Decision Support System for Suitability of Horticultural Agricultural Plant Types with Land Conditions Using Interpolation Profile Matching

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Abstract - Horticultural crops are the most produced by farmers in the Napugera Village area because they are more profitable to cultivate because they are short in life and from an economic point of view they are obtained faster. However, has often experienced obstacles, one of which is determining the suitability of agricultural land for horticultural crops. Determining the selection of horticultural crops for the types of red onion, red red chili, and tomato crops on a field based on land conditions is very necessary for farmers in the Napugera Village area as a support for decision-making. There are 8 criteria assessed including temperature, rainfall, air humidity, soil type, soil texture, soil ph, land slope and topography. In this study, a profile-matching interpolation method was developed for a decision-making system that can be used as a tool in providing decisions on plants that are suitable for planting in a field easily, quickly, and accurately. The profile-matching interpolation method is one of the methods of scoring data. The results showed that the type of onion horticultural crop with a final value of 3,764 is suitable for cultivation in the Napugera Village area.

Keywords: Decision Support System (DSS), Plant Selection, Land Condition, Profile Matching Interpolation

I. INTRODUCTION

Decision-making is a very complex undertaking that is explained by many parameters: the number of choice options, the time to decide, perceptual uncertainty, personal experience, the subjective assessment of the possible events, and more importantly, the internal subjective neural coding that we assign to various choices, based on individual preferences [1]. For decades, the research community has developed decision-making methods, as tools to support decision-making for adequate sustainable development in agricultural supply chains [2]. One of the decision-making is the evaluation of land suitability is a procedure for assessing the prospects for land use for alternative purposes [3]. The use of land for agriculture is considered a critical area in the scientific literature [4]. In general, land suitability evaluation is the process of assessing the performance of land when it is used for a specific purpose [5]-[6]. Evaluation of land suitability including climate, soil, and topographic components, along with an understanding of biophysical constraints, is used to determine land suitability. The evaluation process is a crucial stage in the progress of agricultural activities. The main objective of the evaluation of the suitability of agricultural land foresees land prospects and land constraints for the production of agricultural crops [7].

Napugera Village is one of the villages that has the most extensive agricultural land in the Mego District, Sikka Regency, East Nusa Tenggara Province (NTT). The total area of agricultural land is 1,389 Ha [8]. The large area of agricultural land in Napugera Village makes this area have agricultural commodities, one of which is horticultural crops. Horticultural crops are the most widely produced crops in the Napugera Village area because they are more profitable to cultivate. After all, they are short-lived and from an economic point of view, they are obtained faster. In addition, currently in each region Sikka Regency is getting a special policy from the Coordinating Ministry for Economic Affairs of the Republic of Indonesia in implementing the horticultural *Closed Loop* Partnership program which is a program for the first district in NTT Province [9].

Horticultural cultivation efforts for red onion, red chili, and tomato crops in Napugera Village often experience obstacles, one of which is the suitability of agricultural land for horticultural crops, because the productivity of horticultural crops depends on the quality of the land used. Currently, the determination of land for the cultivation of horticultural crops for the types of onion, Red Chili, and tomato crops in Napugera Village is still not as harmonious, sometimes even forcing on the use of land for horticultural crops. In addition, farmers' lack of knowledge and understanding of the characteristics of the land to be cultivated and the type of horticultural crops to be planted, and the difficulty of obtaining correct data on land characteristics, can make it difficult for farmers to determine the suitability of their land. To obtain all the necessary knowledge, of course, it takes a long time and a large cost, it is necessary to implement a decision-making support system to determine the suitability of horticultural crops for types of onion, Red Chili, and tomato plants with land conditions in the Napugera Village area.

Based on literature obtained from Google Scholar for the last five years (2018-2022), 11 studies discuss decision support systems related to determining land suitability, namely 4 studies using the Profile Matching method [10]–[13], studies using the SAW method [14], studies using the AHP method [11], Moora [15] the rest of the study used Overlay [13], Spacial Decision Tree [16], Forward Chaining [17], FAHP dan FIS [18], FMADM [14].

In this study, the profile-matching interpolation method was applied to the decision-making system based on criteria or parameters that affect the suitability of the land with the type of horticultural crop. The interpolation method is used for data scoring, this method is adapted from linear interpolation which is used to estimate a value based on two other values. It is automatically applied to map alternate values to the specified range of values [19]. The main result of this study is expected to be able to build a Decision Support System (DSS) for the selection of the best alternative horticultural crops with suitable land in the Napugera Village area, Sikka Regency.

II. METHOD

This research was conducted in Napugera Village, Sikka Regency, East Nusa Tenggara Province. This study collected data using observation, interviews, and literature studies. The method for decision-making uses the Profile Matching Interpolation method as shown in Fig. 1.

A. Data Collection

1) Observation : Conducting direct observations on the Napugera Village area of Sikka Regency which has agricultural commodity products and other relevant government agencies, namely the Agriculture Office, and the Central Statistics Agency of Sikka Regency related to agricultural commission information.

2) Interview: Conducting research by directly interviewing farmers (producers) of agricultural commodities related to land and climate conditions in the Napugera Village area and other relevant government agencies, namely the Agriculture Office, and the Central Statistics Agency of Sikka Regency related to information on determining the area of horticultural agricultural commodity providers.

3) Literature Studies: Conducting research by studying and reading literature that has to do with the problem that is the object of research which includes book literature and e-books, papers, regulations from the government, and other scientific reports.

B. Profile Matching Interpolation Method

The model evaluated the ideal profile of land conditions with horticultural crop types in the Napugera Village area [10] based on parameters obtained from the Agricultural Research and Development Agency of the Ministry of Agriculture of the Republic of Indonesia [20], and produced recommendations for providing horticultural crop types. To optimize the recommended results of the Profile Matching method, an interpolation weighting method is applied that calculates the degree of proximity of the land condition profile to the type of horticultural crop more accurately. Metode profile matching interpolation has several stages:

1) *Model of land suitability with horticultural crop types.*
2) *Knowledge Base Creation:*
   - Data on the ideal profile of land suitability with horticultural crop types from the Agricultural Research and Development Agency of the Ministry of Agriculture of the Republic of Indonesia.
   - Ideal data on the conditions and climate in the Napugera Village area from the Sikka District Agriculture Office.

3) Matching the suitability of land and climate conditions in the Napugera Village area with the ideal profile of land suitability with horticultural crop types (Table I, II, III).

4) Computational Interpolation Profile Matching Method

III. RESULT AND DISCUSSION

Based on the ideal profile of suitability of horticultural crop types and land condos from the tables mentioned before, the computation of land suitability data with horticultural crop types for the Napugera Village region using the profile matching interpolation method was carried out. Land data from Napugera Village is shown in Table IV in this area, while the parameters values of profile matching interpolation are presented from Table V to XII.

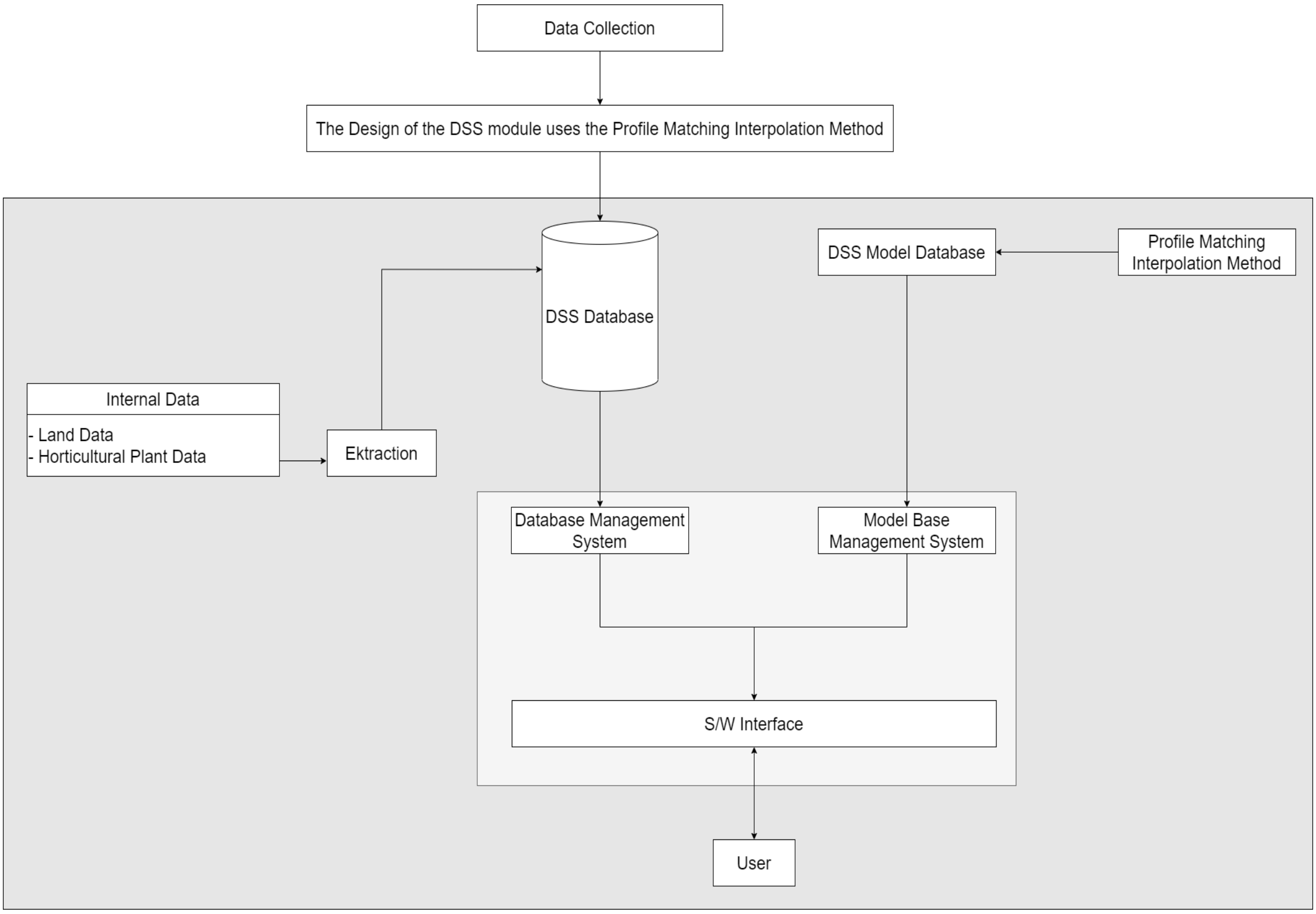

Fig. 1 Decision support system structure of land compliance with horticultural plant types using the profile matching interpolation method

TABLE I
ASSESSES THE PARAMETERS OF THE IDEAL PROFILE OF THE LAND TO THE TYPE OF HORTICULTURAL CROP OF RED ONION

Parameters	Interpolation Value Calculation
Temperature (25 – 32)	$Score(x) = \begin{cases} 5, & if\ 25 \le x \le 32 \\ \frac{5-1}{25-0}(x-0)+1, & if\ 0 \le x < 25 \\ \frac{1-5}{57-32}(x-32)+5, & if\ 32 < x < 57 \\ 1, & if\ x \ge 57 \end{cases}$
Rainfall (300- 2500)	$Score\ (x) = \begin{cases} 5, & if\ 300 \le x \le 2500 \\ \frac{5-1}{300-0}(x-0)+1, & 0 \le x < 300 \\ \frac{1-5}{2800-2500}(x-2500)+5, & if\ 2500 < x < 2800 \\ 1, & if\ x \ge 2800 \end{cases}$
Air Humidity (80 - 90)	$Score\ (x) = \begin{cases} 5, & if\ 80 \le x \le 90 \\ \frac{5-1}{80-0}(x-0)+1, & if\ 0 \le x < 80 \\ \frac{1-5}{100-90}(x-90)+5, & if\ 90 < x < 170 \\ 1, & if\ x \ge 170 \end{cases}$
Soil Type (Alluvial)	$Score\ (x) = \begin{cases} 5, x = & In\ accordance \\ 1, x = & not\ In\ accordance \end{cases}$
Soil Texture (Clay loam)	$Score\ (x) = \begin{cases} 5, x = & In\ accordance \\ 1, x = & not\ In\ accordance \end{cases}$
Soil Ph (5.6 – 6.5)	$Score\ (x) = \begin{cases} 5, & if\ 5{,}6 \le x \le 6{,}5 \\ \frac{5-1}{5{,}6-0}(x-0)+1, & if\ 0 \le x < 5{,}6 \\ \frac{1-5}{12{,}1-6{,}5}(x-6{,}5)+5, & if\ 6{,}5 < x < 12{,}1 \\ 1, & if\ x \ge 12{,}1 \end{cases}$
Land Slope (≤ 30)	$Score\ (x) = \begin{cases} 5, & if\ x \le 30 \\ \frac{1-5}{60-30}(x-30)+1, & if\ 30 < x < 60 \\ 1, & if\ x \ge 60 \end{cases}$
Topography (700 – 1000)	$Score\ (x) = \begin{cases} 5, & if\ 700 \le x \le 1000 \\ \frac{5-1}{700-0}(x-0)+1, & if\ 0 \le x \le 700 \\ \frac{1-5}{1700-1000}(x-1000)+5, & if\ 1000 < x < 1700 \\ 1, & if\ x \ge 1700 \end{cases}$

TABLE II
ASSESSES THE PARAMETERS OF THE IDEAL PROFILE OF THE LAND TO THE TYPE OF HORTICULTURAL CROPS OF RED CHILI

Parameters	**Interpolation Value Calculation**
Temperature (18 – 26)	$Score\ (x) = \begin{cases} 5, & if\ 18 \le x \le 26 \\ \frac{5-1}{25-0}(x-0)+1, & if\ 0 \le x < 18 \\ \frac{1-5}{44\ -\ 26}(x-26)+5, & if\ 26 < x < 44 \\ 1, & if\ x\ \ge\ 44 \end{cases}$
Rainfall (600- 1200)	$Score\ (x) = \begin{cases} 5, & if\ 600 \le x \le 1200 \\ \frac{5-1}{600\ -0}(x-0)+1, & if\ 0 \le x < 600 \\ \frac{1-5}{1800\ -\ 1200}(x-1200)+5, & if\ 1200 < x < 1800 \\ 1, & if\ x\ \ge\ 1800 \end{cases}$
Air Humidity (18 - 30)	$Score\ (x) = \begin{cases} 5, & if\ 18 \le x \le 30 \\ \frac{5-1}{18\ -0}(x-0)+1, & if\ 0 \le x < 18 \\ \frac{1-5}{48\ -\ 30}(x-30)+5, & if\ 30 < x < 48 \\ 1, & if\ x\ \ge\ 48 \end{cases}$
Soil Type (Alluvial)	$Score\ (x) = \begin{cases} 5, x = & In\ accordance \\ 1, x\ = & not\ In\ accordance \end{cases}$
Soil Texture (Clay loam)	$Score\ (x) = \begin{cases} 5, x = & In\ accordance \\ 1, x\ = & not\ In\ accordance \end{cases}$
Soil Ph (5.5 – 6.8)	$Score\ (x) = \begin{cases} 5, & if\ 5{,}5 \le x \le 6{,}8 \\ \frac{5-1}{5{,}5\ -0}(x-0)+1, & if\ 0 \le x < 5{,}5 \\ \frac{1-5}{12{,}3\ -\ 6{,}8}(x-6{,}8)+5, & if\ 6{,}8 < x, 12{,}3 \\ 1, & if\ x\ \ge\ 12{,}3 \end{cases}$
Land Slope (≤ 25)	$Score\ (x) = \begin{cases} 5, & if\ x \le 25 \\ \frac{1-\ 5}{50\ -\ 25}(x-25)+1, & if\ 25 < x < 50 \\ 1, & if\ x\ \ge\ 50 \end{cases}$
opography (900 – 1800)	$Score\ (x) = \begin{cases} 5, & if\ 900 \le x \le 1800 \\ \frac{5-1}{900\ -0}(x-0)+1, & if\ 0 \le x < 900 \\ \frac{1-5}{2700\ -\ 1800}(x-1800)+5, & if\ 1800 < x < 2700 \\ 1, & ifx\ \ge\ 2700 \end{cases}$

TABLE III
ASSESSES THE PARAMETERS OF THE IDEAL PROFILE OF THE LAND TO THE TYPE OF HORTICULTURAL CROPS OF TOMATO

Parameters	Interpolation Value Calculation
Temperature (18 – 26)	$Score(x) = \begin{cases} 5, & if\ 18 \le x \le 26 \\ \frac{5-1}{25-0}(x-0)+1, & if\ 0 \le x < 18 \\ \frac{1-5}{44-26}(x-26)+5, & if\ 26 < x < 44 \\ 1, & if\ x \ge 44 \end{cases}$
Rainfall (400- 700)	$Score\ (x) = \begin{cases} 5, & if\ 400 \le x \le 700 \\ \frac{5-1}{400-0}(x-0)+1, & if\ 0 \le x < 400 \\ \frac{1-5}{1100-700}(x-700)+5, & if\ 700 < x < 1100 \\ 1, & jika\ x \ge 1100 \end{cases}$
Air Humidity (35 - 80)	$Score\ (x) = \begin{cases} 5, & if\ 35 \le x \le 80 \\ \frac{5-1}{35-0}(x-0)+1, & if\ 0 \le x < 35 \\ \frac{1-5}{115-80}(x-80)+5, & if\ 80 < x < 115 \\ 1, & jika\ x \ge 115 \end{cases}$
Soil Type (Androsol)	$Score\ (x) = \begin{cases} 5, x = & In\ accordance \\ 1, x = & not\ In\ accordance \end{cases}$
Soil Texture (Loose sandy loam)	$Score\ (x) = \begin{cases} 5, x = & In\ accordance \\ 1, x = & not\ In\ accordance \end{cases}$
Soil Ph (5.5 – 7.0)	$Score\ (x) = \begin{cases} 5, & if\ 5{,}5 \le x \le 7{,}0 \\ \frac{5-1}{5{,}5-0}(x-0)+1, & if\ 0 \le x < 5{,}5 \\ \frac{1-5}{12{,}5-7{,}0}(x-7{,}0)+5, & if\ 7{,}0 < x < 12{,}5 \\ 1, & if\ x \ge 12{,}5 \end{cases}$
Land Slope(≤ 45)	$Score\ (x) = \begin{cases} 5, & if\ x \le 45 \\ \frac{1-5}{90-45}(x-45)+1, & if\ 45 < x < 90 \\ 1, & if\ x \ge 90 \end{cases}$
Topography (350 – 750)	$Score\ (x) = \begin{cases} 5, & if\ 350 \le x \le 750 \\ \frac{5-1}{350-0}(x-0)+1, & if\ 0 \le x < 350 \\ \frac{1-5}{1100-750}(x-750)+5, & if\ 750 < x < 1100 \\ 1, & jika\ x \ge 1100 \end{cases}$

TABLE IV
NAPUGERA VILLAGE LAND DATA

Village : Napugera Land area: 1. 389 Ha Subdistrict: Mego County: Sikka Province: NTT	
Climate	
Temperature	26 ^{0}C
Rainfall	1250 mm/yr
Air Humidity	77,5 %
Land Conditions	
Soil Type	Regosol
Soil Texture	Sandy loam
Soil Ph	6.5 cm
Soil Slope	60
Place Height	920 mdpl

A. Temperature (Napugera Village: 26 ^{0}C)

- Red Onion: $\text{Score}\ (26) = 5$
- Red Chili: $Score\ (26) = 5$
- Tomato: $\text{Score}\ (26) = 5$

B. Rainfall (Napugera Village: 1250 mm/yr)

- Red Onion: $\text{Score}\ (1250) = 5$
- Red Chili: $\text{Score}\ (1250) = \frac{1-5}{1800-1200}(1250 - 1200) + 5$= 2,567
- Tomato: $\text{Score}\ (1250) = 1$

C. Air Humidity (Napugera Village: 77.5%)

- Red Onion : $\text{Score}\ (77{,}5) = \frac{5-1}{80-0}(77{,}5 - 0) + 1 = 3{,}875$
- Red Chili: $\text{Score}\ (77{,}5) = 1$
- Tomato: $\text{Score}\ (77{,}5) = \frac{1-5}{115-80}(77{,}5 - 80) + 5$= -0,286

D. Soil Type (Napugera Village: Regosol)

- Red Onions: $\text{Score}\ (Regosol) = 1$
- Red Chili: $\text{Score}\ (Regosol) = 1$
- Tomato: $\text{Score}\ (Regosol) = 5$

TABLE V
RESULT OF TEMPERATURE INTERPOLATED VALUES

Plant Type	Ideal Profile	Napugera Village Land Temperature Data	Score (interpolated result)
Red Onion	25 – 32	26	5
Red Chili	18 – 26	26	5
Tomato	18- 28	26	5

TABLE VI
RAINFALL INTERPOLATION VALUE RESULTS

Alternative	Ideal Profile	Napugera Village Land Rainfall Data	Score (interpolated result)
Red Onion	300 – 2500	1250	5
Red Chili	600 - 1200	1250	2,567
Tomato	400 - 700	26	1

TABLE VII
RESULT OF AIR HUMIDITY INTERPOLATION VALUE

Alternative	Ideal Profile	Napugera Village Land Humidity Data	Score (interpolated result)
Red Onion	80 – 90	77,5	3,875
Red Chili	18 – 30	77,5	1
Tomato	35 – 80	77,5	-2,286

TABLE VIII
THE RESULT OF THE INTERPOLATION VALUE OF THE SOIL TYPE

Alternative	Ideal Profile	Land Type Data of Napugera Village	Score (interpolated result)
Red Onion	Alluvial, Glei Humus, Latosol	Regosol	1
Red Chili	Alluvial and Mediterranean	Regosol	1
Tomato	Androsol, regosol, latosol and grumosol	Regosol	5

E. Soil Texture (Napugera Village: Sandy loam)

- Red Onions: $\text{Score} = 1$
- Red Chili: $\text{Score} = 1$
- Tomato: $\text{Score} = 5$

F. Soil Ph (Napugera Village: 6.5 cm)

- Red Onion: $\text{Score} = 5$
- Red Chili: $\text{Score} = 5$
- c. Tomato: $\text{Score} = 5$

TABLE IX
SOIL TEXTURE INTERPOLATION VALUE RESULTS

Alternative	Ideal Profile	Napugera Village Land Texture Data	Score (interpolated result)
Red Onion	Clay clay	Sandy loam	1
Red Chili	Dusty clay clay	Sandy loam	1
Tomato	Sandy loam	Sandy loam	5

TABLE X
SOIL PH INTERPOLATION VALUE RESULTS

Alternative	Ideal Profile	Napugera Village Land Ph Data	Score (interpolated result)
Red Onion	5,6 - 6,5	6,5	5
Red Chili	5,5 - 6,8	6,5	5
Tomato	5,5 - 7,0	6,5	5

G. Slope of the land (Napugera Village: 60%)

- Red Onion: $\text{Score}\ (60) = \frac{1-5}{60-30}\ (60 - 30) +$ 1=-4,133
- Red Chili: $\text{Score}\ (60) = 1$
- Tomato: $\text{Score}\ (60) = \frac{1-5}{90-45}\ (60 - 45) + 1 = -1{,}867$

H. Topography (Napugera Village: 920 masl)

- Red Onion : $\text{Score}\ (920) = 5$
- Red Chili: $\text{Score}\ (920) = 5$
- Tomato: $\text{Score} = \frac{1-5}{1100-750}\ (920 - 750) + 5$= -2,000

I. Determination and Calculation of Core Factor and Secondary Factor Values

Among the two criteria for determining the suitability of land with the type of horticultural crops, namely climate criteria, which are the *core factors*, namely the sub-criteria for rainfall and air humidity with consideration of water content greatly affecting plants, while the *second factor* is the temperature sub-criteria with plant considerations adjusting to the magnitude of the temperature.

Meanwhile, the criteria for land conditions that are *core factors*, namely sub-criteria for soil type, soil texture, soil Ph, and Land Slopewith consideration of soil characteristics are very influential on plants,

TABLE XI
RESULTS OF LAND SLOPEINTERPOLATION VALUES

Alternative	Ideal Profile	Napugera Village Land Slope Data	Score (interpolated result)
Red Onion	≤ 30	60	-4,133
Red Chili	≤ 25	60	1
Tomato	≤ 45	60	-1,867

TABLE XII
TOPOGRAPHIC INTERPOLATION VALUE RESULTS

Alternative	Ideal Profile	Napugera Village Land Topography Data	Score (interpolated result)
Red Onion	700 -	920	5
Red Chili	900 -	920	5
Tomato	350 -	920	-2,000

while the *second factor* is the topographic sub-criteria with plant considerations adjusting to the height of the place. The following are the calculation of the core factor and secondary factor values, using (1) and (2). The results of values calculated from (1) and (2) are shown in Table XIII and XIV.

$$NCF = \frac{\sum NC}{\sum IC} \quad (1)$$

with NCF: Average *core factor* value; ∑NC: total number of *core factor* values; ∑IC: Number of *core factor* items

$$NSF = \frac{\sum NS}{\sum IS} \quad (2)$$

with NSF: *Average secondary factor* value; ∑NS: total number of *secondary factor* values; ∑IS: Number of *secondary factor* items

TABLE XIII
CORE FACTOR AND CLIMATE SECONDARY FACTOR

Plant Type	Core Factor			Secondary Factor	
	Rainfall	Air Humidity	Core Factor Value	Temperature	Value of Secondary Factor
Red Onion	5	3,875	$NCF = \frac{5 + 3{,}875}{2} = 4{,}438$	5	$NCF = \frac{5}{1} = 5$
Red Chili	2,567	1	$NCF = \frac{2{,}567 + 1}{2} = 1{,}784$	5	$NCF = \frac{5}{1} = 5$
Tomato	1	-2,286	$NCF = \frac{1 + -2{,}286}{2} = -0{,}643$	5	$NCF = \frac{5}{1} = 5$

TABLE XIV
CORE FACTOR AND SECONDARY FACTOR LAND CONDITION

Plant Type	Core Factor				Secondary Factor	
	Soil Type	Soil Texture	Soil Ph	Core Factor Value	Topography	Value of Secondary Factor
Red Onion	1	1	5	$NCF = \frac{1+1+5}{3} = 3{,}500$	5	$NCF = \frac{5}{5} = 1$
Red Chili	1	1	5	$NCF = \frac{1+1+5}{3} = 3{,}500$	5	$NCF = \frac{5}{5} = 1$
Tomato	5	5	5	$NCF = \frac{5+5+5}{3} = 7{,}500$	-2,000	$NCF = \frac{-2{,}000}{5} = -0{,}4$

J. Calculating the total value of the core factor and secondary factor using (3)

$$Total\,Value = (x)\%NCF + (x)\%NSF \quad (3)$$

with:
NCF: average *core factor* value
NSF: secondary *factor* average value
(x)%: the value of the percent inputted

Among the two criteria, namely climate criteria and land condition, where the climate criteria are inputted 70% for *core factor* values with consideration because two subcriteria greatly affect plant growth and 30% for secondary factors (Table XV and XVI).

Meanwhile, the land condition criterion, where the climate criterion of the percent value is inputted 80% for *the core factor* value with consideration because three subcriteria greatly affect plant growth and 20% for *secondary factors.*

K. Squeezing (using (4))

$$Ranking = (x1)\%NT1 + (x2)\%NT2 + \ldots + (xn)\%NTn \quad (4)$$

with:
x: the percentage inputted
NT: the total value of the criteria

Between the two criteria, namely climate criteria and land condition, the number of percentages inputted are 60% climate with consideration as a profile matching target, while land conditions are 40% (Table XVII).

TABLE XV
TOTAL CLIMATE VALUE

Plant Type	Core Factor	Secondary Factor	Total Value Calculation	Total Value
Red Onion	4,438	5	(70% x 4,438) + (30% x 5)	4,607
Red Chili	1,784	5	(70% x 1,784) + (30% x 5)	2,749
Tomato	−0,643	5	(70% x -0.643) + (30% x 5)	1,050

TABLE XVI
TOTAL VALUE OF LAND CONDITION

Plant Type	Core Factor	Secondary Factor	Total Value Calculation	Total Value
Red Onion	3,500	1	(60% x 3,500) + (40% x 1)	2,500
Red Chili	3,500	1	(60% x 3,500) + (40% x 1)	2,500
Tomato	7,500	−0,4	(60% x 7,500) + (40% x -0.4)	4,340

TABLE XVII
RANK CALCULATION

Plant Type	Total Value		Rank Calculation	Final Results	Rank
	Climate	Land Conditions			
Red Onion	4,607	2,500	(60% x 4,607) + (40% x 2,500)	3,764	1
Red Chili	2,749	2,500	(60% x 2,749) + (40% x 2,500)	2,649	2
Tomato	1,050	4,340	(60% x 1,050) + (40% x 4,340)	2,366	3

From the results of the calculations above, Red Onions are horticultural agricultural crops that are most suitable for the climate and land conditions in the Napugera Village area based on 8 criteria assessed including temperature, rainfall, air humidity, soil type, soil texture, soil pH, soil slope and topography. While the second alternative is Red Chili, and the third alternative is Tomat.

IV. CONCLUSION

The results of this study concluded that a decision support system to provide recommendations on the suitability of horticultural cropland with land conditions can be built using the profile matching interpolation method which produces types of Red Onion horticultural crops with the final score of 3,764 which is suitable for cultivation in the Napugera Village area based on 8 criteria assessed including temperature, rainfall, air humidity, soil type, soil texture, soil pH, soil slope and topography. This result also provides recommendations for the objectives expected by the relevant p ihak, namely the horticultural agriculture and the Sikka District Agricultural Office. As for the next research, it should use other conformity methods to see the comparison that occurs with this study.

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