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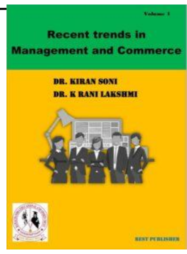

Evaluation of Agricultural Waste Using Weighted Aggregated Sum Product Assessment (WASPAS) Method

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Abstract. Largely produced in India's Agricultural waste, biogas is the raw material of the future for production. Based on agricultural waste and biogas Agricultural waste management for the circular economy, Biogas production and utilization and policy support need coordination. From agricultural wastes Biogas production potential, Along with government initiatives, policy regulations upgrading and utilization this article discusses it in detail. Additionally, 35 are efficient for a biogas-based circular economy Barriers to preventing the generation of agricultural waste and Agricultural Waste management, energy production and climate change mitigation to meet the growing needs Future research opportunities are also discussed. The Objective of this thesis finding the best cleaning location for Agricultural waste or (WASPAS) method shows. The time and attendance software selection problem of a private hospital, Inter Criteria Correlation (CRITIC) and Based on Weighted Aggregate Product Assessment (WASPAS) methods a new integrated decision-making approach is used. Weights of criteria are determined by the CRITIC method and alternatives to find the most suitable alternative Sorted by WASPAS method. Combining CRITIC and WASPAS methods for the first time the novelty of this article is in the literature. The Weighted Aggregate Product Assessment (WASPAS) method, Used to assess the adverse effects of project risks. Compared to alternative ranking independent methods this method is efficient and highly accurate. WASPAS method One of the newer multi-indicator decision-making techniques, It is accepted and used in many areas. Ultimate analysis C, Ultimate analysis H, Ultimate analysis O, Ultimate analysis N, Ultimate analysis S there are alternatives parameter and Chicken litter (dried), Swine solids (dried), Feedlot manure (dried), Beef feedlot manure (dried) there are evaluation parameters. S has the top rank in Ultimate Analysis, while O has the lowest rank in Ultimate Analysis.
Keywords: Agricultural wastes, CRITIC, WSM, WPM.

Introduction

Agricultural wastes, by-products and By-products are generally not food or feed defined as a (or further unprocessed) plant or animal remains, they are additional environmental and in agriculture and primary processing sectors can also lead to financial burdens. Promoting a circular economy approach is considered crucial. Agricultural wastes, mainly fertilizers, energy, materials and molecules Use radical conversion processes that can yield sustainable biological products Primary residues are those that can be converted into resources. Converting this agricultural residue to economic development and Separating human well-being from the use of (primary) resources, To prevent pressure on the ground, and to have adverse effects on biodiversity is also important to pose a risk to global food security. The Weighted Aggregate Product Assessment (WASPAS) method, Compared to the one proposed by Zavadskas et al A new MADM method. The WASPAS method is highly practical and draws heavily on the concept of ranking accuracy. They analyzed and discussed the WASPAS approach, finally, this approach is better than WSM and WPM they concluded that it was powerful. They also indicated which WASPAS method had the highest accuracy among other methods. In recent years, some studies indicated the potential of the WASPAS method in several fields. In this regard, Bagosius et al. For economic needs in Europe Based on WASPAS and entropy methods for selecting deep water port proposed an integrated method. Durkin et al. (2015) for site selection for shopping centre construction. Based on Fuzzy WASPAS and Fuzzy AHP suggested a hybrid model. Proposed for specific complex problems they concluded that a hybrid model is appropriate.

Materials and Methods

Agricultural Waste: Abundant in an agriculturally based country like Malaysia Concrete using agricultural waste, for conventional lightweight concrete offers an interesting alternative. Aggregate or aggregate agricultural waste in concrete Use as cement substitute it is engineering capability and has an economic advantage. All kinds of agricultural wastes Ideal for use in concrete have physical and chemical properties. In low-cost lightweight structures, Solid agricultural waste with cement matrix specifications is Able to meet rough aggregate design. Agricultural waste can also be used in non-load bearing concrete; there compressive strength is not important. Particle boards, roofing sheets and to make partition panels Agricultural 9bres can be used in concrete. Have been studied as cement substitutes. Previous studies, Uses agricultural waste in concrete three broad categories can be distinguished. Anaerobic digesters convert organic waste into energy (biogas). In addition, the tick estate produced a good soil additive and increase crop production can be used by farmers. Advantages of Anaerobic Digestion These include energy production (biogas), material recovery (fertilizers) and waste disposal. Biogas productions, to overcome energy problems improve the agricultural sector, increase efficiency and it can also act as a service that takes into account environmental compliance. Utilization of agricultural wastes Very important. From aqueous solutions at various operating conditions for removing various dyes many agricultural waste products are studied. Interdisciplinary communication (CRITIC) and By Weighted Aggregate Product Assessment (WASPAS) Criterion importance is the use of time and Access including software selection issues. The CRITIC method determines the weights are an objective method; in which the intensity of variation and the framing of the decision problem include: It is the method of communication and Belongs to the class of criteria against which alternatives are evaluated the decision matrix is based on analytical testing to determine the information. On the other hand, WASPAS is a Weighted Sum Model (WSM) and a systematic combination of the Weighted Product Model (WPM) and it is used. To rank alternatives thoroughly. Based on a combination of Critic and WASPAS methods to demonstrate the applicability of a new decision-making approach. Insect 2, a new decision-making approach is introduced. The WASPAS method is still being developed, Thus to solve various decision-making problems this approach can be used. An extension of the WASPAS method using fuzzy sets can be found in Turskis et al. In turn, Zavadskas, Turskis, and Antucheviciene (2015) proposed grey values to handle misinformation. (WASPAS-G) used the WASPAS approach. According to the authors, in this case, the combination of these two methods is to maintain the ranking of the development strategy and provide an opportunity, to choose the most effective investment or management decisions. Proposed to integrate true inter-scale correlations (CRITIC) of criterion importance with Wasspass methods. Determining objective weights using CRITIC the authors demonstrate that it increases the accuracy of the evaluation of alternative solutions in the decision-making process. To improve imprecise treatment in the field of multi-criteria group decision-making proceeded to resolve the issue. For this purpose, they based the approximate numbers of the WASPAS approach.

Results and Discussion

TABLE 1. Agricultural wastes

	Chicken litter (dried)	Swine solids (dried)	Feedlot manure (dried)	Beef feedlot manure (dried)
Ultimate analysis C	45.32	47.3	45.39	46.43
Ultimate analysis H	42.65	41.54	33.69	27.3
Ultimate analysis O	24.08	27.87	34.78	49
Ultimate analysis N	23.17	34.76	35.86	28.65
Ultimate analysis S	33.33	54.76	27.96	39.09

Table 1 shows the Agricultural wastes Analysis using the WASPAS Method. Ultimate analysis C, Ultimate analysis H, Ultimate analysis O, Ultimate analysis N, Ultimate analysis S there are alternative parameters and Chicken litter (dried), Swine solids (dried), manure (dried), Beef feedlot manure (dried) there are Evaluation Parameter.

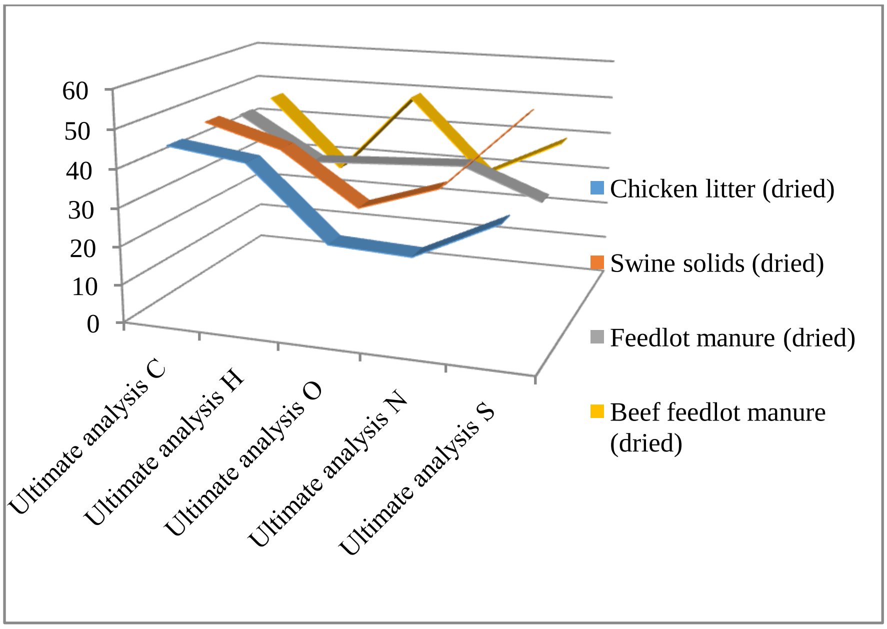

FIGURE 1. Agricultural wastes

Figure 1. Shows the Agricultural wastes using the Analysis method in WASPAS. Alternative Parameters are Ultimate analysis C, Ultimate analysis H, Ultimate analysis O, Ultimate analysis N, Ultimate analysis S and Evaluation parameter are Chicken litter (dried), Swine solids (dried), manure (dried), Beef feedlot manure (dried).

TABLE 2. Performance Value

	Performance value			
Ultimate analysis C	1.00000	0.86377	0.61599	0.58798
Ultimate analysis H	0.94109	0.75858	0.82992	1.00000
Ultimate analysis O	0.53133	0.50895	0.80391	0.55714
Ultimate analysis N	0.51125	0.63477	0.77970	0.95288
Ultimate analysis S	0.73544	1.00000	1.00000	0.69839

Table 2 shows the performance value of the Agricultural wastes using the WASPAS method it is calculated by the value in the dataset is divided by the maximum of the given value of the data set.

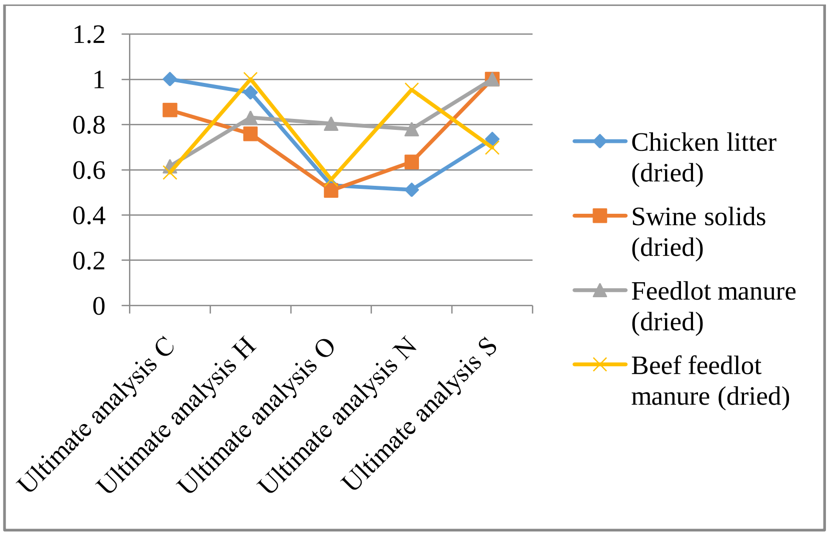

FIGURE 2. Performance Value

Figure 2. Shows the performance Value Agricultural wastes in Ultimate analysis C, Ultimate analysis H, Ultimate analysis O, Ultimate analysis N, Ultimate analysis S, Chicken litter (dried), Swine solids (dried), manure (dried), Beef feedlot manure (dried).

TABLE 3. Weigh

	Weight			
Ultimate analysis C	0.25	0.25	0.25	0.25
Ultimate analysis H	0.25	0.25	0.25	0.25
Ultimate analysis O	0.25	0.25	0.25	0.25
Ultimate analysis N	0.25	0.25	0.25	0.25
Ultimate analysis S	0.25	0.25	0.25	0.25

Table 3 shows Weight ages used for the analysis. We taken same weights for all the parameters for the analysis

TABLE 4. Weighted normalized decision matrix in WSM and WPM Weighted Product Model

	Weighted normalized decision matrix							
	WSM Weighted Sum Model				WPM Weighted Product Model			
Ultimate analysis C	0.25000	0.21594	0.15400	0.14700	1.00000	0.96405	0.88592	0.87567
Ultimate analysis H	0.23527	0.18965	0.20748	0.25000	0.98493	0.93326	0.95446	1.00000
Ultimate analysis O	0.13283	0.12724	0.20098	0.13929	0.85377	0.84463	0.94690	0.86396
Ultimate analysis N	0.12781	0.15869	0.19492	0.23822	0.84559	0.89259	0.93968	0.98801
Ultimate analysis S	0.18386	0.25000	0.25000	0.17460	0.92605	1.00000	1.00000	0.91416

Table 4 shows the weighted normalization decision matrix WSM and WPM it is calculated by multiplying the weight and performance value in table 2 and table 3 Ultimate analysis C, Ultimate analysis H, Ultimate analysis O, Ultimate analysis N, Ultimate analysis S, Chicken litter (dried), Swine solids (dried), manure (dried), Beef feedlot manure (dried).

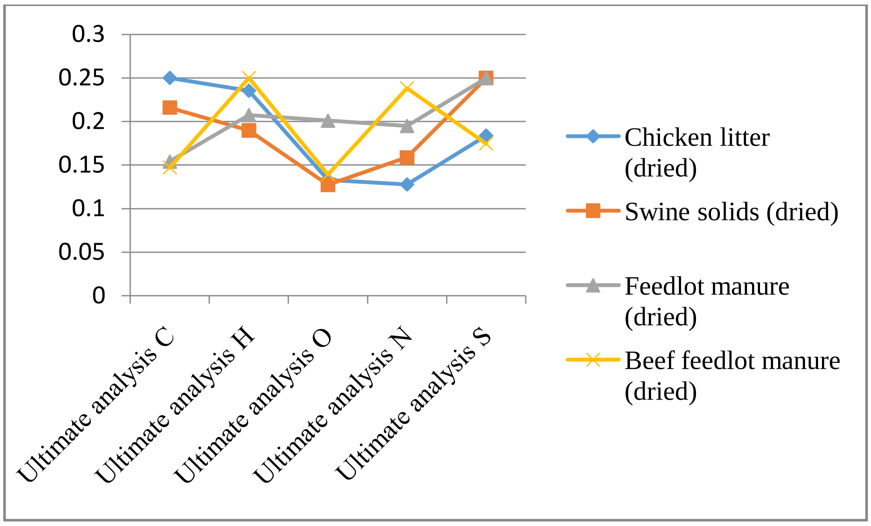

FIGURE 3. Weighted normalized decision matrix WSM

Figure 3 shows the weighted normalization decision matrix using WSM it is calculated by multiplying the weight and performance value in table 2 and table 3 Ultimate analysis C, Ultimate analysis H, Ultimate analysis O, Ultimate analysis N, Ultimate analysis S, Chicken litter (dried), Swine solids (dried), manure (dried), Beef feedlot manure (dried).

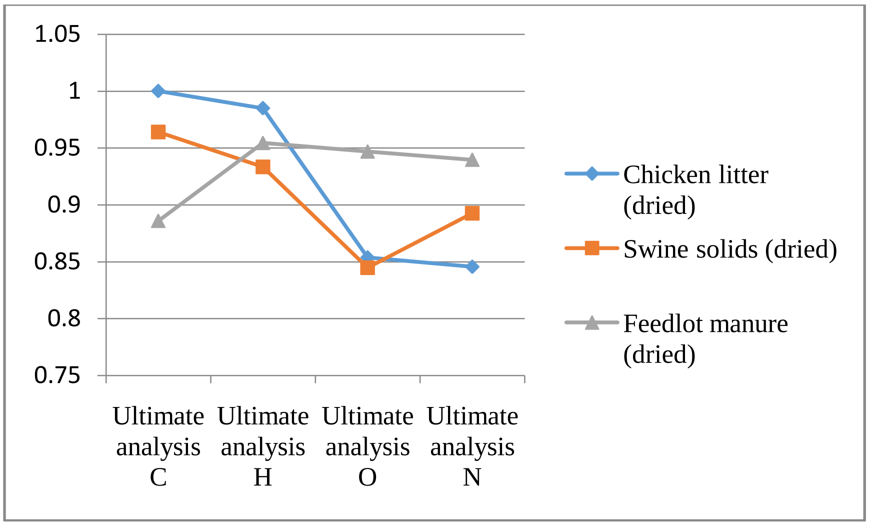

FIGURE 4. Weighted normalized decision matrix WPM

Figure 3 shows the weighted normalization decision matrix using WPM it is calculated by multiplying the weight and performance value in table 2 and table 3 Ultimate analysis C, Ultimate analysis H, Ultimate analysis O, Ultimate analysis N, Ultimate analysis S, Chicken litter (dried), Swine solids (dried), manure (dried), Beef feedlot manure (dried).

TABLE 5. Preference Score

	Preference Score	
	WSM	WPM
Ultimate analysis C	0.76694	0.74788
Ultimate analysis H	0.88240	0.87734
Ultimate analysis O	0.60033	0.58993
Ultimate analysis N	0.71965	0.70074
Ultimate analysis S	0.85846	0.84657

Table 5 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.

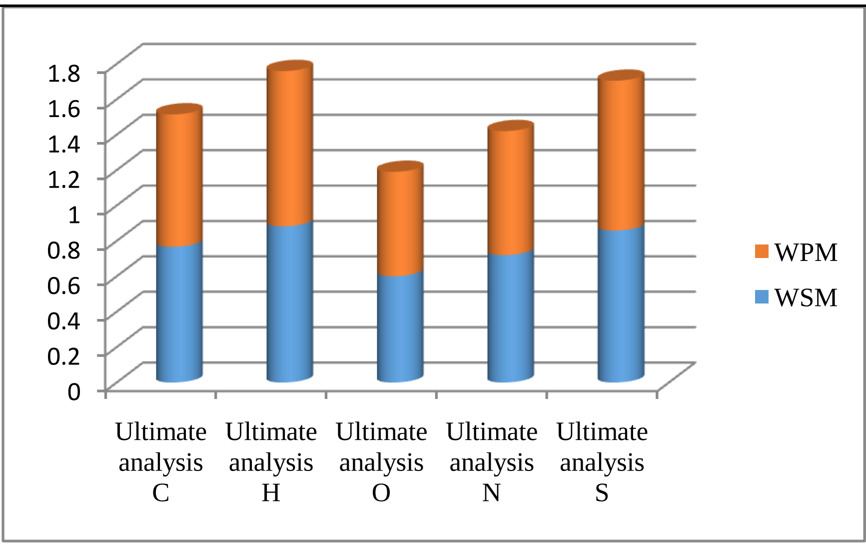

FIGURE 5. Preference Score for WSM and WPM

Figure 5 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 6. WASPAS coefficient and Rank

	WASPAS Coefficient	Rank
Ultimate analysis C	0.75741	3
Ultimate analysis H	0.87987	1
Ultimate analysis O	0.59513	5
Ultimate analysis N	0.71019	4
Ultimate analysis S	0.85251	2

Table 7 shows the WASPAS Coefficient and Final Result of Manufacturing Companies using the analysis Method in WASPAS. Ultimate analysis H is got the first rank whereas is the Ultimate analysis O is having the lowest rank.

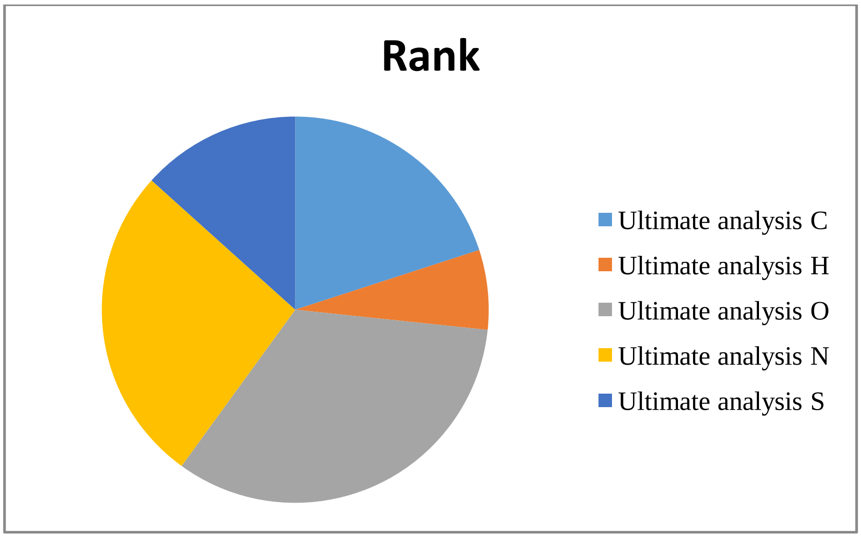

FIGURE 6. Rank

Figure 6. Shows the Agricultural wastes final result is Ultimateanalysis H is got the first rank whereas is the Ultimate analysis O is having the lowest rank

Conclusion

Combined with the overwhelmingly positive results of using orange waste in forest restoration these enhanced concerns, despite careful consideration of social, political and unique environmental conditions, as a management tool for forest restoration Agricultural wastes may have considerable potential, they say. Discharge of chemical or biohazard into local waterways) is warranted. Especially the potential harm caused by pesticides or other problematic compounds which deserve careful consideration and protection. Assuming that these conditions can be met, further studies on the use of agricultural wastes for remediation should be encouraged as is already the case in Costa Rica Current or ecosystem service projects are subsidized through future payments. Named FF-WASPAS a collective MCDM method is established by combining environmental entropy measurement. In the proposed framework, to estimate scale weight for the HCWDL selection score function and Based on the entropy measure a procedure was used. For this, a novel scoring function in the context of FFSs and Entropy measurement is introduced. Next, the proposed framework was applied to In Uttarakhand, India Empirical Study of the HCWDL Examination. This is the FF-WASPAS approach that Demonstrates effectiveness and practicality. It is proposed of the WASPAS system Also determines compatibility. Finally, the existing and the proposed VIKOR methods A comparative study Checking the consistency. The proposed approach the main advantages are ease of calculation in the IVIF environment and obtaining Criteria and decision-makers a procedure is to use. The Final Result is Ultimate analysis H got the first rank whereas the Ultimate analysis O is having the lowest rank.

References

1. Mancera, Camilo, Nour-Eddine El Mansouri, María Angels Pelach, FerrandoFrancesc, and Joan Salvadó. "Feasibility of incorporating treated lignins in fiberboards made from agricultural waste." Waste Management 32, no. 10 (2012): 1962-1967.
2. Karellas, Sotirios, IoannisBoukis, and Georgios Kontopoulos. "Development of an investment decision tool for biogas production from agricultural waste." Renewable and Sustainable Energy Reviews 14, no. 4 (2010): 1273-1282.
3. Ning, Chao, and Fengqi You. "Data-driven Wasserstein distributionally robust optimization for biomass with agricultural waste-to-energy network design under uncertainty." Applied Energy 255 (2019): 113857.
4. Mannan, M. A., and C. Ganapathy. "Concrete from an agricultural waste-oil palm shell (OPS)." Building and environment 39, no. 4 (2004): 441-448.
5. Sarkar, Nibedita, Sumanta Kumar Ghosh, SatarupaBannerjee, and KaustavAikat. "Bioethanol production from agricultural wastes: an overview." Renewable energy 37, no. 1 (2012): 19-27.
6. Vaibhav, Vineet, U. Vijayalakshmi, and S. MohanaRoopan. "Agricultural waste as a source for the production of silica nanoparticles." Spectrochimicaacta part A: Molecular and biomolecular spectroscopy 139 (2015): 515-520.
7. Kapoor, Rimika, Pooja Ghosh, Madan Kumar, SubhanjanSengupta, Asmita Gupta, Smita S. Kumar, Vandit Vijay, Vivek Kumar, Virendra Kumar Vijay, and Deepak Pant. "Valorization of agricultural waste for biogas based circular economy in India: A research outlook." Bioresource Technology 304 (2020): 123036.
8. Gregorich, E. G., M. R. Carter, D. A. Angers, CMáMonreal, and B. H. Ellert. "Towards a minimum data set to assess soil organic matter quality in agricultural soils." Canadian journal of soil science 74, no. 4 (1994): 367-385.
9. Achinas, Spyridon, and Gerrit Jan Willem Euverink. "Theoretical analysis of biogas potential prediction from agricultural waste." Resource-Efficient Technologies 2, no. 3 (2016): 143-147.
10. Hesas, RoozbehHoseinzadeh, Wan MohdAshri Wan Daud, J. N. Sahu, and ArashArami-Niya. "The effects of a microwave heating method on the production of activated carbon from agricultural waste: A review." Journal of Analytical and Applied pyrolysis 100 (2013): 1-11.
11. Garg, Umesh K., M. P. Kaur, V. K. Garg, and DhirajSud. "Removal of hexavalent chromium from aqueous solution by agricultural waste biomass." Journal of Hazardous materials 140, no. 1-2 (2007): 60-68.
12. Bharathi, K. S., and S. T. Ramesh. "Removal of dyes using agricultural waste as low-cost adsorbents: a review." Applied Water Science 3, no. 4 (2013): 773-790.
13. Lashgari, Shima, JurgitaAntuchevičienė, AlirezaDelavari, and Omid Kheirkhah. "Using QSPM and WASPAS methods for determining outsourcing strategies." Journal of Business Economics and Management 15, no. 4 (2014): 729-743.
14. Tuş, Ayşegül, and EsraAytaçAdalı. "The new combination with CRITIC and WASPAS methods for the time and attendance software selection problem." Opsearch 56, no. 2 (2019): 528-538.
15. KazimierasZavadskas, Edmundas, RomualdasBaušys, and Marius Lazauskas. "Sustainable assessment of alternative sites for the construction of a waste incineration plant by applying WASPAS method with single-valued neutrosophic set." Sustainability 7, no. 12 (2015): 15923-15936.
16. Baykasoğlu, Adil, and İlkerGölcük. "Revisiting ranking accuracy within WASPAS method." Kybernetes (2019).

17. Ilbahar, Esra, and CengizKahraman. "Retail store performance measurement using a novel interval-valued Pythagorean fuzzy WASPAS method." Journal of Intelligent & Fuzzy Systems 35, no. 3 (2018): 3835-3846.
18. GhorshiNezhad, Mohammad Reza, SarfarazHashemkhaniZolfani, FathollahMoztarzadeh, EdmundasKazimierasZavadskas, and Mohsen Bahrami. "Planning the priority of high tech industries based on SWARA-WASPAS methodology: The case of the nanotechnology industry in Iran." Economic research-Ekonomskaistraživanja 28, no. 1 (2015): 1111-1137.
19. Ghorabaee, Mehdi Keshavarz, EdmundasKazimierasZavadskas, MaghsoudAmiri, and Ahmad Esmaeili. "Multi-criteria evaluation of green suppliers using an extended WASPAS method with interval type-2 fuzzy sets." Journal of Cleaner Production 137 (2016): 213-229.
20. Koller, Martin, Rodolfo Bona, Gerhart Braunegg, Carmen Hermann, PredragHorvat, Markus Kroutil, Julia Martinz, Jose Neto, Luis Pereira, and Paula Varila. "Production of polyhydroxyalkanoates from agricultural waste and surplus materials." Biomacromolecules 6, no. 2 (2005): 561-565.

