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SELECTION OF ZAKAH APPLICANTS BY USING FUZZY TECHNIQUE OF ORDER PREFERENCE FOR SIMILARITY TO IDEAL SOLUTION (TOPSIS) METHOD

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ABSTRACT – The Unit Zakat, Sedekah, and Wakaf (ZAWAF) Perlis in Malaysia provided zakah assistance to students. However, due to the limited funds and the large number of applications, not all applicants can receive assistance. To ensure fairness and eliminate ambiguity, this study aimed to select the entitled applicants among 383 applicants from various backgrounds at UiTM Perlis. Fuzzy Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method was employed for decision-making. Four criteria were considered for ranking the applicants: family income, number of dependents, number of disability or sick dependents, and amount of loan scholarship received per semester. The study identified the three most entitled applicants to receive zakah: S157, S190, and S222, with a closeness coefficient of 0.8569. Conversely, S262 was the least entitled applicant, with a closeness coefficient of 0.0360. The findings of this study have significant implications for various stakeholders, including ZAWAF Perlis, the entitled applicants, and zakah institutions in Malaysia. ZAWAF Perlis can use these findings to allocate zakah funds more effectively. The entitled students can use financial assistance to support their education and well-being. Moreover, other zakah institutions in Malaysia can adopt the TOPSIS method to improve selection processes and allocate funds more efficiently.

Keywords: Applicants, criteria, decision-making, ranking, TOPSIS

1. INTRODUCTION

The Fuzzy Technique of Order Preference for Similarity to Ideal Solution (TOPSIS) method is used to solve multi-criteria decision-making problems when there is uncertainty. During the selection process of zakah applicants, ZAWAF Perlis relied on manual selection methods. However, it is important to note that this approach may introduce elements of unfairness and ambiguity. Additionally, limited funds and a high number of applications further complicated the selection process for ZAWAF Perlis. In this study, the Fuzzy TOPSIS method was applied to prioritize and rank four criteria, allowing for the identification of the most entitled zakah applicants among students at UiTM Perlis.

This study demonstrates the effectiveness of the fuzzy TOPSIS in ranking zakah applicants, contradicting a previous study by Iswara et al. (2018) that used fuzzy AHP. However, both studies considered the same two criteria namely number of dependents and family income, in selecting zakah applicants.

2. METHODOLOGY

This study introduced the utilization of the Fuzzy TOPSIS method for the selection of zakah applicants. To apply this method effectively, two decision-makers were chosen from the group of interviewers involved in the selection process. They were responsible for evaluating the significance of each criterion and sub-criterion used in the evaluation. Furthermore, the data collected from ZAWAF Perlis was employed to gather information about the zakah applicants. Microsoft Excel was utilized to analyze the collected data from ZAWAF, which facilitates the selection process of zakah applicants.

3. RESULTS AND DISCUSSION

After considering the evaluations of the decision-makers regarding the significance of each criterion and sub-criterion, it was determined that the first crucial criterion is family income, followed by the number of disability or sick dependents, the amount of loan scholarships received per semester, and the number of dependents, respectively. On the other hand, the ranking of applicants is obtained based on the relative closeness coefficient value. The applicants' rankings were arranged in descending order, with S157, S190, and S222 achieving the highest relative closeness

coefficient value of 0.8569. This indicates that these three applicants should be given priority in receiving zakah assistance. Conversely, S262 is the least likely candidate to receive zakah, as this applicant obtained the lowest relative closeness coefficient value of 0.0360.

4. NOVELTY OF RESEARCH

Zakah serves as a significant income source and has the potential to serve as a means of financing targeted initiatives that enhance the social, political, and economic conditions within Muslim communities. Various organizations have been established to efficiently manage these funds and provide assistance to those in need. ZAWAF Perlis, established with the objective of supporting financially struggling UiTM students, is one such organization. To ensure that deserving individuals receive zakah, it is crucial to implement a selection process that gives priority to entitled applicants. Consequently, the purpose of this study was to employ the Fuzzy Technique of Order Preference for Similarity to Ideal Solution (TOPSIS) to select zakah applicants by ranking both the applicants and the evaluation criteria used to assess them.

5. CONCLUSION

The research conducted in this study demonstrates the utilization of the Fuzzy TOPSIS method for selecting zakah applicants. The data collected from ZAWAF Perlis was employed to assess and prioritize student applicants. The application of the fuzzy TOPSIS method successfully ensured a fair and unambiguous selection process for zakah recipients. The study effectively achieved its objectives of ranking the four evaluation criteria utilized by ZAWAF Perlis and ranking the 393 applicants. For future research, it is recommended to explore the use of Fuzzy Logic, particularly in constructing a Fuzzy Rule-Based System for selecting zakah applicants, as this method can handle the ranking of numerous alternatives. Furthermore, this study can be utilized to compare the proposed method with other Multiple Criteria Decision Analysis (MCDA) methods such as Analytic Hierarchy Process (AHP), as well as outranking methods like ELECTRE III and PROMETHEE II, in subsequent research endeavors.

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