Journal of Computer Networks, Architecture and High Performance Computing
Volume 6, Number 3, July 2024
https://doi.org/10.47709/cnapc.v6i3.4389

Submitted : 24 July 2024
Accepted : 30 July 2024
Published : 31 July 2024

Optimizing Decision-Making for Aid Allocation in Underdeveloped Regions Using the MOORA Method

Vera Wijaya [1)*] , Fifto Nugroho[2)] , Kraugusteeliana Kraugusteeliana [3)]
[1*)] Prodi Teknologi Informasi, Fakultas Sains dan Teknologi , Universitas Mahkota Tricom Unggul, Indonesia
[2] Ilmu Komputer, Sistem Komputer, Universitas Bung Karno, Indonesia
[3)]Prodi Sistem Informasi, Fakultas Ilmu Komputer,Universitas Pembangunan Nasional Veteran Jakarta, Indonesia
[1)] verawijaya83@gmail.com , [2)]fiftonugroho@gmail.com , [3)] kraugusteeliana@upnvj.ac.id

ABSTRACT

The allocation of assistance for the Family Hope Program is a process that requires precision to ensure that assistance is given to those most in need. This research develops a Decision Support System (DSS) using the Multi-Objective Optimization on the Basis of Ratio Analysis (MOORA) method for optimizing the selection of beneficiaries in disadvantaged villages which includes criteria used including education, toddlers, pregnant women, disabilities, elderly, income, employment, number of dependents, and house size. Each criterion is normalized and given a weight according to its level of importance. The results show that alternative A2 has the highest optimization value with Yi of 0.254, followed by A8 (0.208) and A5 (0.204). In contrast, alternatives A3 (0.029) and A10 (0.035) have the lowest optimization value. Matrix normalization and criteria weights show the significant influence of the criteria of education, pregnant women, elderly, income, number of dependents, and house size in the selection process. The implementation of DSS with the MOORA method is proven to increase efficiency and accuracy in the selection process of Family Hope Program beneficiaries, reduce subjective errors, and ensure assistance is channeled to those who really need it. Therefore, the MOORA method is recommended as an effective tool to optimize social assistance allocation, increase transparency, and reduce bias in decision-making.

Keywords: Aid Allocation; MOORA Method; Aid Recipient Selection; Underdeveloped Regions

1. INTRODUCTION

The selection process of recipients of the Family Hope Program is an important stage that requires accuracy and precision so that assistance can be given to the right recipients. recipients of the Family Hope Program provides cash assistance to families or individuals who meet predetermined criteria. The main objective of recipients of the Family Hope Program is to reduce poverty and improve the quality of life of beneficiary families by increasing their access to education and health services.

Gara Village is one of the villages that receives recipients of the Family Hope Program assistance from the Ministry of Social Affairs (MoSA). This program aims to improve access and quality of education and health services, especially for very poor households. To ensure the program is well-targeted, accurate data management is required based on criteria such as education, toddlers, pregnant women, disabilities, elderly, income, employment, number of dependents, and house size.

However, the selection process of recipients of the Family Hope Program recipients in Gara Village is still done manually because there is no system that can support data processing effectively. This conventional method often results in errors in data recording and assessment (Valentine et al., 2022). The evaluation of each criterion has not used a decision method that helps the village, so the assessment is still subjective and not transparent (Fahri, 2022; Ramli et al., 2022;

* Corresponding author

Journal of Computer Networks, Architecture and High Performance Computing
Volume 6, Number 3, July 2024
https://doi.org/10.47709/cnapc.v6i3.4389

Submitted : 24 July 2024
Accepted : 30 July 2024
Published : 31 July 2024

Rustiawan et al., 2023). This can lead to errors in the distribution of assistance, where the assessment is carried out based on personal interests, causing the assistance not to be on target.

Previous research shows that the use of the MOORA method in aid allocation decision-making in various sectors has yielded positive results. For example, research by (Muni et al., 2024) who applied MOORA to improve efficiency and accuracy in project prioritisation. The Multi-Objective Optimisation on the basis of Ratio Analysis (MOORA) method has various advantages in multicriteria decision making. Firstly, MOORA simplifies complex decision-making processes by combining multiple criteria into a single model, facilitating the evaluation and comparison of alternatives. MOORA's main advantage is its flexibility, allowing application to different types of problems without significant modifications to the methodology (Sudipa, Kharisma, et al., 2023). This makes MOORA a versatile tool for different areas of decision-making. MOORA is also known for producing optimal and accurate solutions (Lubis et al., 2020; Piantari et al., 2024). The ratio approach used in MOORA normalises data and reduces bias due to scale differences between criteria, ensuring the weight of each criterion is proportional. This results in a more objective and reliable decision. These advantages make MOORA an effective and efficient choice in multicriteria decision making(Kraugusteeliana & Violin, 2024; Nugroho et al., 2023).

Along with the need to improve accuracy and transparency in the selection process, the implementation of a computerized decision support system is needed. This DSS is expected to help reduce errors in decision making by applying predetermined criteria consistently and objectively.

2. LITERATUR REVIEW

In optimizing decision-making for aid allocation in underdeveloped regions, the MOORA (Multi-Objective Optimization by Ratio Analysis) method can be a valuable tool. By considering various criteria simultaneously, such as economic development, government expenditure efficiency, global governance influence, health resource allocation, and aid allocation determinants, a comprehensive approach can be established to enhance aid effectiveness in underdeveloped regions. Research by (Komor, 2020) emphasizes the economic dimension of space, which is crucial in understanding how regional aid can contribute to increasing the investment attractiveness of underdeveloped regions. (Purwanto & Utami, 2023) highlight the importance of government expenditure efficiency in underdeveloped regions, indicating the potential for significant cost reductions through improved allocation strategies. (Yoo, 2021) underscores the role of global governance in Chinese development finance, showcasing the impact of transnational linkages on aid allocation. Delves into the determinants of aid allocation by regional multilateral development banks and United Nations agencies, shedding light on the factors influencing aid distribution. (Du et al., 2022) and (Zhang et al., 2020) provide insights into resource allocation in rural and undeveloped areas, emphasizing the need for comprehensive evaluation systems to guide health resource allocation effectively. Moreover, (Dreher et al., 2021) discuss optimal decision rules in multilateral aid funds, highlighting the importance of governance structures in aid allocation. (Barus et al., 2023) presents a model of aid allocation that considers future poverty alleviation, emphasizing the long-term impact of aid decisions. (Aljonaid et al., 2022) examine the impact of sectoral foreign aid inflows on sectoral growth, indicating the varying effects of aid allocation on different sectors. By synthesizing these diverse perspectives on aid allocation, decision-makers can leverage the MOORA method to prioritize criteria such as economic development, efficiency, governance influence, health resource needs, and long-term poverty alleviation. This holistic approach can enhance aid allocation strategies in underdeveloped regions, ultimately improving development outcomes and maximizing the impact of aid interventions.

3. METHOD

Moora method is a multi-objective system optimizing two or more conflicting attributes simultaneously. This method is applied to solve problems with complex mathematical calculations. Moora was introduced by Brauers and Zavadskas in 2006 (Hutahaean et al., 2023). It was originally introduced by Brauers in 2004 as "Multi-Objective Optimization" which

* Corresponding author

Journal of Computer Networks, Architecture and High Performance Computing
Volume 6, Number 3, July 2024
https://doi.org/10.47709/cnapc.v6i3.4389

Submitted : 24 July 2024
Accepted : 30 July 2024
Published : 31 July 2024

can be used to solve various economic problems (Mahendra et al., 2023; Sudipa, Wardoyo, et al., 2023).

The solution steps of the Multi-Objective Optimazation on The Basic of Ratio Analysis method are:

1. Determines the purpose of identifying the evaluation attributes concerned and inputting the criteria value on an alternative where the value will later be processed and the result will be a decision.
2. Represent all available information for each attribute in the form of a decision matrix. The data in equation (1) represents matrix (Kharisma et al., 2023; Khuangnata et al., 2021). Where xij is the performance measurement of th alternative on j th attribute, m is the number of alternatives and n is the number of attributes. Then a ratio system is developed where each performance of an alternative on an attribute is compared to a denominator that is representative for all alternatives of that attribute.

$$X = \begin{bmatrix} X11 & XIi & XIn \\ XjI & Xji & Xjn \\ XmI & Xni & Xmn \end{bmatrix} \quad (1)$$

Description:
Xij = response of alternative j on attribute i = 1,2, ...
n = Number of attribute targets
j = 1,2, m = number of alternatives

3. Breauers concluded that for the denominator, the best choice is the square root of the sum of the squares of each alternative per attribute. This ratio can be:

$$Xij = \frac{Xij}{\sqrt{\sum_{i=1}^{m} Xij2}} \quad (2)$$

Description:
j = 1,2,
n and x = a dimensionless number in the interval [0,1] that describes the normalized job performance of the alternative and performance j.

4. To determine the multiobjective, the normalized measure is added in the case of maximization for favorable attributes and subtracted in minimization (for unfavorable attributes) or in other words, subtract the maximun and minimum values in each row to get the ranking in each row, if formulated then:

$$yi = \sum_{j=1}^{g} wjXij - \sum_{j=g+1}^{n} wjXij \quad (3)$$

Description:
g = number of attributes that maximize
(n-g) = number of attributes that minimized
wj = weight to j
yi = normalised rating of the 1st alternatives against all attributes

Determining the rank value of the MOORA calculation result yi value can be positive or negative depending on the maximum total (favorable attributes) in the decision matrix. A rank order of yi indicates the last choice. Thus the best alternative has the highest yi value while the worst alternative has the lowest yi value.

* Corresponding author

Journal of Computer Networks, Architecture and High Performance Computing
Volume 6, Number 3, July 2024
https://doi.org/10.47709/cnapc.v6i3.4389

Submitted : 24 July 2024
Accepted : 30 July 2024
Published : 31 July 2024

4. RESULT

Alternative and Criteria Data

Decision support system makers in determining the best employees of course need alternatives as supporting data in making the system. As many people as shown in Table 1 below:

Determining Criteria

In the table determining the criteria contains criteria and a description. The criteria determined include education, toddlers, pregnant women, disabilities, elderly, income, employment, number of dependents, and house size.

Table 1
Criteria Table

Criteria	Description
Education	C1
Toddlers	C2
Pregnant Mom	C3
Disability	C4
Elderly	C5
Income	C6
Jobs	C7
Number of Dependents	C8
House Area	C9

Determination of the Weight of Each Criterion

Determination of the weight of each criterion will be selected directly by the system user. Here is an example of a user's choice.

Table 2
Criteria Weight Value

Criteria	Weight Improvement	Cost/Benefit
Education	0,122	Benefit
Toddlers	0,073	Cost
Pregnant Mom	0,122	Benefit
Disability	0,098	Cost
Elderly	0,122	Benefit
Income	0,122	Benefit
Jobs	0,098	Cost
Number of Dependents	0,122	Benefit
House Area	0,122	Benefit

Determining the Importance Level of Each Criterion

a) Education

* Corresponding author

Journal of Computer Networks, Architecture and High Performance Computing
Volume 6, Number 3, July 2024
https://doi.org/10.47709/cnapc.v6i3.4389

Submitted : 24 July 2024
Accepted : 30 July 2024
Published : 31 July 2024

Table 3
Measure Value Parameters Based on Education (C1)

Education	Value
Not in School	5
SD	4
SMP	3
HIGH SCHOOL	2
Higher Education	1

Based on the table above, it can be seen that, for value 5 will be given to those who are not in school, value 4 will be given to those who have elementary school dependents, value 3 will be given to those who have junior high school dependents, value 2 will be given to those who have high school dependents and value 1 will be given to those who have college dependents.

b) Toddlers

Table 4
Parameterized Measure Value Based on Number of Toddlers (C2)

Toddlers	Value
Available	5
No	1

Based on the table above, the parameter value measures the number of children under five. A value of 5 will be given to those who have dependents under five while a value of 1 will be given to those who do not have dependents under five.

c) Pregnant Mom

Table *5*
Parameter Measure Value Based on Pregnant Women (C3)

Pregnant Mom	Value
pregnant women present	5
no pregnant women	1

Based on the table above, it can be seen that the value parameter for measuring pregnant women can be seen that the value of 5 will be given to those who have dependents of pregnant women, while the value of 1 is given to those who do not have dependents of pregnant women.

d) Disability

Table *6*
Parameterized Measure Value Based on Disability (C4)

Disability	Value
Disability present	5
No disability	1

Based on the table above, it can be seen that a value of 5 will be given to those who have dependents with

* Corresponding author

Journal of Computer Networks, Architecture and High Performance Computing
Volume 6, Number 3, July 2024
https://doi.org/10.47709/cnapc.v6i3.4389

Submitted : 24 July 2024
Accepted : 30 July 2024
Published : 31 July 2024

disabilities, while a value of 1 will be given to those who do not have dependents with disabilities.

e) Elderly

Table 7
Parameterized Measure Value Based on Elderly

Elderly	Value
Elderly present	5
No elderly	1

Based on the table above, the parameter of the measured value for the elderly can be seen that a value of 5 will be given to those who have elderly dependents, while a value of 1 is given to those who do not have elderly dependents.

f) Income

Table 8
Parameters Measure Value Based on Income (C6)

Income	Value
Rp. < 500,000	5
Rp. >500,000 - Rp. 1,500,000	4
Rp. > 1,500,000 - Rp. 2,500,000	3
Rp. > 2,500,000 - Rp. 3000,000	2
Rp. >3,000,000	1

Based on the table above, the income measurement value parameter can be seen that for value 5 will be given to those who have an income of less than Rp. 500,000, value 4 will be given to those who have an income of more than 500,00 to 1,500,000, value 3 for those who have an income of Rp. 1,500,000 to Rp.2,500,000, value 2 for those who have an income of Rp.2,500,000 to Rp. 3,000,000, and value 1 will be given to those who earn more than Rp. 3,000,000.

g) Jobs

Table 9
Parameterized Measured Value Based on Occupation (C7)

Jobs	Value
Not Working	5
Farmers	4
Labor	3
Merchant	2
PNS	1

Based on the table above, the parameters of the job measurement value can be seen that for value 5 will be given to those who do not work, value 4 will be given to those who work as farmers, value 3 will be given to those who work as laborers, value 2 will be given to traders, and value 1 will be given to those who have jobs as civil servants.

h. Number of Dependents

Table 10

Parameter Value Measure Based on Number of Dependents (C8)

* Corresponding author

Journal of Computer Networks, Architecture and High Performance Computing
Volume 6, Number 3, July 2024
https://doi.org/10.47709/cnapc.v6i3.4389

Submitted : 24 July 2024
Accepted : 30 July 2024
Published : 31 July 2024

Number of Dependents	Value
No Dependents	5
>5 Children	4
4 - 5 Children	3
2 - 3 Children	2
1 Child	1

Based on the table above, the parameter of the measured value of the number of dependents can be seen that for value 5 will be given to those who have no dependents, value 4 will be given to those who have more than five children, value 3 is given to those who have four to five dependents, value 2 for those who have two to three dependents, and value 1 for those who have one child.

i. House Area

Table 11.
Parameterized Measured Value Based on House Area (C9)

House Area	Value
<4 x 6 m^2	5
5 x 6 m2	4
7 x 12 m2	3
12 x 9 m2	2
>15 x 13m2	1

Based on the table above, it can be seen that a value of 5 will be given to those who have a house area of less than four by six meters, a value of 4 for those who have a house area of five by six meters, a value of 3 for those who have a house area of seven by twelve meters, a value of 2 for a house area of twelve by nine meters, and for a value of one for those who have a house area of more than fifteen by thirteen meters.

Table 12
Alternative data

Alternative	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**
	Benefit	**Cost**	**Benefit**	**Cost**	**Benefit**	**Benefit**	**Cost**	**Benefit**	**Benefit**
A1	3	1	1	1	5	4	4	3	2
A2	4	1	5	1	5	4	2	4	4
A3	3	5	1	5	1	3	2	2	1
A4	2	1	1	5	5	4	4	3	3
A5	5	5	5	1	5	5	5	2	5
A6	4	1	5	5	1	2	1	2	2
A7	2	5	1	1	5	4	2	1	1
A8	5	1	5	5	5	5	4	3	4
A9	3	5	5	1	5	4	3	3	4
A10	1	5	1	5	1	1	1	4	2

* Corresponding author

Journal of Computer Networks, Architecture and High Performance Computing
Volume 6, Number 3, July 2024
https://doi.org/10.47709/cnapc.v6i3.4389

Submitted : 24 July 2024
Accepted : 30 July 2024
Published : 31 July 2024

Based on the table above, it can be seen that the value of each member has been converted based on predetermined weights.

1. Decision Matrix

$$X_{ij} = \begin{pmatrix} 3 & 1 & 1 & 1 & 5 & 4 & 4 & 3 & 2 \\ 4 & 1 & 5 & 1 & 5 & 4 & 2 & 4 & 4 \\ 3 & 5 & 1 & 5 & 1 & 3 & 2 & 2 & 1 \\ 2 & 1 & 1 & 5 & 5 & 4 & 4 & 3 & 3 \\ 5 & 5 & 5 & 1 & 5 & 5 & 5 & 2 & 5 \\ 4 & 1 & 5 & 5 & 1 & 2 & 1 & 2 & 2 \\ 2 & 5 & 1 & 1 & 5 & 4 & 2 & 1 & 1 \\ 5 & 1 & 5 & 5 & 5 & 5 & 4 & 3 & 4 \\ 3 & 5 & 5 & 1 & 5 & 4 & 3 & 3 & 4 \\ 1 & 5 & 1 & 5 & 1 & 1 & 1 & 4 & 2 \end{pmatrix}$$

2. Matrix Normalization

Based on the normalization calculation above, the matrix normalization value (Xij) is obtained.

$$Xij \begin{pmatrix} 0{,}2762 & 0{,}0877 & 0{,}0877 & 0{,}0877 & 0{,}3748 & 0{,}3333 & 0{,}4082 & 0{,}3333 & 0{,}2041 \\ 0{,}3682 & 0{,}0877 & 0{,}4385 & 0{,}0877 & 0{,}3748 & 0{,}3333 & 0{,}2041 & 0{,}4444 & 0{,}4082 \\ 0{,}2762 & 0{,}4385 & 0{,}0877 & 0{,}4385 & 0{,}075 & 0{,}025 & 0{,}2041 & 0{,}2222 & 0{,}1021 \\ 0{,}1841 & 0{,}0877 & 0{,}0877 & 0{,}4385 & 0{,}3748 & 0{,}3333 & 0{,}4082 & 0{,}3333 & 0{,}3062 \\ 0{,}4603 & 0{,}4385 & 0{,}4385 & 0{,}0877 & 0{,}3748 & 0{,}4167 & 0{,}5103 & 0{,}2222 & 0{,}5103 \\ 0{,}3682 & 0{,}0877 & 0{,}4385 & 0{,}4385 & 0{,}075 & 0{,}1667 & 0{,}1021 & 0{,}2222 & 0{,}2041 \\ 0{,}1841 & 0{,}4385 & 0{,}0877 & 0{,}0877 & 0{,}3748 & 0{,}3333 & 0{,}2041 & 0{,}1111 & 0{,}1021 \\ 0{,}4603 & 0{,}0877 & 0{,}4385 & 0{,}4385 & 0{,}3748 & 0{,}4167 & 0{,}4082 & 0{,}3333 & 0{,}4082 \\ 0{,}2762 & 0{,}4385 & 0{,}4385 & 0{,}0877 & 0{,}3748 & 0{,}3333 & 0{,}3062 & 0{,}3333 & 0{,}4082 \\ 0{,}0921 & 0{,}4385 & 0{,}0877 & 0{,}4385 & 0{,}075 & 0{,}0833 & 0{,}1021 & 0{,}4444 & 0{,}2041 \end{pmatrix}$$

5. Optimizing attributes includes weights in the normalized search:

$$Wj \begin{bmatrix} 0{,}034 & 0{,}006 & 0{,}011 & 0{,}009 & 0{,}046 & 0{,}041 & 0{,}04 & 0{,}041 & 0{,}025 \\ 0{,}045 & 0{,}006 & 0{,}053 & 0{,}009 & 0{,}046 & 0{,}041 & 0{,}02 & 0{,}054 & 0{,}05 \\ 0{,}034 & 0{,}032 & 0{,}011 & 0{,}043 & 0{,}009 & 0{,}031 & 0{,}02 & 0{,}027 & 0{,}012 \\ 0{,}022 & 0{,}006 & 0{,}011 & 0{,}043 & 0{,}046 & 0{,}041 & 0{,}04 & 0{,}041 & 0{,}037 \\ 0{,}056 & 0{,}032 & 0{,}053 & 0{,}009 & 0{,}046 & 0{,}051 & 0{,}05 & 0{,}027 & 0{,}062 \\ 0{,}045 & 0{,}006 & 0{,}053 & 0{,}043 & 0{,}009 & 0{,}02 & 0{,}01 & 0{,}027 & 0{,}025 \\ 0{,}022 & 0{,}032 & 0{,}011 & 0{,}009 & 0{,}046 & 0{,}041 & 0{,}02 & 0{,}014 & 0{,}012 \\ 0{,}056 & 0{,}006 & 0{,}053 & 0{,}043 & 0{,}046 & 0{,}051 & 0{,}04 & 0{,}041 & 0{,}05 \\ 0{,}034 & 0{,}032 & 0{,}053 & 0{,}009 & 0{,}046 & 0{,}041 & 0{,}03 & 0{,}041 & 0{,}05 \\ 0{,}011 & 0{,}032 & 0{,}011 & 0{,}043 & 0{,}009 & 0{,}01 & 0{,}01 & 0{,}054 & 0{,}025 \end{bmatrix}$$

Next calculate the value of Yi, which we can see in the following table.

Table 11
Yi list

* Corresponding author

Journal of Computer Networks, Architecture and High Performance Computing
Volume 6, Number 3, July 2024
https://doi.org/10.47709/cnapc.v6i3.4389

Submitted : 24 July 2024
Accepted : 30 July 2024
Published : 31 July 2024

Alternative	Max (C1+C3+C5+C6+C8+C9)	Min (C2+C4+C7)	Yi (Max-Min)
A1	0,198	0,055	0,143
A2	0,289	0,035	0,254
A3	0,124	0,095	0,029
A4	0,198	0,089	0,109
A5	0,295	0,091	0,204
A6	0,179	0,059	0,12
A7	0,146	0,061	0,085
A8	0,297	0,089	0,208
A9	0,265	0,071	0,194
A10	0,12	0,085	0,035

Determining Rank

Based on the results of the previous optimization value calculation, the results can be sorted from largest to smallest, where the alternative that has the largest optimization value is the selected alternative. We can see in the table below.

Table 12
Determining Ranking

Alternative	Value	Ranking
A2	0,254	1
A8	0,208	2
A5	0,204	3
A9	0,194	4
A1	0,143	5
A4	0,109	6
A7	0,085	7
A10	0,035	8
A3	0,029	9
A6	0,12	10

4. DISCUSSION

The selection process for beneficiaries of the Family Hope Program (PKH) involves various important criteria that must be considered to ensure that the assistance is given to the most needy recipients. In this study, the criteria used include education, under-fives, pregnant women, disabilities, elderly, income, employment, number of dependents, and house size, as shown in Table 1. Each criterion is given a weight that reflects its level of importance, which is determined by the system user (Table 2).

Each criterion has certain parameters of measured values that assign a value based on the actual condition of the recipient, as shown in Table 3 to Table 11. For example, for the education criterion (C1), the highest value is given to individuals who are not in school, while the lowest value is given to individuals with higher education dependents. Similarly, the criteria for children under five (C2), pregnant women (C3), disability (C4), elderly (C5), income (C6), employment (C7), number of dependents (C8), and house size (C9) each have specific value parameters.

* Corresponding author

Journal of Computer Networks, Architecture and High Performance Computing
Volume 6, Number 3, July 2024
https://doi.org/10.47709/cnapc.v6i3.4389

Submitted : 24 July 2024
Accepted : 30 July 2024
Published : 31 July 2024

The weight of each criterion is determined by the system user, with the criteria of education, pregnant women, elderly, income, number of dependents, and house size as benefit criteria, while the criteria of children under five, disability, and employment as cost criteria. Determining these weights is important to measure the relative importance of each criterion in the selection process.

The optimization value is calculated by considering the predetermined criteria weights. Each alternative is assessed based on the relevant criteria and then optimized to produce a value Yi, which is the difference between the maximum value (benefit) and the minimum value (cost) for each alternative.

Based on the results of the optimization value calculation, the alternatives are sorted from largest to smallest. The alternative with the largest optimization value is the one selected as the best beneficiary. Table 3.14 shows the ranking order with A2 as the best beneficiary, followed by A8, A5, and so on.

5. CONCLUSION

The conclusion of the research is that based on the results of calculations and analysis, the proposed DSS shows significant results in optimizing the selection process. Alternative A2 has the highest optimization value with Yi value of 0.254, followed by A8 with Yi value of 0.208, and A5 with Yi value of 0.204. This places A2 as the most prioritized PKH beneficiary, followed by A8 and A5. In contrast, alternatives A3 and A10 have the lowest optimization values of 0.029 and 0.035 respectively, indicating that they are at the lowest priority to receive Family Hope Program assistance. The matrix normalization results show that the criteria of education (C1), pregnant women (C3), elderly (C5), income (C6), number of dependents (C8), and house size (C9) have a significant positive influence (benefit) in the selection process, with values of 0.122 for C1, C3, C5, C6, C8, and C9 respectively. Meanwhile, the criteria of toddler (C2), disability (C4), and occupation (C7) are categorized as costs with lower weight values. The implementation of DSS with the MOORA method is proven to increase efficiency and accuracy in the Family Hope Program recipient selection process. The system helps reduce subjective errors and ensures that assistance is channeled to those who really need it based on objective and measurable criteria.

6. REFERENCES

Aljonaid, N. N., Qin, F., & Zhang, Z. (2022). The Heterogeneous Impact of Sectoral Foreign Aid Inflows on Sectoral Growth: SUR Evidence From Selected Sub-Saharan African and MENA Countries. *Journal of Risk and Financial Management*, *15*(3), 107. https://doi.org/10.3390/jrfm15030107

Barus, A. A. P., Tarigan, I. J., Wijaya, V., & Manullang, S. F. (2023). Implementation of Analytichal Hierarchy Process (AHP) Method in Determining Employee Performance Case Study: Ora Et Labora Shop. *Antivirus: Jurnal Ilmiah Teknik Informatika*, *17*(2), 286–295.

Dreher, A., Simon, J., & Valasek, J. (2021). Optimal Decision Rules in Multilateral Aid Funds. *The Review of International Organizations*, *16*(3), 689–719. https://doi.org/10.1007/s11558-020-09406-w

Du, M., Zhao, Y., Fang, T., Fan, L., Zhang, M., Huang, H., & Mei, K. (2022). Evaluating the Inequality of Medical Resource Allocation Based on Spatial and Non-Spatial Accessibility: A Case Study of Wenzhou, China. *Sustainability*, *14*(14), 8331. https://doi.org/10.3390/su14148331

Fahri, J. (2022). EXPLORING CITIZEN'S SATISFACTION WITH THE INFRASTRUCTURE OF SERVICES AT A LOCAL SEAPORT IN TERNATE, NORTH MALUKU. *Journal of Indonesian Economy and Business: JIEB.*, *37*(2), 103–135.

Hutahaean, J., Nugroho, F., Kraugusteeliana, D. A., & Aini, Q. (2023). *Sistem Pendukung Keputusan*. Yayasan Kita Menulis.

Kharisma, L. P. I., Yahya, S. R., Handayanto, R. T., Gunawan, I. M. A. O., Handika, I. P. S., Hatta, H. R., & Syamil, A.

* Corresponding author

Journal of Computer Networks, Architecture and High Performance Computing
Volume 6, Number 3, July 2024
https://doi.org/10.47709/cnapc.v6i3.4389

Submitted : 24 July 2024
Accepted : 30 July 2024
Published : 31 July 2024

(2023). *METODE SPK FAVORIT DI MASA DEPAN: Teori dan Contoh*. PT. Sonpedia Publishing Indonesia.

Khuangnata, V., Alamsyah, R., & Wijaya, V. (2021). SPK Penentuan Pemberian Beasiswa Dengan Metode Saw. *Methotika: Jurnal Ilmiah Teknik Informatika*, *1*(2), 1–10.

Komor, A. (2020). The Economic Dimension of Space. *European Research Studies Journal*, *XXIII*(Issue 1), 429–452. https://doi.org/10.35808/ersj/1561

Kraugusteeliana, K., & Violin, V. (2024). Application of Decision Support in Performance Assessment of Delivery Services in the E-Commerce Industry. *Jurnal Galaksi*, *1*(1), 53–61.

Lubis, A. I., Sihombing, P., & Nababan, E. B. (2020). Comparison SAW and MOORA Methods with Attribute Weighting Using Rank Order Centroid in Decision Making. *2020 3rd International Conference on Mechanical, Electronics, Computer, and Industrial Technology (MECnIT)*, 127–131. https://doi.org/https://doi.org/10.1109/MECnIT48290.2020.9166640

Mahendra, G. S., Wardoyo, R., Pasrun, Y. P., Sudipa, I. G. I., Putra, I. N. T. A., Wiguna, I. K. A. G., Aristamy, I. G. A. A. M., Kharisma, L. P. I., Sutoyo, M. N., & Sarasvananda, I. B. G. (2023). *IMPLEMENTASI SISTEM PENDUKUNG KEPUTUSAN: Teori & Studi Kasus*. PT. Sonpedia Publishing Indonesia.

Muni, G. D. S., Sudipa, I. G. I., Meinarni, N. P. S., Wiguna, I. K. A. G., & Sandhiyasa, I. M. S. (2024). Comparison of MAGIQ, MABAC, MARCOS, and MOORA Methods in Multi-Criteria Problems. *Sinkron: Jurnal Dan Penelitian Teknik Informatika*, *8*(3), 1286–1301.

Nugroho, F., Triayudi, A., & Mesran, M. (2023). Sistem Pendukung Keputusan Rekomendasi Objek Wisata Menerapkan Metode MABAC dan Pembobotan ROC. *Jurnal Sistem Komputer Dan Informatika (JSON)*, *5*(1), 112–121.

Piantari, N. K. A., Putra, I. N. T. A., Widiastutik, S., & Kartini, K. S. (2024). Comparative Analysis of The MOORA Method for Evaluating The Effectiveness of Scholarship Acceptance. *Jurnal Galaksi*, *1*(1), 22–32.

Purwanto, M. Y. J., & Utami, S. (2023). Government Expenditure Efficiency on Human Development in the Underdeveloped Regions. *Efficient Indonesian Journal of Development Economics*, *6*(1), 60–72. https://doi.org/10.15294/efficient.v6i1.57841

Ramli, Y., Imaningsih, E. S., Shiratina, A., Rajak, A., & Ali, A. J. (2022). Environmental sustainability: To enhance organizational awareness towards green environmental concern. *International Journal of Energy Economics and Policy*, *12*(4), 307–316.

Rustiawan, I., Purwati, S., Kraugusteeliana, K., & Bakri, A. A. (2023). Teknik Penilaian Kinerja Karyawan Menggunakan Metode Behaviour Anchor Rating Scale dalam Pemeringkatan Karyawan Terbaik. *Jurnal Krisnadana*, *2*(3), 403–411. https://doi.org/https://doi.org/10.58982/krisnadana.v2i3.316

Sudipa, I. G. I., Kharisma, L. P. I., Waas, D. V., Sari, F., Sutoyo, M. N., Rusliyadi, M., Setiawan, I., Martaseli, E., Sandhiyasa, I. M. S., & Sulistianto, S. W. (2023). *PENERAPAN DECISION SUPPORT SYSTEM (DSS) DALAM BERBAGAI BIDANG (Revolusi Industri 4.0 Menuju Era Society 5.0)*. PT. Sonpedia Publishing Indonesia.

Sudipa, I. G. I., Wardoyo, R., Hatta, H. R., Sagena, U., Gunawan, I. M. A. O., Zahro, H. Z., & Adhicandra, I. (2023). *MULTI CRITERIA DECISION MAKING: Teori & Penerapan Metode Pengambilan Keputusan dengan MCDM*. PT. Sonpedia Publishing Indonesia.

Valentine, H. M., Ramos, S., Nugroho, F., & Mesran, M. (2022). Penerapan Metode ROC-TOPSIS dalam Keputusan Penerima Program Keluarga Harapan. *Journal of Computer System and Informatics (JoSYC)*, *4*(1), 203–211.

Yoo, E. Y. (2021). Chinese Development Finance and Its Determinants: Does Global Governance Matter? *Development Policy Review*, *39*(3), 471–492. https://doi.org/10.1111/dpr.12514

Zhang, J., Cai, J., He, Z., Pu, C., & Tang, G. (2020). Analysis on the Differences of Health Resources Allocation in Undeveloped Areas of Chongqing, China: A Cross-Sectional Study. *Journal of Service Science and Management*, *13*(02), 244–260. https://doi.org/10.4236/jssm.2020.132016

* Corresponding author