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Decision Support System for Determining Subsidized Food Receipt for Poor Families with SAW Method

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Abstract–In accordance with the regulations set by the Office of Kotasan Village, residents are entitled to receive subsidized food based on specific criteria. To determine who is selected to receive subsidized food and distribute it to low-income families will be conducted by the Kotasan Village Office. As a supporting tool to determine individuals eligible to receive subsidized food, a decision support system is required. Within the decision support system, there are several methods, one of which can be used is the Simple Additive Weighting (SAW) method. In this study, the author will address a case to find the best alternative from certain established criteria by comparing the alternatives using the Simple Additive Weighting (SAW) method. In this evaluation, the alternative Saidi ranks first with a Vi value of 0.910, followed by Zum in second place with a Vi of 0.820. In third position, Arju has a Vi value of 0.761. Meanwhile, the alternative with the lowest rank is Sri with a Vi of 0.425, followed by Supri with a Vi of 0.433 and Paiman with a Vi of 0.461.

Keywords: Decision Support System; Subsidized Food; Simple Additive Weighting

1. INTRODUCTION

The village office is the center of community services and activities in the village, both in the fields of government, empowerment, development, and guidance[1]. One example of the services performed by the Kotasan Village Office is the distribution of subsidized foodstuffs that will be received by the poor. In the distribution of subsidized foodstuffs, data collection is carried out where there are several criteria needed so that the receipt of subsidized foodstuffs can be implemented optimally.

Indicators in the selection of poor people who get subsidized food have several criteria. Among them are people who have poor cards, insufficient income, number of dependents, place of residence, and others. Until now, the distribution of subsidized food provided by the village office has not been fully implemented properly because there are still poor people who have not received it. In order for the distribution of subsidized food to be more objective, of course, it requires a tool, namely an information system that aims to process data so as to produce the information needed, in the form of ranking the community. This information system is known as a decision support system (SPK).

Decision support system or often referred to as SPK is an information system that is often used to assist in making a decision[2][3]. SPK is usually often used by an organization to make decisions from the problems at hand[4]. In SPK there are ranking methods to facilitate decision making, such as Weighted Product (WP), Simple Additive Weighting (SAW), TOPSIS, ELECTRE, and others[5].

In this study the authors used the Simple Additive Weighting (SAW) method to determine the distribution of subsidized foodstuffs at the Kotasan Village Office, Galang District. The results of this study are expected to be able to provide effective decisions that are useful for the Kotasan Village Office in making decisions about people who are entitled to subsidized food.

Currently, there are many studies that contain subsidized food distribution and the application of the SAW method. Among them is research conducted by Ema Yahniar et al in January 2021 by applying the electre method in determining the receipt of subsidized food for poor families. In this study, it is known that a decision support system can be applied to determine the receipt of subsidized food assistance for poor families by assessing each alternative based on predetermined criteria so that it can help the sub-district office in making decisions[6]. The next research was conducted in March 2019 by Muqorobin et al by discussing scholarship acceptance by applying the SAW method, in this study it was explained that the SAW method could produce the best ranking for prospective scholarship recipients, help the Scholarship Selection Team in decision making, and determine scholarship recipients based on the type of BP and BKM scholarships and the quota needed[7]. Research that implements the SAW method in the selection of paper plans was conducted by Rakhmat Dedi et al in March 2023, the results of calculations by applying the SAW method in this study found that the alternative or plano 65 x 90cm Toko Indah Sari gets the highest value of 94, 29%[8]. Research conducted in November 2020 by Rusliyawati et al by implementing SAW in the selection of social customer relationship management models, the results of calculations in this study indicate that youtube social media with a value of 0.888 is the recommended social media to be used as a college business strategy[9]. Further research was conducted by Siska Kristiana and Andreas Gerhard in February 2021 by applying the SAW method in the process of recruiting prospective employees, it is known that the alternative that has the highest value is alternative A12 with a value of 4.34 which can be used as a consideration chosen to become an employee[10].

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2. RESEARCH METHODOLOGY

2.1 Research Stages

In conducting research at the Kotasan Village Office, the author conducted several stages of data collection methods used to obtain the data needed by the author, namely:

1. Field Research
   At this stage the author conducts research directly. In this initial stage there are several methods including observation, interviews with leaders or employees of the village office, related to the poor who receive subsidized food.
2. Library Research
   At this stage the author reads books and articles related to research conducted previously by several experts, also related to the methods used by the author in the decision support system in determining recipients of subsidized food for poor families.
3. Analysis and Testing
   At this stage the author takes several data samples. A total of 20 data samples about poor families who will receive subsidized food, the author also takes samples of attributes and criteria that have been determined by the Kotasan Village Office in choosing who is entitled to receive subsidized food. The author will perform ranking using the Simple Additive Weighting (SAW) method to determine 3 families who will get subsidized food.
4. Research Results and Resume
   In this last stage, the author will get poor families who are entitled to receive subsidized materials, and the author can also write a report on the research he conducted.

The picture of the research stages above can be seen in Figure 1 below.

Figure 1. Research Stages

2.2 Decision Support System

A decision support system is a tool or platform specifically designed to assist individuals or teams in the decision-making process[11][12]. This system provides a variety of information, analysis, and tools needed to process and analyze relevant data. By using analytical techniques and mathematical models, decision support systems can produce more efficient and precise solutions or recommendations[13][14].

The main objective of decision support systems is to improve the quality of decision-making by reducing uncertainty and ambiguity[15]. Through the integration of data, technology, and analysis methods, these systems are able to present clear and accurate information to decision makers. In addition, decision support systems also allow users to perform simulations, scenarios, and predictive analysis, thus allowing them to understand the impact of various decisions that may be taken[16].

2.3 Subsidized Foodstuffs

Food is a basic need for human consumption obtained from agricultural, vegetable and animal products[17][18]. Subsidized food is a budget that has been set by the central government for underprivileged people. Subsidized food is usually in the form of rice which will be distributed to people who are entitled to get it.

2.4 Metode Simple Additive Weighting

The Simple Additive Weighting (SAW) method is often referred to as the weighted sum method that ranks each alternative on all existing attributes[19][20]. The SAW method requires a normalization process of the decision matrix (X_ij) to a scale that can be compared with all existing alternative ratings[21]. The stages of the SAW Method are as follows:

1. Preparing the Decision Matrix

$$X_{ij} = \begin{bmatrix} X_{11} & X_{12} & - & X_{1n} \\ X_{21} & X_{22} & - & X_{2n} \\ - & - & - & - \\ X_{m1} & X_{m2} & - & X_{mn} \end{bmatrix} \quad (1)$$

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In a decision-making context, the decision matrix X_{ij} is a structured table that represents the performance or evaluation of alternatives based on multiple attributes or criteria. Here, iii denotes the index of the alternative, which corresponds to the rows of the matrix, while j represents the index of the attribute or criterion, corresponding to the columns. The value of nnn refers to the total number of attributes considered in the analysis, and mmm represents the total number of alternatives being compared. Each element X_{ij} contains the performance score or measurement of the i-th alternative with respect to the j-th attribute. This matrix serves as the foundation for applying multi-criteria decision-making (MCDM) methods, enabling systematic comparison and selection of the most suitable alternative.

2. Calculating the Normalization Matrix (R_{ij})

$$R_{ij} = \begin{cases} \frac{X_{ij}}{Max\ X_{ij}} \rightarrow If\ j\ is\ a\ benefit\ attribute \\ \frac{Min\ X_{ij}}{X_{ij}} \rightarrow \quad If\ j\ is\ a\ cost\ attribute \end{cases} \quad (2)$$

The normalized matrix R_{ij} is obtained by transforming the decision matrix X_{ij} into a comparable scale across all criteria. In this process, each element of the decision matrix is adjusted based on the highest value $Max\ X_{ij}$ and the lowest value $Min\ X_{ij}$ within the same column j. This normalization ensures that variations in measurement units or value ranges do not influence the decision-making process. By scaling the data proportionally, each criterion contributes fairly to the overall analysis. As a result, the normalized matrix provides a standardized foundation for further evaluation or ranking in multi-criteria decision-making methods.

3. Calculating Preference Value (V_i)
In this final stage to determine the ranking value of each alternative. A greater value of (V_i) indicates that the alternative (A_i) is more selected.

$$V_i = \sum_{j=1}^{n} W_j R_{ij} \quad (3)$$

In this context, V_i represents the preference value for the iii-th alternative, which indicates the overall score or ranking outcome after evaluating all relevant criteria. The term W_j refers to the weight assigned to the j-th criterion, reflecting its relative importance in the decision-making process. Meanwhile, R_{ij} denotes the normalized matrix value for the iii-th alternative under the jjj-th criterion, ensuring that all criteria are scaled consistently for fair comparison. Here, j represents the index of the criteria or attributes being assessed, while n signifies the total number of criteria or attributes considered in the evaluation. Together, these components form the basis for a systematic multi-criteria decision-making method, where normalization, weighting, and preference calculation are combined to produce objective and comparable results.

3. RESULTS AND DISCUSSION

One of the problems faced in determining who is entitled to receive subsidized foodstuffs in Kotasan Village is the large number of people who apply to get benefits from the government. Therefore, the Village Head and Village Staff need to rank the people who have registered, by finding the best alternative.

Based on this problem, the author makes a Decision Support System for Determining Subsidized Food Receipts for Poor Families with the Saw Method at the Kotasan Village Office. The following are the criteria for receiving subsidized food for poor families:

Table 1. Criteria Data

Criteria Code	Criteria Name
C_1	Underprivileged Card
C_2	Income
C_3	Number of Dependents
C_4	House Condition
C_5	Electricity Bill per Month

Table 1 displays the criteria data with five main variables: C1 for Poor Card, C2 for Income, C3 for Number of Dependents, C4 for House Condition, and C5 for Electricity Bill per Month. These criteria are used as a reference in analyzing or assessing the economic condition and welfare of a person or family.

Table 2. Alternative Data

Alternative Code	Alternate Name
A1	Marutik
A2	Saidi
A3	Sri

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Alternative Code	Alternate Name
A4	Puji
A5	Lusi
A6	Poniran
A7	Paiman
A8	Parno
A9	Mukiran
A10	Zum
A11	Tukiyo
A12	Tumin
A13	Heri
A14	Ngatijo
A15	Supri
A16	Mujiah
A17	Dian
A18	Ono
A19	Arju
A20	Dona

Table 2 displays alternative data with 20 entries coded from A1 to A20. These alternatives refer to the criteria listed in Table 1. Each of these alternative codes can be used as a representation of each individual or family in the analysis or assessment process.

In this SAW method, it is necessary to determine the attributes of each criterion and choose the weights. This is to choose the use of the weight value of each criterion for the selection process. Decision making gives weight to each criterion, namely:

Table 3. Criteria for Receiving Subsidized Foodstuffs

Criteria	Variable	Type	Weight
Underprivileged Card	C_1	Benefit	25%
Income	C_2	Benefit	20%
Number of Dependents	C_3	Benefit	20%
House Condition	C_4	Benefit	20%
Electricity Bill per Month	C_5	Benefit	15%

Table 3 presents the criteria for receiving subsidized food along with the variables, types and weights given to each criterion. Based on the table, the highest weight is given to the Poor Card criteria (C1) at 25%, followed by Income (C2) and Number of Dependents (C3) each with a weight of 20%. Furthermore, House Condition (C4) has a weight of 20%, and Electricity Bill per Month (C5) has a weight of 15%. This table is a guideline in determining the receipt of subsidized food based on predetermined criteria.

Table 4. Criteria Weighting C_1

Rate	Weight
Don’t Have	2
Own	3

Table 4 shows the weighting of criteria for the Poor Card (C1) and House Condition (C4). For the Poor Card, the value 'Do not have' is given a weight of 2, while 'Have' gets a weight of 3. This table is used to calculate the total score of each alternative based on predetermined criteria.

Table 5. Criteria Weighting C_4

Rate	Weight
Rumbiah Wall, Earth Floor	5
Plank Wall, Plank Floor	4
Cement Wall, Earth Floor	3
Cement Wall, Cement Floor	2
Cement Wall, Crammed Floor	1

Whereas in the House Condition criteria, weights are given based on the type of wall and floor. Rumbiah walls with dirt floors received the highest weight of 5, followed by a combination of plank walls with plank floors and cement walls with dirt floors which received a weight of 4. Furthermore, Cement Walls with Cement Flooring has a weight of 3, Cement Walls with Crammed Flooring a weight of 2, and the combination of Cement Walls with Earth Flooring gets a weight of 1. This table is used to calculate the total score of each alternative based on

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predetermined criteria. The following table 6 shows the data on those who have registered for subsidized food in Kotasan Village.

Table 6. Data on Prospective Recipients of Subsidized Foodstuffs

Alternative Code	Alternative Name	Criteria				
		C_1	C_2	C_3	C_4	C_5
A1	Marutik	Own	300.000	3	Cement Wall, Cement Floor	50.000
A2	Saidi	Own	200.000	5	Cement Wall, Earth Floor	50.000
A3	Sri	Don't have	700.000	1	Cement Wall, Crammed Floor	90.000
A4	Puji	Don't have	1.000.000	1	Cement Wall, Cement Floor	50.000
A5	Lusi	Don't have	1.500.000	5	Cement Wall, Crammed Floor	120.000
A6	Poniran	Don't have	1.000.000	2	Cement Wall, Crammed Floor	200.000
A7	Paiman	Don't have	500.000	2	Cement Wall, Cramped Floor	130.000
A8	Parno	Don't have	400.000	2	Cement Wall, Cement Floor	80.000
A9	Mukiran	Don't have	1.500.000	3	Cement Wall, Cement Floor	50.000
A10	Zum	Own	1.000.000	6	Cement Wall, Earth Floor	50.000
A11	Tukiyo	Don't have	800.000	3	Cement Wall, Cement Floor	50.000
A12	Tumin	Don't have	700.000	2	Cement Wall, Cement Floor	50.000
A13	Heri	Don't have	800.000	2	Cement Wall, Cement Floor	70.000
A14	Ngatijo	Own	500.000	4	Cement Wall, Earth Floor	50.000
A15	Supri	Don't have	700.000	1	Cement Wall, Crammed Floor	100.000
A16	Mujiah	Own	600.000	3	Cement Wall, Cement Floor	90.000
A17	Dian	Don't have	1.000.000	1	Cement Wall, Crammed Floor	120.000
A18	Ono	Don't have	400.000	2	Cement Wall, Cement Floor	120.000
A19	Arju	Don't have	1.500.000	3	Cement Wall, Earth Floor	100.000
A20	Dona	Don't have	800.000	2	Cement Wall, Cement Floor	120.000

Table 6 presents data on potential recipients of subsidized food, with each alternative coded from A1 to A20. The data includes the status of ownership of the Kurang Mampu Card, the amount of income, the number of dependents, the condition of the house, and the electricity bill per month. This data is used for the process of determining the receipt of subsidized food based on predetermined criteria. From Table 6, it produces a match rating between alternatives and criteria.

Table 7. Suitability Rating

Alternative Code	Criteria				
	C_1	C_2	C_3	C_4	C_5
A1	3	300.000	3	2	50.000
A2	3	200.000	5	3	50.000
A3	2	700.000	1	1	90.000
A4	2	1.000.000	1	2	50.000
A5	2	1.500.000	5	1	120.000
A6	2	1.000.000	2	1	200.000
A7	2	500.000	2	1	130.000
A8	2	400.000	2	2	80.000
A9	2	1.500.000	3	2	50.000
A10	3	1.000.000	6	3	50.000
A11	2	800.000	3	2	50.000
A12	2	700.000	2	2	50.000
A13	2	800.000	2	2	70.000
A14	3	500.000	4	3	50.000
A15	2	700.000	1	1	100.000
A16	3	600.000	3	2	90.000
A17	2	1.000.000	1	1	120.000
A18	2	400.000	2	2	120.000
A19	2	1.500.000	3	3	100.000
A20	2	800.000	2	2	120.000

Table 7 displays the suitability rating for each alternative candidate for subsidized food recipients based on predetermined criteria. This suitability rating reflects the extent to which each alternative meets the predetermined criteria and is used as the basis for determining the receipt of subsidized food. The next stage of the Saw method is to create a decision matrix from the match rating that has been generated.

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1. Preparing the Decision Matrix

$$X_{ij} = \begin{bmatrix} 3 & 300000 & 3 & 2 & 50000 \\ 3 & 200000 & 5 & 3 & 50000 \\ 2 & 700000 & 1 & 1 & 90000 \\ 2 & 1000000 & 1 & 2 & 50000 \\ 2 & 1500000 & 5 & 1 & 120000 \\ 2 & 1000000 & 2 & 1 & 200000 \\ 2 & 500000 & 2 & 1 & 130000 \\ 2 & 400000 & 2 & 2 & 80000 \\ 2 & 1500000 & 3 & 2 & 50000 \\ 3 & 1000000 & 6 & 3 & 50000 \\ 2 & 800000 & 3 & 2 & 50000 \\ 2 & 700000 & 2 & 2 & 50000 \\ 2 & 800000 & 2 & 2 & 70000 \\ 3 & 500000 & 4 & 3 & 50000 \\ 2 & 700000 & 1 & 1 & 100000 \\ 3 & 600000 & 3 & 2 & 90000 \\ 2 & 1000000 & 1 & 1 & 120000 \\ 2 & 400000 & 2 & 2 & 120000 \\ 2 & 1500000 & 3 & 3 & 100000 \\ 2 & 800000 & 2 & 2 & 120000 \end{bmatrix}$$

$$\text{Max} = 3 \quad 1500000 \quad 6 \quad 3 \quad 200000$$

2. Calculating the Normalized Matrix $(\mathrm{R_{ij}})$

For Criterion C1 (Benefit) using the formula equation (2)

$R_{1.1} = \frac{1}{3} = 1$

$R_{2.1} = \frac{3}{3} = 1$

$R_{3.1} = \frac{2}{3} = 0{,}667$

$R_{4.1} = \frac{2}{3} = 0{,}667$

$R_{5.1} = \frac{2}{3} = 0{,}667$

$R_{6.1} = \frac{2}{3} = 0{,}667$

$R_{7.1} = \frac{2}{3} = 0{,}667$

$R_{8.1} = \frac{2}{3} = 0{,}667$

$R_{9.1} = \frac{2}{3} = 0{,}667$

$R_{10.1} = \frac{3}{3} = 1$

$R_{11.1} = \frac{2}{3} = 0{,}667$

$R_{12.1} = \frac{2}{3} = 0{,}667$

$R_{13.1} = \frac{2}{3} = 0{,}667$

$R_{14.1} = \frac{3}{3} = 1$

$R_{15.1} = \frac{2}{3} = 0{,}667$

$R_{16.1} = \frac{3}{3} = 1$

$R_{17.1} = \frac{2}{3} = 0{,}667$

$R_{18.1} = \frac{2}{3} = 0{,}667$

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$R_{19.1} = \frac{2}{3} = 0{,}667$

$R_{20.1} = \frac{2}{3} = 0{,}667$

Perform calculations as above to produce normalized values C2 to C4. The results obtained for the normalized matrix $(\mathrm{R_{ij}})$ are:

$$\mathrm{R_{ij}} = \begin{bmatrix} 1 & 0{,}2 & 0{,}6 & 0{,}667 & 0{,}23 \\ 1 & 0{,}133 & 0{,}833 & 1 & 0{,}23 \\ 0{,}667 & 0{,}467 & 0.167 & 0{,}333 & 0{,}45 \\ 0{,}667 & 0{,}667 & 0.167 & 0{,}667 & 0{,}25 \\ 0{,}667 & 1 & 0{,}833 & 0{,}333 & 0{,}6 \\ 0{,}667 & 0{,}667 & 0{,}333 & 0{,}333 & 1 \\ 0{,}667 & 0{,}333 & 0{,}333 & 0{,}333 & 0{,}65 \\ 0{,}667 & 0{,}267 & 0{,}333 & 0{,}667 & 0{,}4 \\ 0{,}667 & 1 & 0{,}6 & 0{,}667 & 0{,}25 \\ 1 & 0{,}667 & 1 & 1 & 0{,}25 \\ 0{,}667 & 0{,}533 & 0{,}6 & 0{,}667 & 0{,}25 \\ 0{,}667 & 0{,}467 & 0{,}333 & 0{,}667 & 0{,}25 \\ 0{,}667 & 0{,}533 & 0{,}333 & 0{,}667 & 0{,}35 \\ 1 & 0{,}333 & 0{,}167 & 1 & 0{,}25 \\ 0{,}667 & 0{,}467 & 0{,}167 & 0{,}333 & 0{,}5 \\ 1 & 0{,}4 & 0{,}6 & 0{,}667 & 0{,}45 \\ 0{,}667 & 0{,}667 & 0{,}167 & 0{,}333 & 0{,}6 \\ 0{,}667 & 0{,}267 & 0{,}333 & 0{,}667 & 0{,}6 \\ 0{,}667 & 1 & 0{,}6 & 1 & 0{,}5 \\ 0{,}667 & 0{,}533 & 0{,}333 & 0{,}667 & 0{,}6 \end{bmatrix}$$

3. Find the Preference Value (V_i) by using the formula equation (3)

$\mathrm{V_1} = \sum(0{,}25 * 1) + (0{,}2 * 0{,}2) + (0{,}2 * 0{,}6) + (0{,}2 * 0{,}667) + (0{,}15 * 0{,}23) = 0{,}557$

$\mathrm{V_2} = \sum(0{,}25 * 1) + (0{,}2 * 0{,}133) + (0{,}2 * 0{,}833) + (0{,}2 * 1) + (0{,}15 * 0{,}23) = 0{,}910$

$\mathrm{V_3} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 0{,}467) + (0{,}2 * 0{,}167) + (0{,}2 * 0{,}333) + (0{,}15 * 0{,}45) = 0{,}425$

$\mathrm{V_4} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 0{,}667) + (0{,}2 * 0{,}167) + (0{,}2 * 0{,}667) + (0{,}15 * 0{,}25) = 0{,}602$

$\mathrm{V_5} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 1) + (0{,}2 * 0{,}883) + (0{,}2 * 0{,}333) + (0{,}15 * 0{,}6) = 0{,}6$

$\mathrm{V_6} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 0{,}667) + (0{,}2 * 0{,}333) + (0{,}2 * 0{,}333) + (0{,}15 * 1) = 0{,}581$

$\mathrm{V_7} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 0{,}333) + (0{,}2 * 0{,}333) + (0{,}2 * 0{,}333) + (0{,}15 * 0{,}65) = 0{,}461$

$\mathrm{V_8} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 0{,}267) + (0{,}2 * 0{,}333) + (0{,}2 * 0{,}667) + (0{,}15 * 0{,}4) = 0{,}478$

$\mathrm{V_9} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 1) + (0{,}2 * 0{,}6) + (0{,}2 * 0{,}667) + (0{,}15 * 0{,}25) = 0{,}656$

$V_{10} = \sum(0{,}25 * 1) + (0{,}2 * 0{,}667) + (0{,}2 * 1) + (0{,}2 * 1) + (0{,}15 * 0{,}25) = 0{,}820$

$V_{11} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 0{,}533) + (0{,}2 * 0{,}6) + (0{,}2 * 0{,}667) + (0{,}15 * 0{,}25) = 0{,}562$

$V_{12} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 0{,}467) + (0{,}2 * 0{,}333) + (0{,}2 * 0{,}667) + (0{,}15 * 0{,}25) = 0{,}495$

$V_{13} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 0{,}533) + (0{,}2 * 0{,}333) + (0{,}2 * 0{,}667) + (0{,}15 * 0{,}35) = 0{,}523$

$V_{14} = \sum(0{,}25 * 1) + (0{,}2 * 0{,}333) + (0{,}2 * 0{,}167) + (0{,}2 * 1) + (0{,}15 * 0{,}25) = 0{,}586$

$V_{15} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 0{,}467) + (0{,}2 * 0{,}167) + (0{,}2 * 0{,}333) + (0{,}15 * 0{,}5) = 0{,}433$

$V_{16} = \sum(0{,}25 * 1) + (0{,}2 * 0{,}4) + (0{,}2 * 0{,}6) + (0{,}2 * 0{,}667) + (0{,}15 * 0{,}45) = 0{,}650$

$V_{17} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 0{,}667) + (0{,}2 * 0{,}167) + (0{,}2 * 0{,}333) + (0{,}15 * 0{,}6) = 0{,}488$

$V_{18} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 0{,}267) + (0{,}2 * 0{,}333) + (0{,}2 * 0{,}667) + (0{,}15 * 0{,}6) = 0{,}508$

$V_{19} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 1) + (0{,}2 * 0{,}6) + (0{,}2 * 1) + (0{,}15 * 0{,}5) = 0{,}761$

$V_{20} = \sum(0{,}25 * 0{,}667) + (0{,}2 * 0{,}533) + (0{,}2 * 0{,}333) + (0{,}2 * 0{,}667) + (0{,}15 * 0{,}6) = 0{,}561$

From the results of the preference value above, the final result is obtained, namely:

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Table 8. Final Results

Alternative	Name	Vi	Rating
A1	Marutik	0,557	12
A2	Saidi	0,910	1
A3	Sri	0,425	20
A4	Puji	0,602	7
A5	Lusi	0,698	4
A6	Poniran	0,581	9
A7	Paiman	0,461	18
A8	Parno	0,478	17
A9	Mukiran	0,656	5
A10	Zum	0,820	2
A11	Tukiyo	0,562	10
A12	Tumin	0,495	15
A13	Heri	0,523	13
A14	Ngatijo	0,586	8
A15	Supri	0,433	19
A16	Mujiah	0,650	6
A17	Dian	0,488	16
A18	Ono	0,508	4
A19	Arju	0,761	3
A20	Dona	0,561	11

Table 8 displays the final results of the evaluation of alternatives with different names. In this assessment, Saidi's alternative is ranked first with a Vi value of 0.910, followed by Zum with the second rank and Vi value of 0.820. In the third position, Arju has a Vi value of 0.761. Meanwhile, the lowest ranked alternative is Sri with a Vi value of 0.425, followed by Supri with a value of 0.433 and Paiman with a value of 0.461. This evaluation provides an overview of the performance and ranking of each alternative based on predetermined criteria.

4. CONCLUSIONS

From the results and discussion, it can be concluded that the decision support system using the simple additive weighting method is very helpful in determining the receipt of subsidized food in Kotasan Village due to the large number of people who volunteered as alternatives so that by using this method the Village Head and village staff can decide on one or more of the best alternatives that will receive subsidized food from the Kotasan Village Office. Based on the results of evaluating alternatives with different names, it is concluded that Saidi's alternative is ranked first with the highest Vi value of 0.910. Followed by the Zum alternative with the second rank and Vi value of 0.820. In the third position, there is an alternative Arju with a Vi value of 0.761. Meanwhile, the lowest ranked alternative is Sri with a Vi value of 0.425, followed by Supri with a value of 0.433 and Paiman with a value of 0.461. This evaluation clearly provides an overview of the performance and ranking of each alternative based on predetermined criteria.

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