

MODEL FOR DETERMINING CANDIDATES FOR VILLAGE SOCIAL ASSISTANCE USING THE AHP-MOORA METHOD

Hardian Oktavianto^{1*}; Dodik Aris Setiawan²; Guruh Wijaya³; Zainul Arifin⁴; Henny Wahyu Sulisty⁵

Informatics Engineering^{1,3,4,5}

Industrial Engineering²

Universitas Muhammadiyah Jember, Jember, Indonesia^{1,2,3,4,5}

<https://unmuhjember.ac.id/>^{1,2,3,4,5}

hardian@unmuhjember.ac.id^{1*}, dodikaris@unmuhjember.ac.id², guruh.wijaya@unmuhjember.ac.id³,
zainul.arifin@unmuhjember.ac.id⁴, henny.sulisty@unmuhjember.ac.id⁵

(*) Corresponding Author



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Abstract— Social assistance programs at the village level are one of the government's efforts to reduce poverty and improve community welfare. However, in practice, the process of determining eligible beneficiaries is often carried out manually, which may lead to subjectivity, inaccurate targeting, and a lack of transparency in decision-making. This study aims to develop a decision support system that assists village administrators in determining priority candidates for social assistance in a more objective and systematic manner. The proposed approach integrates the Analytical Hierarchy Process (AHP) and the Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) methods. The AHP method is used to determine the weight of each criterion through pairwise comparison matrices and consistency testing. Subsequently, the MOORA method is applied to normalize the decision matrix, calculate preference values, and rank the alternatives. The results show that AHP-MOORA can generate a priority ranking of potential social assistance beneficiaries. The calculated weights for the criteria respectively are Kepemilikan Tanah: 0.5579 (highest importance), Kondisi Rumah: 0.2633, Pekerjaan: 0.1219, Penghasilan: 0.0569 (lowest importance) and the value of CR is 0.0654, which is less than 0.1, indicating that the criteria weights are consistent. The ranking based on AHP-MOORA show significant differences than the earlier dataset. Based on sensitivity analysis, the high correlation values in all sensitivity tests show that the ranking results remain consistent. Furthermore, the system improves transparency and consistency in the decision-making process.

Keywords: AHP, Decision Making, Decision Support System, Moora, Village Social Assistance.

Intisari—Program bantuan sosial di tingkat desa merupakan salah satu upaya pemerintah untuk mengurangi kemiskinan dan meningkatkan kesejahteraan masyarakat. Namun, dalam praktiknya, proses penentuan penerima bantuan sering kali dilakukan secara manual, yang dapat menimbulkan subjektivitas, ketidaktepatan sasaran, serta kurangnya transparansi dalam pengambilan keputusan. Penelitian ini bertujuan untuk mengembangkan sistem pendukung keputusan yang membantu aparat desa dalam menentukan calon penerima bantuan sosial secara lebih objektif dan sistematis. Pendekatan yang diusulkan mengintegrasikan metode Analytical Hierarchy Process (AHP) dan Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA). Metode AHP digunakan untuk menentukan bobot setiap kriteria melalui matriks perbandingan berpasangan serta pengujian konsistensi. Selanjutnya, metode MOORA diterapkan untuk melakukan normalisasi matriks keputusan, menghitung nilai preferensi, dan melakukan perankingan alternatif. Kriteria yang digunakan dalam penelitian ini meliputi Kepemilikan Tanah, Kondisi Rumah, Pekerjaan, dan Penghasilan. Hasil penelitian menunjukkan bahwa metode AHP-MOORA mampu menghasilkan peringkat prioritas calon penerima bantuan sosial. Bobot kriteria yang diperoleh secara berturut-turut adalah Kepemilikan Tanah sebesar 0,5579 (paling penting), Kondisi Rumah sebesar 0,2633, Pekerjaan sebesar 0,1219, dan Penghasilan sebesar 0,0569 (paling rendah), dengan nilai Consistency Ratio (CR) sebesar 0,0654 yang lebih kecil dari 0,1, sehingga menunjukkan bahwa bobot kriteria konsisten. Hasil perankingan menggunakan AHP-MOORA juga menunjukkan perbedaan yang signifikan dibandingkan dengan data awal. Berdasarkan analisis sensitivitas, nilai korelasi yang tinggi pada seluruh pengujian

menunjukkan bahwa hasil peringkat tetap konsisten. Selain itu, sistem ini mampu meningkatkan transparansi dan konsistensi dalam proses pengambilan keputusan.

Kata Kunci: AHP, bantuan sosial desa, MOORA, pengambilan keputusan, sistem pendukung keputusan

INTRODUCTION

The distribution of social assistance at the village level plays a vital role in poverty alleviation and improving the welfare of underprivileged communities (Fang et al., 2025; Ruja et al., 2024; Q. Wang et al., 2024). This social assistance includes various types of assistance, ranging from food and health assistance to cash assistance aimed at alleviating the economic burden on the community (Grosh et al., 2022; Pertiwi et al., 2025). Despite its importance, the process of distributing this assistance is often hampered by systemic limitations and unclear criteria for selecting recipients (Germundsson & Stranz, 2024; Ruíz-Ortega et al., 2025). In many villages, the mechanism for selecting aid recipients still relies on subjective methods, such as deliberations involving village officials and community leaders (Lukman & Laluma, 2023). Subjective selection not only risks missing the target, but also creates injustice, opens up opportunities for personal interests, and reduces transparency in the process (Ginting et al., 2024; Merawati, 2024).

The government and various related institutions have recognized the importance of implementing a data-based system to determine who is entitled to receive social assistance (Fikri, 2023; Sania et al., 2024). Unfortunately, despite advances in information technology, many villages still do not utilize systems based on analytical modeling that can reduce subjective bias in decision-making (Panudju et al., 2023; Salsabila, 2023). In fact, the application of technologies such as Decision Support Systems (DSS) can be very helpful in providing more objective and transparent solutions (Adu et al., 2025; Elkady et al., 2024). One rapidly developing DSS method is Multi-Criteria Decision Making (MCDM), which allows for the assessment of various criteria relevant to social assistance (Alam Bhuiyan & Hammad, 2023; Keenan, 2024). In this context, two popular MCDM methods are the AHP and MOORA (Barman et al., 2024; Z. Wang et al., 2024).

The AHP method enables decision-making based on pairwise comparisons between existing criteria, thereby producing clear and consistent weights for each criterion (Dodevska et al., 2023). This process also involves subjective evaluation by

experts or stakeholders, but with a structured and transparent mechanism. Meanwhile, MOORA offers a more mathematical approach by utilizing ratio analysis to evaluate alternatives based on benefit and cost criteria (Kalan et al., 2024). These two methods can complement each other in the context of selecting social assistance recipients, where AHP helps determine the priority weight of criteria, while MOORA provides a ranking or order of priority for recipients based on predetermined criteria (Ginting et al., 2023).

The combination of the AHP and MOORA methods in the process of distributing village social assistance has the potential to reduce problems that often arise with manual methods, such as bias, inaccuracy, and lack of transparency. Although the application of these methods in other fields such as education, health, and risk management has been quite extensive, their application in the context of village social assistance is still limited (Anggraini et al., 2022; Barman et al., 2024). This study aims to develop and test a model for determining potential recipients of village social assistance using these two methods to create a more objective, accurate, and transparent system.

With the increasing need to improve the quality of public services in villages, this research is expected to make an important contribution to the development of data-based decision-making technology. In the future, the developed model can be used as a reference for village governments and other related parties in distributing social assistance in a more targeted and efficient manner. In addition, this system can also be a tool to reduce the potential for misuse of assistance funds and ensure that social assistance is actually received by those who need it.

Although previous studies have applied Multi-Criteria Decision Making methods such as AHP, MOORA, and other hybrid approaches in various domains, their implementation in the context of village-level social assistance distribution remains limited. Most existing studies focus on sectors such as education, construction, or resource management, while only a few address the specific challenges of social assistance targeting, particularly at the village administrative level where data limitations and subjectivity are prevalent. The novelty of this study lies in the development of a hybrid AHP–MOORA-based decision support system specifically tailored for village social assistance selection, integrating real administrative data and incorporating validation using sensitivity analysis was performed by increasing the weight of individual criteria by 10% to assess the model's stability.

Based on the identified problems, the research questions in this study are, (1) How can a

decision support system based on the AHP–MOORA method be developed to determine eligible village social assistance recipients, (2) How effective is the AHP–MOORA method in producing objective and consistent rankings of potential beneficiaries?, (3) Which criteria have the most significant influence on the determination of social assistance eligibility.

MATERIALS AND METHODS

The research process begins with a needs analysis aimed at understanding the system requirements of village officials involved in the distribution of social assistance. The next step is decision model design, where the AHP-MOORA model will be developed to determine relevant criteria and effective data processing methods. Script and system development is the next stage, where software that implements the decision model is developed using Google Colab, utilizing the power of cloud computing that allows easy accessibility for village users. After development, functionality tests are carried out to ensure that the system works properly according to user needs. Next, the model's accuracy is evaluated by comparing the results generated by the system with real data on social assistance recipients. Validation with village officials is an important step to ensure that the system is acceptable and applicable in the field, as well as to obtain useful input for system refinement before the system is ready for use.



Source: (Research result, 2026)

Figure 1. Methodology

Data

The dataset used in this study consists of 70 candidates obtained from village administrative data. The data collection process was carried out using a combination of documentation and observation techniques. Documentation was used to obtain administrative data from village records, including demographic and socioeconomic information of potential recipients. In addition, limited observations and discussions with village officials were conducted to ensure the relevance and validity of the selected criteria. The data used in this study is considered reliable as it originates from official village records that are routinely updated for administrative and social assistance purposes.

The dataset includes several key variables, such as name, family card number, land ownership, housing conditions, occupation, income, and status (whether or not the person has already received assistance). These variables were selected based on field conditions and their relevance to the process of selecting potential social assistance recipients in the village. This data will be used to develop and test the designed system, as well as to measure the effectiveness and accuracy of the AHP-MOORA model in prioritizing social assistance recipients.

Process of AHP-MOORA

AHP–MOORA begins with the collection and processing of data on potential aid recipients obtained from village administrative data. This data includes a number of attributes that are used as assessment criteria, such as land ownership, housing conditions, type of employment, and income level. The initial data collected is then compiled into a decision matrix that will be used in the next stage of calculation.

The Analytic Hierarchy Process (AHP) is employed to determine the relative importance of each criterion through pairwise comparisons. In this study, a pairwise comparison matrix $A=[a_{ij}]$ is constructed based on the predefined importance scale, where each element a_{ij} represents the relative importance of criterion i over criterion j . The matrix is then normalized by dividing each element by the sum of its corresponding column, expressed as:

$$a_{ij}^* = \frac{a_{ij}}{\sum_{i=1}^n a_{ij}} \quad (1)$$

where a_{ij}^* is the normalized value and n is the number of criteria. The priority vector (weights) w_i is obtained by averaging the normalized values across each row:

$$w_i = \frac{1}{n} \sum_{j=1}^n a_{ij}^* \quad (2)$$

These weights represent the relative importance of each criterion and are subsequently used in the MOORA method. To ensure the reliability of the pairwise comparisons, a consistency check is performed. The maximum eigenvalue λ_{max} is approximated using:

$$\lambda_{max} = \sum_{j=1}^n \left(\sum_{i=1}^n a_{ij} \right) w_{ij} \quad (3)$$

The Consistency Index (CI) and Consistency Ratio (CR) are then calculated as follows:

$$CI = \frac{\lambda_{max} - n}{n - 1}, CR = \frac{CI}{RI} \quad (4)$$

where RI is the Random Index value depending on n. A pairwise comparison matrix is considered consistent if $CR < 0.1$. This consistency verification ensures that the derived weights are logically coherent and suitable for subsequent decision-making processes.

The Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) method is employed to rank alternatives based on multiple criteria that are classified as either benefit or cost. The process begins by constructing a decision matrix $X = [x_{ij}]$, where x_{ij} represents the performance value of the i -th alternative with respect to the j -th criterion. This matrix is then normalized using vector normalization to eliminate differences in measurement scales across criteria, expressed as:

$$x_{ij}^* = \frac{x_{ij}}{\sqrt{\sum_{i=1}^m x_{ij}^2}} \quad (5)$$

where x_{ij}^* is the normalized value and m is the number of alternatives. After normalization, each value is multiplied by its corresponding criterion weight w_j , which is obtained from the AHP method, resulting in a weighted normalized matrix:

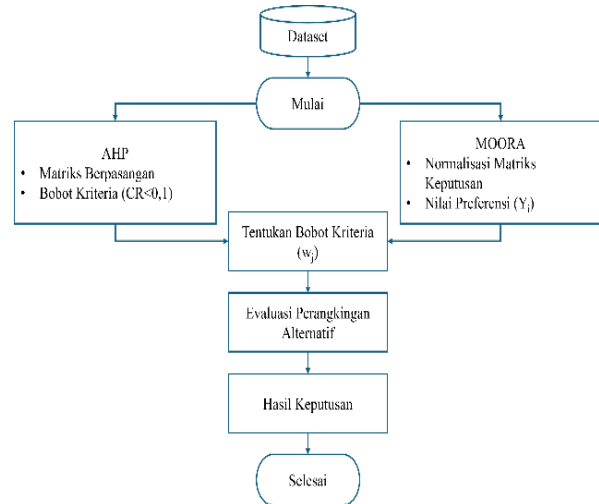
$$v_{ij} = x_{ij}^* \cdot w_j \quad (6)$$

The final step in the MOORA method is to compute the preference value for each alternative by aggregating the benefit and cost criteria. The overall score Y_i for each alternative is calculated as the difference between the sum of weighted benefit criteria and the sum of weighted cost criteria:

$$Y_i = \sum_{j \in B} v_{ij} - \sum_{j \in C} v_{ij} \quad (7)$$

where B denotes the set of benefit criteria and C denotes the set of cost criteria. Alternatives are then ranked based on their Y_i values, with higher values indicating higher priority for assistance. Thus, the MOORA method provides a structured, objective, and interpretable approach for decision-making, particularly when integrated with AHP-based weighting.

The final stage of this process is the ranking of alternatives based on the preference values generated. Alternatives with the highest preference values indicate a higher priority as potential social assistance recipients.



Source: (Research results, 2026)

Figure 2. Flowchart of AHP-MOORA

Evaluation Model with Sensitivity Analysis

The sensitivity analysis is conducted to evaluate the robustness and stability of the AHP-MOORA model when there are changes in the criterion weights. In this study, the analysis is performed by slightly modifying the weight of one criterion, namely Penghasilan (income), by increasing it by 10%. Mathematically, if the original weight vector is $w = [w_1, w_2, \dots, w_n]$, the adjusted weight for criterion k is defined as:

$$w'_k = 1,1 \cdot w_k \quad (8)$$

After adjustment, the weight vector is normalized to ensure that the total weight remains equal to 1:

$$w_j^{new} = \frac{w'_j}{\sum_{j=1}^n w'_j} \quad (9)$$

Using these new weights, the MOORA calculation is repeated, resulting in a new preference value for each alternative:

$$Y'_i = \sum_{j \in B} w_j^{new} \cdot x_{ij}^* - \sum_{j \in C} w_j^{new} \cdot x_{ij}^* \quad (10)$$

where x_{ij}^* represents the normalized decision matrix, B is the set of benefit criteria, and C is the set of cost criteria. This produces a new ranking R'_i , which is then compared to the original ranking R_i . To measure the stability of the model, the correlation between the original and modified rankings is calculated using the Pearson correlation coefficient:

$$r = \frac{\sum_{i=1}^m (R_i - \bar{R})(R'_i - \bar{R}')}{\sqrt{\sum_{i=1}^m (R_i - \bar{R})^2} \sqrt{\sum_{i=1}^m (R'_i - \bar{R}')^2}} \quad (11)$$

where m is the number of alternatives. A high correlation value $r > 0.9$ indicates that the ranking is stable despite changes in weights, meaning the model is robust. Conversely, a low correlation suggests that the model is sensitive to weight variations, indicating potential instability. Therefore, sensitivity analysis is important to check whether the AHP-MOORA model produces stable and reliable results. It helps ensure that the ranking of alternatives does not change significantly when there are small changes in the input weights, indicating that the decision-making process remains consistent and trustworthy.

RESULTS AND DISCUSSION

This study produced a decision support system model to determine potential recipients of village social assistance in an objective and structured manner. The system was developed using a hybrid approach combining the AHP and MOORA methods. AHP was used to determine the weight of each criterion, while MOORA was used to rank the alternatives for potential recipients of social assistance.

Dataset

The dataset contains 9 columns, namely: No, Nomor KK, Nama, Alamat Tinggal, Kepemilikan Tanah, Kondisi Rumah, Pekerjaan, Penghasilan, Status. The dataset briefly represented in table 1, and table 2 represent the mapping categories. This mapping is required to convert the values in the Kepemilikan Tanah, Kondisi Rumah, Pekerjaan, and Penghasilan criteria columns. Specifically, the values in the Penghasilan criterion are converted to High, Medium, and Low. The other three criteria are converted to the values 1, 2, 3, 4, and 5. The raw dataset stated that only 15 person qualified for

accepted the assistance while the 55 person left not deserved it.

Determining Criteria Weight Using AHP

The initial stage in data processing is determining criteria weight using the AHP method. This process begins by compiling a pairwise comparison matrix between criteria based on their level of importance to the objective of determining the eligibility of social assistance recipients. The pairwise comparison matrix is constructed based on the following order of criteria: [Kepemilikan Tanah, Kondisi Rumah, Pekerjaan, Penghasilan].

$$pairwise_matrix = \begin{bmatrix} 1 & 3 & 5 & 7 \\ 1/3 & 1 & 3 & 5 \\ 1/5 & 1/3 & 1 & 3 \\ 1/7 & 1/5 & 1/3 & 1 \end{bmatrix}$$

Then we obtained Normalized Pairwise Comparison Matrix through formula (1).

$$normalize_matrix = \begin{bmatrix} 0.596 & 0.661 & 0.536 & 0.437 \\ 0.199 & 0.220 & 0.321 & 0.312 \\ 0.119 & 0.0073 & 0.107 & 0.187 \\ 0.085 & 0.044 & 0.0036 & 0.062 \end{bmatrix}$$

The calculated weights for the criteria by using formula (2) are: Kepemilikan Tanah: 0.5579 (highest importance), Kondisi Rumah: 0.2633, Pekerjaan: 0.1219, Penghasilan: 0.0569 (lowest importance). After obtaining the weights, λ max obtained from formula (3), so we obtained λ max value is 4.1767. The next step is calculating the Consistency Index and Consistency Ratio with the formula (4), where n is the number of criteria, in this case $n = 4$. So, we have the value of $CI = 0.0589$. A predefined dictionary based on the number of criteria $n = 4$, thus $RI = 0.90$, so we obtained $CR = 0.0654$. This ratio indicates whether the level of inconsistency is acceptable. The CR was 0.0654, which is less than 0.1, indicating that the criteria weights are consistent. As a summary, from AHP we have λ max, CI, and CR, respectively 4.1767, 0.0589, and 0.0654. This values will be used next in MOORA processing for generating ranking list from dataset.

Tabel 1. Dataset in Indonesian

N o	Family Card Number	Name	Address	Land Ownership	House Condition	Job	Inco me	Status
1	3512100101 620010	Mat Hariyanto	Dusun Klampok RT 69 RW 14	Tanah sewa	Bambu Plester	Buruh Bangunan	1.650. 000	Menerim a
2	3512101704 970000	Hariyon o	Dusun Grundo RT 26 RW 06	Tanah Milik Sendiri	Tembok Plester	Wiraswas ta	2.200. 000	Tidak Menerim a
3	3512102501 890000	Santono	Dusun Cemper RT 11 RW 14	Tanah Milik Sendiri	Tembok Bata	Buruh Tani	1.700. 000	Menerim a
...

No	Family Card Number	Name	Address	Land Ownership	House Condition	Job	Income	Status
70	3512101510650001	Maman	Dusun Cemper 1 RT 16 RW 95	Tanah Sewa	Bambu Tanah	Buruh Bangunan	1.200.000	Tidak Menerima

Sumber: (Hasil Penelitian, 2026)

Tabel 2 Mapping Categories (in Indonesian Dataset)

Criteria	1	2	3	4	5
Kepemilikan Tanah	Tanah Milik Sendiri	Tanah Hasil Warisan	Tanah Sewa	Tanah Sengketa	Tanah Milik Pemerintah
Kondisi Rumah	Tembok Keramik	Tembok Bata	Tembok Plester	Bambu Plester	Bambu Tanah
Pekerjaan	Wiraswasta	Buruh Tani	Buruh Bangunan	Tukang Becak	Pengangguran

Source: (Research result, 2026)

Normalization and Ranking Process with MOORA

After the criteria weights were obtained, the next stage was to apply the MOORA method to rank the alternative candidates for social assistance. The alternative data was normalized to eliminate scale differences between criteria, so that all values could be compared fairly.

At this stage, the criteria were divided into benefit criteria and cost criteria, according to their characteristics. The preference value of each alternative is calculated by multiplying the normalization value by the AHP criterion weight, then subtracting the total benefit value from the total cost value.

The MOORA calculation results in a final preference value (Y_i) for each alternative. This value is then used to rank potential social assistance recipients, where the alternative with the highest Y_i value indicates the highest priority for receiving assistance.

Preparation of the Decision Matrix

Each potential aid recipient is designated as alternative A_i and each criterion is designated as C_j . The decision matrix is prepared as follows:

$$X = \begin{bmatrix} x_{11} & x_{12} & x_{13} & x_{14} \\ x_{21} & x_{22} & x_{23} & x_{24} \\ \dots & \dots & \dots & \dots \\ x_{n1} & x_{n2} & x_{n3} & x_{n4} \end{bmatrix}$$

Decision Matrix Normalization

Normalization is performed using the equation (5) which simply illustrate with table 3.

Table 3 Normalization

Alternatif	C1	C2	C3	C4
A1	0,198	0,221	0,240	0,185
A2	0,165	0,187	0,214	0,245
A3	0,231	0,264	0,248	0,162

Source: (research results, 2026)

Matrix Weighting Normalization

Normalization values are multiplied by AHP weights according to formula (6) and illustrate in table 4.

Tabel 4 Weight Normalization

Alternatif	C1	C2	C3	C4
A1	0,039	0,074	0,080	0,025
A2	0,033	0,063	0,072	0,033
A3	0,046	0,088	0,083	0,022

Source: (Research results, 2026)

Final Preference Value Calculation

The MOORA preference value is calculated as formula (7) to determine the ranking. This ranking calculated from Benefit and Cost criteria, each candidate has single row matrix with 1×70 dimension as result, the difference value between this Benefit and Cost namely (Y_i), determine the ranking, where bigger value means highly prioritized. From the calculation we sort top 10 candidates as represent in table 5.

Tabel 5 Top 10 Ranking Result (Dataset in Indonesian)

Name	Address	Land Ownership	House Condition	Job	Income	Status	MOORA_score
Sutijo	Dusun Lor Sawah RT 30 RW 07	Tanah Milik Pemerintah	Tembok Plester	Buruh Tani	1900000	Tidak Menerima	0,194
Suyitno	Dusun Krajan RT 35 RW 14	Tanah Milik Pemerintah	Tembok Bata	Tukang Becak	1350000	Tidak Menerima	0,188
Sahrawi	Dusun Grundo RT 66 RW 26	Tanah Milik Pemerintah	Tembok bata	Buruh bangunan	1200000	Tidak Menerima	0,183

Name	Address	Land Ownership	House Condition	Job	Income	Status	MOORA_score
Jumaiya	Dusun Cemper 2 RT 16 RW 93	Tanah Milik Pemerintah	Tembok Bata	Wiraswasta	1900 000	Tidak Menerima	0,174
Jamalludin	Dusun Krajan 1 RT 09 RW 46	Tanah Sengketa	Tembok Plester	Buruh Tani	1950 000	Tidak Menerima	0,164
Mono	Dusun Cemper RT 91 RW 15	Tanah Sewa	Bambu Tanah	Tukang Becak	1150 000	Tidak Menerima	0,161
Sunarmo	Dusun Blengguen RT 15 RW 81	Tanah Sengketa	Tembok Bata	Pengganggu ran	6000 00	Tidak Menerima	0,158
Maman	Dusun Cemper 1 RT 16 RW 95	Tanah Sewa	Bambu Tanah	Buruh Bangunan	1200 000	Tidak Menerima	0,157
Matriyo	Dusun Lor Sawah RT 29 RW 07	Tanah Sengketa	Tembok Bata	Buruh Bangunan	1700 000	Tidak Menerima	0,152
Miarto	Dusun Klampok RT 13 RW 76	Tanah Sengketa	Tembok Bata	Buruh Tani	1700 000	Tidak Menerima	0,152

Source (Research results, 2026)

Ranking Results Analysis

The ranking results in table 5 show significant differences than the earlier dataset. The raw data shows only 15 citizens eligible for assistance, but with AHP-MOORA this eligibility determined by rank. Meanwhile, the results of AHP-MOORA show that the names of those entitled to receive assistance do meet the criteria for being worthy of assistance. In the initial data, the top 10 names were included in the 'Tidak Menerima' category, whereas in the AHP-MOORA results data, these names were ranked with high scores, meaning they were entitled to priority assistance.

The AHP-derived weights quantify the relative importance of each criterion in the decision-making process, as determined by the pairwise comparisons. A higher weight indicates that the corresponding criterion is considered more significant than criteria with lower weights. In this case, 'Kepemilikan Tanah' is by far the most important criterion, followed by 'Kondisi Rumah', 'Pekerjaan', and 'Penghasilan' being the least important.

In the MOORA method, these AHP weights are applied to the normalized decision matrix. This means that criteria with higher weights will have a greater impact on the weighted normalized matrix, and consequently, on the calculated benefit and cost sums for each alternative. For instance, a small difference in 'Kepemilikan Tanah' scores between two alternatives will lead to a more substantial difference in their MOORA scores compared to the same difference in 'Penghasilan' scores, due to 'Kepemilikan Tanah' having a much higher weight. Ultimately, this ensures that the final MOORA scores and the resulting ranking accurately reflect the decision-maker's preferences and the perceived importance of each criterion, leading to a ranking that prioritizes beneficiaries based on the most critical factors.

Sensitivity Analysis

To assess the robustness of the model, sensitivity analyses were conducted by increasing the weight of individual criteria by 10% and re-evaluating the ranking correlation with the original ranking.

1. Impact of 'Penghasilan' weight increase: Ranking correlation: 0.9997. Model is very stable (robust).
2. Impact of 'Kondisi Rumah' weight increase: Ranking correlation: 0.9997. Model is very stable (robust).
3. Impact of 'Kepemilikan Tanah' weight increase: Ranking correlation: 1.0. Model is very stable (robust).

The high correlation values in all sensitivity tests show that the ranking results remain very consistent and do not change much, even when there are small adjustments to the criteria weights.

CONCLUSION

The AHP method has been proven effective in determining criteria weights objectively and consistently, while the MOORA method is capable of producing clear and measurable alternative rankings. The integration of these two methods results in a system that can assist village governments in making decisions that are more fair, transparent, and accurate. The calculated weights for the criteria using AHP are: Kepemilikan Tanah: 0.5579 (highest importance), Kondisi Rumah: 0.2633, Pekerjaan: 0.1219, Penghasilan: 0.0569 (lowest importance) and the value of CR is 0.0654, which is less than 0.1, indicating that the criteria weights are consistent. The ranking based on AHP-MOORA show significant differences than the earlier dataset. The high correlation values in all sensitivity tests show that the ranking results

remain very consistent and do not change much, even when there are small adjustments to the criteria weights. In the future, this system can be further developed by adding more criteria, integrating it with the village population database, and developing a web-based or mobile interface to make it more accessible to village officials. Thus, the results of this community service are expected to make a real contribution to improving the quality of social assistance management at the village level.

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