuzzy TOPSIS are to provide [22]. To solve mara's WD problem a fuzzy MCDM called fuzzy topsis we have used the method. Some fuzzy MCDM methods and fuzzy a brief overview of TOPSIS and applications are also provided in this section. All evaluations in fuzzy TOPSIS weights are also by linguistic variables are defined. Triantafillo and lin (1996) are ambiguous TOPSIS developed the system, in which each relative proximity to replacement is ambiguous evaluated based on of arithmetic operations. Liang (1999) for the ideal and ideal based on opposing views proposed fuzzy MCDM. Chen (2000) triangulation treated as fuzzy numbers and TOPSIS method for fuzzy GDM situations between two fuzzy numbers to extend defined smooth Euclidean distance [23]. Linguistic preferences, in fuzzy TOPSIS easily as fuzzy numbers can be converted and used in calculations. Simple and fast calculations and tolerance of uncertainty some great features like handling by having, energy planning many ambiguous problems to solve TOPSIS applications

have been used [24]. Fuzzy topsis method alpha condition sets and fuzzy extensions it is based on principle, which models non-linear programming of each alternative by solving also calculates fuzzy relative proximity. Decomposing fuzzy relative closeness values the final ranking is obtained by in this paper, interval to solve MCDM problems value fuzzy TOPSIS (IVF-TOPSIS) we develop, performance appraisal in this of values and criteria weights are linguistic terms, which space-valued ambiguity (IVFN) can be expressed in numbers [25]. Then fuzzy TOPSIS method introduced. Structure and the strength of both methods efficiency in the dairy sector the real of a company that works tested by application to case. Fuzzy logic and TOPSIS method quantitative details about are described in the appendix [26]. This research is fuzzy TOPSIS weight of each criterion acceptance as a deterministic analytical tool. Ambiguity theory uncertainty and perfect for dealing with complex situations provides the tool. MCDM problems solving fuzzy sets basically fuzzy TOPSIS method is the purpose of this article use according to our research results, shopping to improve the competitive advantage of the website the most important factors are security and trust [27].

3. ANALYSIS AND DISCUSSION

Food it is seen that Cows husbandry is showing the highest value for Horses husbandry is showing the lowest value. Water it is seen that Cows husbandry is showing the highest value for Horses husbandry is showing the lowest value. Antibiotics it is seen that Cows husbandry is showing the highest value for Poultry husbandry is showing the lowest value. Agriculture Land it is seen that Cows husbandry is showing the highest value for Pig's husbandry is showing the lowest value.

TABLE 1. Animal Husbandry

	Food	**water**	**Antibiotics**	**agriculture Land**
Poultry husbandry	61.08	169.53	19.15	38.05
Cows husbandry	89.12	192.97	33.69	47.30
Sheep husbandry	74.08	142.58	29.18	33.10
Pig's husbandry	63.17	128.28	24.60	27.59
Horses husbandry	58.33	106.41	27.96	35.89

Table 1 shows the Animal Husbandry of the Alternative: Food, water, Antibiotics, and agriculture Land. Evaluation Preference: Poultry husbandry, Cows husbandry, Sheep husbandry, Pig's husbandry, Horses husbandry.

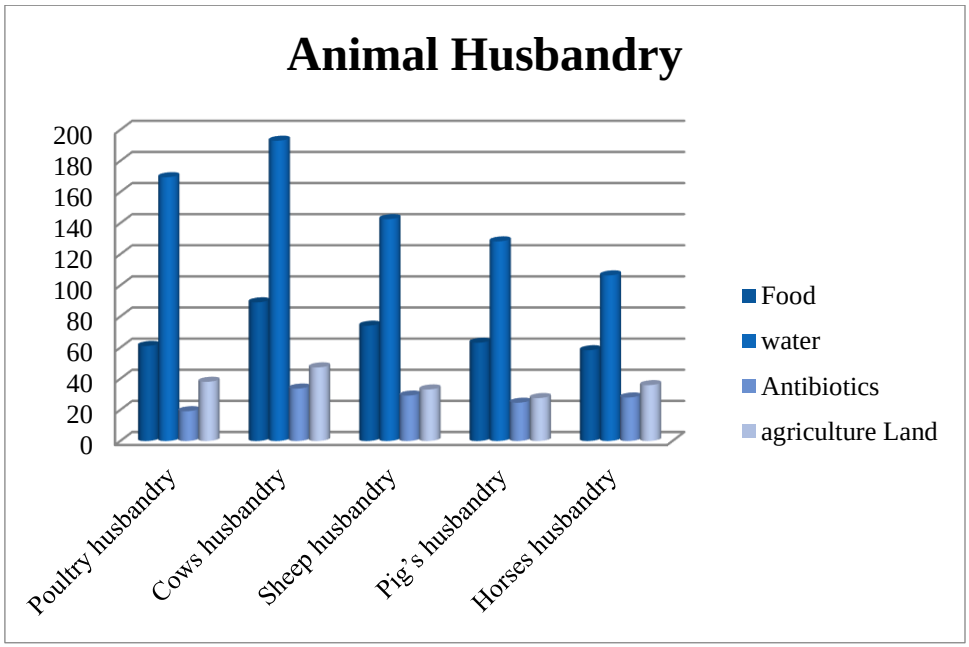


FIGURE 1. Animal Husbandry

Figure 1 shows the graphical representation of the Alternative: Food, water, Antibiotics, and agriculture Land. Evaluation Preference: Poultry husbandry, Cows husbandry, Sheep husbandry, Pig's husbandry, Horses husbandry.

TABLE 2. Squire Rote of matrix

3730.7664	28740.4209	366.7225	1447.8025
7942.3744	37237.4209	1135.0161	2237.2900
5487.8464	20329.0564	851.4724	1095.6100
3990.4489	16455.7584	605.1600	761.2081
3402.3889	11323.0881	781.7616	1288.0921

Table 2 shows the Squire Rote of matrix value.

TABLE 3. Fuzzy Significance

Importance	**Symbol**	**l**	**m**	**u**
Extremely low	EL	0	0	0.1
very low	VL	0	0.1	0.3
low	L	0.1	0.3	0.5
medium	M	0.3	0.5	0.7
high	H	0.5	0.7	0.9
very high	VH	0.7	0.9	1
Extremely high	EH	0.9	1	1

Table 3 shows the Fuzzy Significance Collect the subjective evaluations of the decision maker on the importance of weights. Calculate the fuzzy significance coefficients or weights based on the decision maker's subjective evaluations by using following table and equations.

TABLE 4. The criteria on a linguistic scale

	DM1	**DM2**	**DM3**
Food	EH	VL	M
water	L	EH	VH
Antibiotics	L	M	VH
agriculture Land	L	M	VL

Table 4 shows the criteria on a linguistic scale.

TABLE 5. Convert linguistic ratings of decision makers into quantative values by using the selected fuzzy number

	DM1			**DM2**			**DM3**		
Food	0.9	1	1	0	0.1	0.3	0.3	0.5	0.7
water	0.1	0.3	0.5	0.9	1	1	0.7	0.9	1
Antibiotics	0.1	0.3	0.5	0.3	0.5	0.7	0.7	0.9	1
agriculture Land	0.1	0.3	0.5	0.3	0.5	0.7	0	0.1	0.3

Table 5 shows the Convert linguistic ratings of decision makers into quantative values by using the selected fuzzy number**.**

TABLE 6. Calculate aggregated Fuzzy weights

	L-FW	**M-FW**	**U-FW**
Food	0.40	0.53	0.67
water	0.57	0.73	0.83
Antibiotics	0.37	0.57	0.73
agriculture Land	0.13	0.30	0.50

Table 6 shows the Calculate aggregated Fuzzy weights food, water, Antibiotics, agriculture Land.

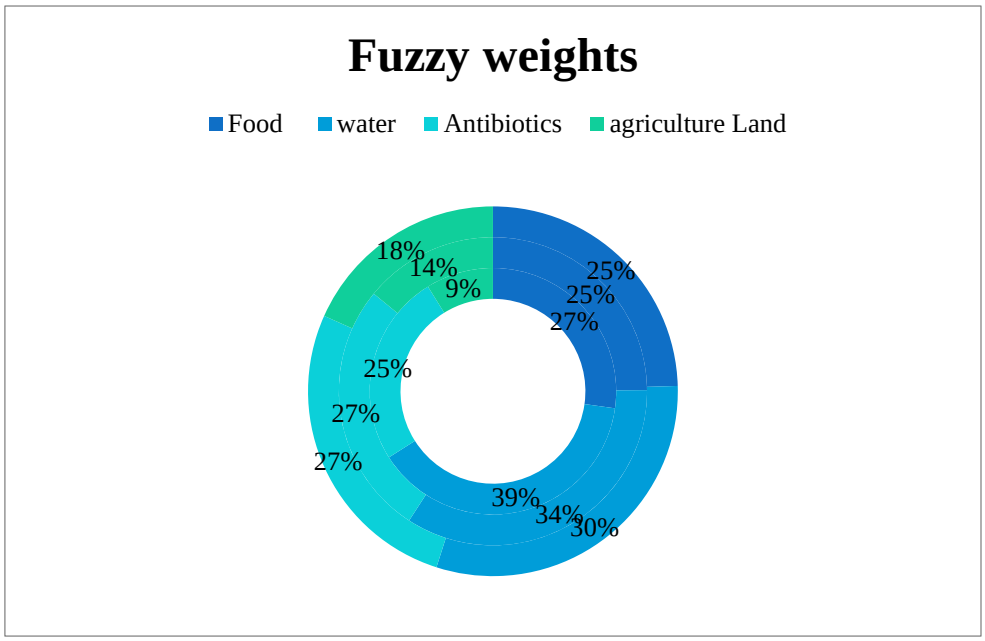


FIGURE 2. Fuzzy weights

Figure 2 shows the graphical representation the aggregated Fuzzy weights food, water, Antibiotics, agriculture Land.

TABLE 7. Normalized Data

Normalized Data			
Food	**water**	**Antibiotics**	**agriculture Land**
0.3898	1.0819	0.3131	0.4604
0.5687	1.2315	0.5509	0.5723
0.4728	0.9099	0.4771	0.4005
0.4031	0.8187	0.4022	0.3338
0.3722	0.6791	0.4572	0.4343

Table 7 Normalized Data shows the Alternative: Food, water, Antibiotics, agriculture Land. Evaluation Preference: Poultry husbandry, Cows husbandry, Sheep husbandry, Pig's husbandry, Horses husbandry. The Normalized data is calculated from the data set value is divided by the sum of the square root of the column value.

TABLE 8. Weighted normalized decision matrix

Food			water			Antibiotics			agriculture Land		
0.1559	0.2079	0.2599	0.6131	0.7934	0.9016	0.1148	0.1774	0.22963	0.0614	0.1381	0.2302
0.2275	0.3033	0.3792	0.6978	0.9031	1.0262	0.202	0.3122	0.40398	0.0763	0.1717	0.2862
0.1891	0.2521	0.3152	0.5156	0.6673	0.7583	0.175	0.2704	0.3499	0.0534	0.1202	0.2003
0.1613	0.215	0.2688	0.4639	0.6003	0.6822	0.1475	0.2279	0.29498	0.0445	0.1002	0.1669
0.1489	0.1985	0.2482	0.3848	0.498	0.5659	0.1676	0.2591	0.33527	0.0579	0.1303	0.2171

Table 8 Shows the Weighted normalized decision matrix Fuzzy weighted decision matrix by multiplying the normalized matrix with corresponding fuzzy weight.

TABLE 9. A+ & A-

A+	0.227	0.303	0.379	0.698	0.903	1.026	0.115	0.177	0.23	0.045	0.10015	0.16692
A-	0.149	0.199	0.248	0.385	0.498	0.566	0.202	0.312	0.404	0.076	0.1717	0.28617

Table 9 Shows the A+ Maximum, minimum value & A- Minimum, Maximum value.

TABLE 10. FPIS

FPIS	Poultry husbandry	0.097405	0.107639	0	0.043709
	Cows husbandry	0	0	0.136807	0.082361
	Sheep husbandry	0.052246	0.231396	0.094372	0.023024
	Pig's husbandry	0.090145	0.297063	0.051279	0
	Horses husbandry	0.106958	0.397493	0.082893	0.034683

Table 10. Shows the coordinates for the fuzzy positive ideal solution (FPIS).

TABLE 11. FNIS

FNIS	Poultry husbandry	0.009553	0.289854	0.136807	0.038652
	Cows husbandry	0.106958	0.397493	0	0
	Sheep husbandry	0.054712	0.166097	0.042435	0.059337
	Pig's husbandry	0.016813	0.100429	0.085528	0.082361
	Horses husbandry	0	0	0.053914	0.047678

Table 11. Shows the coordinates for the fuzzy Negative ideal solution (FNIS).

TABLE 12. Si+ & Si-

Si+	**Si-**
0.248753	0.474866
0.219168	0.504451
0.401039	0.32258
0.438487	0.285131
0.622027	0.101592

Table 12. Shows the Euclidean distance of each alternative from positive and negative value calculated as. Where represents the distance between two fuzzy numbers calculated by S+, S- value.

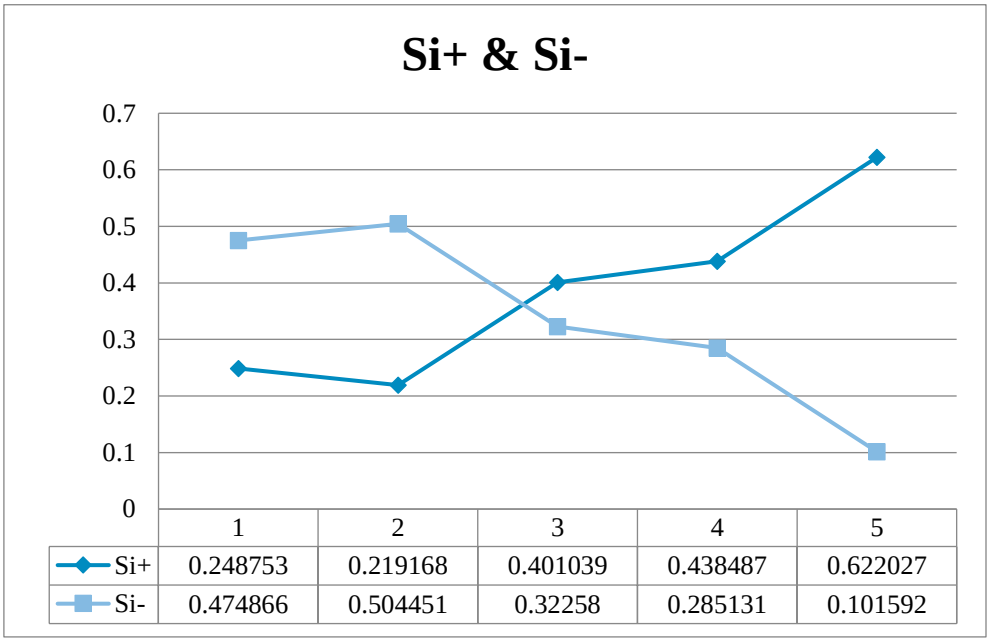


FIGURE 3. S+&S-

Figure 3 shows the graphical representation S+, S- value.

TABLE 13. Rank

	CCi	Rank
Poultry husbandry	0.656238	2
Cows husbandry	0.697122	1
Sheep husbandry	0.445787	3
Pig's husbandry	0.394035	4
Horses husbandry	0.140394	5

Table 13 shows the closeness coefficient CCi of the alternatives are calculated using equation ranked as per descending order. the final result of this paper the Poultry husbandry is in 2nd rank, the Cows husbandry is in 1st rank, the Sheep husbandry is in 3rd rank, the Pig's husbandry is in 4th rank and the Horses husbandry is in 5th rank. The final result is done by using the Fuzzy TOPSIS method.

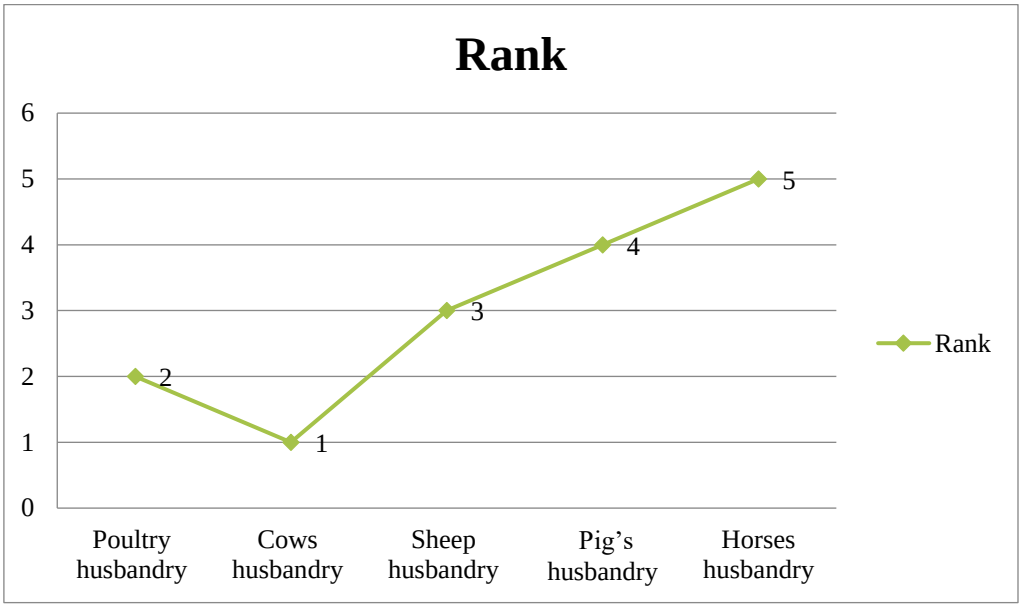


FIGURE 4. Rank

Figure 4 shows the graphical representation view the Poultry husbandry is in Second rank, the Cows husbandry is in First rank, the Sheep husbandry is in Third rank, the Pig's husbandry is in Fourth rank and the Horses husbandry is in Fifth rank.

4. CONCLUSION

Animal husbandry is livestock cultivated and selected means reproduction. It is the management of animals and observation is, in which the genome of animal's qualities and behavior more are created for profit. A large number of farmers raise livestock they live by faith. Animals having high nutritional values various food items provide us. Therefore, they need a lot of care and attention. Fuzzy TOPSIS method, a more classical MCDM one of the methods is known as and developed by lee, the basic concept of this method that is, the selected alternatives from the positive ideal solution a very short distance is also negative far from ideal should be solution. The final result of this paper poultry husbandry is in second rank, the cow's husbandry is in first rank, the sheep husbandry is in third rank, the pig's husbandry is in fourth rank and the horse's husbandry is in fifth rank.

REFERENCES

[1]. Monteny, Gert-Jan, Andre Bannink, and David Chadwick. "Greenhouse gas abatement strategies for animal husbandry." Agriculture, Ecosystems & Environment 112, no. 2-3 (2006): 163-170.

[2]. Pykälä, Juha. "Mitigating human effects on European biodiversity through traditional animal husbandry." Conservation Biology 14, no. 3 (2000): 705-712.

[3]. Cheng, Guyue, Haihong Hao, Shuyu Xie, Xu Wang, Menghong Dai, Lingli Huang, and Zonghui Yuan. "Antibiotic alternatives: the substitution of antibiotics in animal husbandry?." Frontiers in microbiology 5 (2014): 217.
[4]. N. Valecha, "Transforming human resource management with HR analytics: A critical Analysis of Benefits and challenges", IJGASR, vol. 1, no. 2, pp. 56–66, Jun. 2022.
[5]. Low, Chuen Xian, Loh Teng-Hern Tan, Nurul-Syakima Ab Mutalib, Priyia Pusparajah, Bey-Hing Goh, Kok-Gan Chan, Vengadesh Letchumanan, and Learn-Han Lee. "Unveiling the impact of antibiotics and alternative methods for animal husbandry: A review." Antibiotics 10, no. 5 (2021): 578.
[6]. Goswami, Chandrashekhar, and Rahul Shahane. "Transport Control Protocol (TCP) enhancement over wireless environment: Issues and challenges." In 2017 International Conference on Inventive Computing and Informatics (ICICI), pp. 742-749. IEEE, 2017.
[7]. Chandran Subramani, M. Ramachandran, Chinnasami Sivaji, Kurinjimalar Ramu , "Environmental Impact Assessment of Using Decision Making trial and Evaluation Laboratory (DEMATEL) Method", Journal on Materials and its Characterization, 1(1), (2022):6-16.
[8]. Soni, Rajkumar, Prasun Chakrabarti, Zbigniew Leonowicz, Michał Jasiński, Krzysztof Wieczorek, and Vadim Bolshev. "Estimation of life cycle of distribution transformer in context to furan content formation, pollution index, and dielectric strength." IEEE Access 9 (2021): 37456-37465.
[9]. Sharma, Bhisham, and Trilok C. Aseri. "A comparative analysis of reliable and congestion-aware transport layer protocols for wireless sensor networks." International Scholarly Research Notices 2012 (2012).
[10]. Alsubai, Shtwai, Ashit Kumar Dutta, Ahmed Hussein Alkhayyat, Mustafa Musa Jaber, Ali Hashim Abbas, and Anil Kumar. "Hybrid deep learning with improved Salp swarm optimization based multi-class grape disease classification model." Computers and Electrical Engineering 108 (2023): 108733.
[11]. Nevalainen, Timo. "Animal husbandry and experimental design." Ilar Journal 55, no. 3 (2014): 392-398.
[12]. Wechsler, Beat, and Stephen EG Lea. "Adaptation by learning: Its significance for farm animal husbandry." Applied Animal Behaviour Science 108, no. 3-4 (2007): 197-214.
[13]. Ramesh, G., Karanam Madhavi, P. Dileep Kumar Reddy, J. Somasekar, and Joseph Tan. "WITHDRAWN: Improving the accuracy of heart attack risk prediction based on information gain feature selection technique." (2021).
[14]. Bos, A. P. "Instrumentalization theory and reflexive design in animal husbandry." Social Epistemology 22, no. 1 (2008): 29-50.
[15]. Aswini, S., S. Tharaniya, RJ Joey Persul, B. Avinash Lingam, and P. Kogila. "Assessment of Knowledge, Attitude and Practice on Immunization among Primi Mothers of Children." Indian Journal of Public Health Research & Development 11, no. 3 (2020): 583-587.
[16]. Sarveshwar Kasarla, Vimala Saravanan, Vidhya Prasanth, Manjula Selvam, "The Influence of Thermoelectric Properties of Nanomaterial and Applications", Journal on Materials and its Characterization, 1(1), (2022):1-5.
[17]. Alayande, Kazeem Adekunle, Olayinka Ayobami Aiyegoro, and Collins Njie Ateba. "Probiotics in animal husbandry: Applicability and associated risk factors." Sustainability 12, no. 3 (2020): 1087.
[18]. Lal, Rattan. "Integrating animal husbandry with crops and trees." Frontiers in Sustainable Food Systems 4 (2020): 113.
[19]. Khan, Zuhaib Ashfaq, Hafiz Husnain Raza Sherazi, Mubashir Ali, Muhammad Ali Imran, Ikram Ur Rehman, and Prasun Chakrabarti. "Designing a wind energy harvester for connected vehicles in green cities." Energies 14, no. 17 (2021): 5408.
[20]. Goswami, Chandrashekhar, and Parveen Sultanah. "A Study on Cross-Layer TCP Performance in Wireless Ad Hoc Network." In International Conference on Intelligent Data Communication Technologies and Internet of Things (ICICI) 2018, pp. 56-70. Springer International Publishing, 2019.
[21]. B. Mago, K. Ishaq Almaazmi, A. Jafar Almaazmi, K. Mohammed Falaha, and E. Dahi Almidfaa, "Modeling Situational IT Ethics in UAE", IJGASR, vol. 1, no. 2, pp. 21–35, Jun. 2022.
[22]. Kumar Pandey, Rakesh, Asghar Gandomkar, Behzad Vaferi, Anil Kumar, and Farshid Torabi. "Supervised deep learning-based paradigm to screen the enhanced oil recovery scenarios." Scientific Reports 13, no. 1 (2023): 4892.
[23]. Kimman, Tjeerd, Maarten Hoek, and Mart CM de Jong. "Assessing and controlling health risks from animal husbandry." NJAS-Wageningen Journal of Life Sciences 66 (2013): 7-14.
[24]. Amol Lokhande, M. Ramachandran, Chinnasami Sivaji, Manjula Selvam, "A Study on GFRP Drilling Composites Using SPSS Statistical Analysis", REST Journal on Advances in Mechanical Engineering, 1(3), (2022):1-6.
[25]. Palanimuthu, Kogila, Birhanu Gutu, Leta Tesfaye, BuliYohannis Tasisa, Yoseph Shiferaw Belayneh, Melkamu Tamiru, and Desalegn Shiferaw. "Assessment of Awareness on COVID-19 among Adults by Using an Online Platform: 26 Countries View." Medico-legal Update 21, no. 1 (2021).
[26]. R. Rathore, "A Review on Study of application of queueing models in Hospital sector", IJGASR, vol. 1, no. 2, pp. 1–6, Jun. 2022.
[27]. Khurana, Manju, Shivendra Shivani, Shailendra Tiwari, Bhisham Sharma, Mohammad S. Obaidat, and Kuei-Fang Hsiao. "Optimized Time Synchronized Multilayer MAC Protocol for WSN Using Relay Nodes." Adhoc & Sensor Wireless Networks 48 (2020).
[28]. Elzen, Boelie, and Bram Bos. "The RIO approach: Design and anchoring of sustainable animal husbandry systems." Technological Forecasting and Social Change 145 (2019): 141-152.

[29]. Stephen, M. James, and Prasad Reddy. "Enhancing fingerprint image through ridge orientation with neural network approach and ternarization for effective minutiae extraction." International Journal of Machine Learning and Computing 2, no. 4 (2012): 397.
[30]. Palanimuthu, Kogila, Eshetu Fikadu Hamba Yigazu, Gemechu Gelalcha, Yirgalem Bekele, Getachew Birhanu, and Birhanu Gutu. "Assessment of Stress, Fear, Anxiety and Depression on COVID-19 Outbreak among Adults in South-Western Ethiopia." Prof.(Dr) RK Sharma 21, no. 1 (2021): 440.
[31]. Melse, Roland W., and Arjan W. Van der Werf. "Biofiltration for mitigation of methane emission from animal husbandry." Environmental science & technology 39, no. 14 (2005): 5460-5468.
[32]. Krishna Kumar TP, M. Ramachandran, Chinnasami Sivaji, Chandrasakar Raja, " Financing practices of Micro and Small Entrepreneurs using WSM MCDM Method", REST Journal on Data Analytics and Artificial Intelligence, 1(4), (2022):18-25.
[33]. Kumar, Rakesh, Neha Grover, Rajesh Singh, Samta Kathuria, Anil Kumar, and Aditi Bansal. "Imperative Role of Artificial Intelligence and Big Data in Finance and Banking Sector." In 2023 International Conference on Sustainable Computing and Data Communication Systems (ICSCDS), pp. 523-527. IEEE, 2023.
[34]. Tembhurne, S., C. M. Goswami, and S. V. Deshmukh. "An Improvement In Cloud Data Security That Uses Data Mining." International Journal of Advanced Research in Computer Engineering & Technology 4 (2015): 2044-2049.
[35]. Yongqiang, C. H. E. N., L. I. Shaofang, Liu Hongmei, Tao Pin, and C. H. E. N. Yilin. "Application of intelligent technology in animal husbandry and aquaculture industry." In 2019 14th International Conference on Computer Science & Education (ICCSE), pp. 335-339. IEEE, 2019.
[36]. Mannar, B. Raja. "The financial crisis in Sweden: The causes, consequences and recovery." Saudi Journal of Business and Management Studies 2 (2017): 1031-1035.
[37]. Fulmare, Nilima Salankar, Prasun Chakrabarti, and Divakar Yadav. "Understanding and estimation of emotional expression using acoustic analysis of natural speech." International Journal on Natural Language Computing (IJNLC) 2, no. 4 (2013): 37-46.
[38]. Sun, Chia-Chi. "A performance evaluation model by integrating fuzzy AHP and fuzzy TOPSIS methods." Expert systems with applications 37, no. 12 (2010): 7745-7754.
[39]. Salih, Mahmood M., B. B. Zaidan, A. A. Zaidan, and Mohamed A. Ahmed. "Survey on fuzzy TOPSIS state-of-the-art between 2007 and 2017." Computers & Operations Research 104 (2019): 207-227.
[40]. Tasisa, Yirgalem Bekele, and Kogila Palanimuthu. "Psychosocial Impacts of Imprisonment among Youth Offenders in Correctional Administration Center, Kellem Wollega Zone, Ethiopia." Medico-legal Update 21, no. 2 (2021).
[41]. Yong, Deng. "Plant location selection based on fuzzy TOPSIS." The International Journal of Advanced Manufacturing Technology 28, no. 7 (2006): 839-844.
[42]. Gusain, Akshita, Tilottama Singh, Shweta Pandey, Vikrant Pachourui, Rajesh Singh, and Anil Kumar. "E-Recruitment using Artificial Intelligence as Preventive Measures." In 2023 International Conference on Sustainable Computing and Data Communication Systems (ICSCDS), pp. 516-522. IEEE, 2023.
[43]. Goswami, Chandrashekhar, and Parveen Sultana. "Adaptive Congestion control approach by using Cross-Layer technique in Mobile Ad-Hoc Network." Solid State Technology 63, no. 6 (2020): 5069-5091.
[44]. S Ramesh, M. Ramachandran, Vimala Saravanan, Prabakaran Nanjundan, "Evaluation of Employee performance management using VIKOR Method", REST Journal on Data Analytics and Artificial Intelligence, 1(4), (2022):10-17.
[45]. Bajaj, Karan, Bhisham Sharma, and Raman Singh. "Integration of WSN with IoT applications: a vision, architecture, and future challenges." Integration of WSN and IoT for Smart Cities (2020): 79-102.
[46]. Kamali, Ali-Mohammad, Milad Kazemiha, Behnam Keshtkarhesamabadi, Mohsan Daneshvari, Asadollah Zarifkar, Prasun Chakrabarti, Babak Kateb, and Mohammad Nami. "Simultaneous transcranial and transcutaneous spinal direct current stimulation to enhance athletic performance outcome in experienced boxers." Scientific Reports 11, no. 1 (2021): 19722.
[47]. B. Mago, A. Abdullahi Aideed, H. Salim Al Ali, S. Saeed Alnuaimi, and F. Rashid Al Qahtani, "Ethical Decision Making in Soft lifting-A UAE Based Case Study", IJGASR, vol. 1, no. 2, pp. 7–20, Jun. 2022.
[48]. Rathor, Ketan, Anshul Mandawat, Kartik A. Pandya, Bhanu Teja, Falak Khan, and Zoheib Tufail Khan. "Management of Shipment Content using Novel Practices of Supply Chain Management and Big Data Analytics." In 2022 International Conference on Augmented Intelligence and Sustainable Systems (ICAISS), pp. 884-887. IEEE, 2022.
[49]. Chu, T-C., and Y-C. Lin. "A fuzzy TOPSIS method for robot selection." The International Journal of Advanced Manufacturing Technology 21, no. 4 (2003): 284-290.
[50]. Gutu, Birhanu, Genene Legese, Nigussie Fikadu, Birhanu Kumela, Firafan Shuma, Wakgari Mosisa, Zelalem Regassa et al. "Assessment of preventive behavior and associated factors towards COVID-19 in Qellam Wallaga Zone, Oromia, Ethiopia: A community-based cross-sectional study." PloS one 16, no. 4 (2021): e0251062.
[51]. Kumar, Vivek, Kapil Joshi, Puneet Kanti, Jagdeep Singh Reshi, Gunjan Rawat, and Anil Kumar. "Brain Tumor Diagnosis using Image Fusion and Deep Learning." In 2023 International Conference on Sustainable Computing and Data Communication Systems (ICSCDS), pp. 1658-1662. IEEE, 2023.

[52]. Chu, T-C. "Selecting plant location via a fuzzy TOPSIS approach." The International Journal of Advanced Manufacturing Technology 20, no. 11 (2002): 859-864.
[53]. K. Janaki Priya, M Ramachandran, Kurinjimalar Ramu, Malarvizhi Mani, “Social Media Communication Using TOPSIS Method”, Social Media Communication Using TOPSIS Method, 1(3), (2022):27-35.
[54]. Sukumaran, C., M. Ramachandran, Vimala Saravanan, and Sathiyaraj Chinnasamy. "An Empirical Study of Brand Marketing Using TOPSIS MCDM Method." REST Journal on Banking, Accounting and Business 1, no. 1 (2022): 10-18.
[55]. Ramu, Gandikota, P. Dileep Kumar Reddy, and Appawala Jayanthi. "A survey of precision medicine strategy using cognitive computing." International Journal of Machine Learning and Computing 8, no. 6 (2018): 530-535.
[56]. Palczewski, Krzysztof, and Wojciech Sałabun. "The fuzzy TOPSIS applications in the last decade." Procedia Computer Science 159 (2019): 2294-2303.
[57]. Sinha, Ashish Kumar, Ananda Shankar Hati, Mohamed Benbouzid, and Prasun Chakrabarti. "ANN-based pattern recognition for induction motor broken rotor bar monitoring under supply frequency regulation." Machines 9, no. 5 (2021): 87.
[58]. D. Kaushik, “Role and Application of Artificial Intelligence in Business Analytics: A Critical Evaluation”, IJGASR, vol. 1, no. 3, pp. 01–11, Oct. 2022.
[59]. Goswami, Chandrashekhar, Ramakrishnan Raman, Biju G. Pillai, Rajesh Singh, Basava Dhanne, and Dhiraj Kapila. "Implementation of a Machine Learning-based Trust Management System in Social Internet of Things." In 2022 5th International Conference on Contemporary Computing and Informatics (IC3I), pp. 1586-1590. IEEE, 2022.
[60]. Mannar, B. Raja. "Medium, Small and Micro Enterprises: The Indian Perspective." Journal of Alternative Perspectives in the Social Sciences 9, no. 4 (2019): 710-728.
[61]. Kumar, Mukesh, Karan Bajaj, Bhisham Sharma, and Sushil Narang. "A Comparative Performance Assessment of Optimized Multilevel Ensemble Learning Model with Existing Classifier Models." Big Data 10, no. 5 (2022): 371-387.
[62]. Kumar, Ashish, Ketan Rathor, Snehit Vaddi, Devanshi Patel, Preethi Vanjarapu, and Manichandra Maddi. "ECG Based Early Heart Attack Prediction Using Neural Networks." In 2022 3rd International Conference on Electronics and Sustainable Communication Systems (ICESC), pp. 1080-1083. IEEE, 2022.
[63]. N. Valecha, “A Study on Importance of Ethical Responsibilities in HR Management”, IJGASR, vol. 1, no. 1, pp. 13–22, Feb. 2022.
[64]. D. Ravindran, M Ramachandran, Chinnasami Sivaji, Manjula Selvam, “Consumer Attitude towards ‘Online Food Ordering ‘: An Empirical Study”, REST Journal on Data Analytics and Artificial Intelligence, 1(3), (2022):19-26.
[65]. Sukumaran, C., B. Karpagavalli, R. Hariharan, and V. Parthiban. "Preclusive Strategies of Obesity to Lead a Healthy Life-A Review‖." Pharmaceutical Sciences and Research 1, no. 1 (2022): 42-45.
[66]. Kutlu, Ahmet Can, and Mehmet Ekmekçioğlu. "Fuzzy failure modes and effects analysis by using fuzzy TOPSIS-based fuzzy AHP." Expert systems with applications 39, no. 1 (2012): 61-67.
[67]. Wang, Tien-Chin, and Hsien-Da Lee. "Developing a fuzzy TOPSIS approach based on subjective weights and objective weights." Expert systems with applications 36, no. 5 (2009): 8980-8985.
[68]. Kumar, Rakesh, Samta Kathuria, Rupa Khanna Malholtra, Anil Kumar, Anita Gehlot, and Kapil Joshi. "Role of Cloud Computing in Goods and Services Tax (GST) and Future Application." In 2023 International Conference on Sustainable Computing and Data Communication Systems (ICSCDS), pp. 1443-1447. IEEE, 2023.
[69]. Chen, Ting-Yu, and Chueh-Yung Tsao. "The interval-valued fuzzy TOPSIS method and experimental analysis." Fuzzy sets and systems 159, no. 11 (2008): 1410-1428.
[70]. Reddy, Ummadi Janardhan, Pandluri Dhanalakshmi, and Pallela Dileep Kumar Reddy. "Image Segmentation Technique Using SVM Classifier for Detection of Medical Disorders." Ingénierie Des Systèmes D'information 24, no. 2 (2019).
[71]. Rathor, Ketan, Keyur Patil, Mandiga Sahasra Sai Tarun, Shashwat Nikam, Devanshi Patel, and Sasanapuri Ranjit. "A Novel and Efficient Method to Detect the Face Coverings to Ensurethe Safety using Comparison Analysis." In 2022 International Conference on Edge Computing and Applications (ICECAA), pp. 1664-1667. IEEE, 2022.
[72]. Sukumaran, C., D. Selvam, M. Sankar, V. Parthiban, and C. Sugumar. "Application of Artificial Intelligence and Machine Learning to Predict Basketball Match Outcomes: A Systematic Review." Computer Integrated Manufacturing Systems 28, no. 11 (2022): 998-1009.
[73]. Goswami, Chandrashekhar, Anupam Das, Karrar Imran Ogaili, Vivek Kumar Verma, Vijay Singh, and Dilip Kumar Sharma. "Device to Device Communication in 5G Network using Device-Centric Resource Allocation Algorithm." In 2022 4th International Conference on Inventive Research in Computing Applications (ICIRCA), pp. 467-472. IEEE, 2022.
[74]. Jain T, Jha R, Tiwari A, et al. (November 24, 2022) A Comparative Study to Evaluate the Anesthetic Efficacy of Buffered Versus Non-buffered 2% Lidocaine During Inferior Alveolar Nerve Block. Cureus 14(11): e31855. doi:10.7759/cureus.31855
[75]. Mannar, B. R. "Performance evaluation of some select equity funds floated by private sector banks." International Journal of Research in Commerce & Management 3, no. 10 (2012): 113-117.

[76]. Jayalakshmi VA, M. Ramachandran, Vimala Saravanan, Ashwini Murugan, "A Review on Forecasting Exchange Rate and Volatile Using SPSS Analysis", REST Journal on Data Analytics and Artificial Intelligence, 1(3), (2022):9-18.
[77]. Zamri, Nurnadiah, Lazim Abdullah, Muhammad Suzuri Hitam, Noor Maizura Mohammad Noor, and Ahmad Jusoh. "A novel hybrid fuzzy weighted average for MCDM with interval triangular type-2 fuzzy sets." WSEAS Transactions on Systems 12, no. 4 (2013): 212-228.
[78]. Dogra, Roopali, Shalli Rani, and Bhisham Sharma. "A review to forest fires and its detection techniques using wireless sensor network." In Advances in Communication and Computational Technology: Select Proceedings of ICACCT 2019, pp. 1339-1350. Springer Singapore, 2021.
[79]. Sukumaran, C., and P. J. Sebastian. "Effect of Inclusive Games and Physical Exercises on Selected Physical Variables among the Intellectually Challenged Children." Annals of the Romanian Society for Cell Biology 26, no. 01 (2022): 1442-1450.
[80]. Ervural, Beyzanur Cayir, Selim Zaim, Omer F. Demirel, Zeynep Aydin, and Dursun Delen. "An ANP and fuzzy TOPSIS-based SWOT analysis for Turkey's energy planning." Renewable and Sustainable Energy Reviews 82 (2018): 1538-1550.
[81]. R. Rathore, "A Study on Application of Stochastic Queuing Models for Control of Congestion and Crowding", IJGASR, vol. 1, no. 1, pp. 1–6, Feb. 2022.
[82]. Kumar, Singamaneni Kranthi, Pallela Dileep Kumar Reddy, Gajula Ramesh, and Venkata Rao Maddumala. "Image transformation technique using steganography methods using LWT technique." Traitement du Signal 36, no. 3 (2019): 233-237.
[83]. Ashtiani, Behzad, Farzad Haghighirad, Ahmad Makui, and Golam ali Montazer. "Extension of fuzzy TOPSIS method based on interval-valued fuzzy sets." Applied Soft Computing 9, no. 2 (2009): 457-461.
[84]. Bottani, Eleonora, and Antonio Rizzi. "A fuzzy TOPSIS methodology to support outsourcing of logistics services." Supply Chain Management: An International Journal (2006).
[85]. Jasvinder Kaur, M. Ramachandran, Sathiyaraj Chinnasamy, Prabakaran Nanjundan, "Building Logistics Capabilities through Third-party Logistics Relationships Using COPRAS Method", REST Journal on Data Analytics and Artificial Intelligence, 1(3), (2022):1-8.
[86]. Rathor, Ketan, Sushant Lenka, Kartik A. Pandya, B. S. Gokulakrishna, Susheel Sriram Ananthan, and Zoheib Tufail Khan. "A Detailed View on industrial Safety and Health Analytics using Machine Learning Hybrid Ensemble Techniques." In 2022 International Conference on Edge Computing and Applications (ICECAA), pp. 1166-1169. IEEE, 2022.
[87]. Mannar, Raja B., and Rama Chandra B. Reddy. "Analysis of Insight of Investors towards Mutual Funds." Radix International Journal of Banking. Finance and Accounting (RIJBFA) 2, no. 2 (2013): 1-15.
[88]. Sukumaran, C., M. Ramachandran, Chinnasami Sivaji, and Manjula Selvam. "Ranking of Product in E-store using WASPAS method." REST Journal on Banking, Accounting and Business 1, no. 1 (2022): 1-9.
[89]. Sharma, Bhisham, and Deepika Koundal. "Cattle health monitoring system using wireless sensor network: a survey from innovation perspective." IET Wireless Sensor Systems 8, no. 4 (2018): 143-151.
[90]. Sun, Chia-Chi, and Grace TR Lin. "Using fuzzy TOPSIS method for evaluating the competitive advantages of shopping websites." Expert Systems with Applications 36, no. 9 (2009): 11764-11771.