THE APPLICATION OF FORWARD CHAINING METHOD TO DETERMINE THE SUITABILITY OF PALAWIJA CROPLAND BASED ON GIS WEB

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ABSTRACT

Crops or second crop after rice, usually planted by residents when the water is not sufficient to grow rice, in addition to requiring a long time rice requires a lot of water, while crops are not, crops can be grown only by water every day, or not at all depending on soil moisture itself. Dryland farmers in Lampung are always faced with crop failure due to land resources have not been exploited to the maximum such as climate, soil type, rainfall, humidity, and others.

Suitability determination system of crop land is intended to facilitate the farmers to get information about the suitability of land crops. Method development in these applications using the System Development Life Cycle Waterfall model which has several stages, namely, planning, analysis, design, implementation and sistem.Penelitian produces a detection system of crop land suitability for web-based so that farmers can get information anywhere and anytime effectively and efficiently.

KEY WORDS

Land Suitability, Forward Chaining, Plant Crops

1. Introduction

1.1 Background

A second plant crops planted in fields or paddy, pulses commonly called a second crop and fits in well in the near rice planting, the plant is also resistant to drought. Dryland farmers in Lampung are always faced with crop failure due to land resources have not been exploited to the maximum such as climate, soil type, rainfall, humidity, and others. For more than a decade in Lampung have been changes in rainfall patterns. The results also reveal that changes in rainfall patterns that have occurred in Lampung has led to changes in cropping patterns. Agro-climatic zones in Lampung have been many changes. Based on this fact, dryland farmers who still use traditional farming techniques are always exposed to poverty due to frequent crop failures due to ignorance of the land resource information. Therefore we need a system that can provide information about the suitability of land crops.

Expert System for land suitability based WebGIS crops can provide information about the suitability of land crops and crops deployment location in Lampung Province with a clear, fast, and accurate, whether in the form of maps and data. Geographic Information Systems

have strived to become a means of accessing information fast spread of crops. Taking into consideration the existing conditions it would require Web-based GIS Expert System to determine the suitability of land crops, this system is a computer-based system designed to increase the effectiveness of the settlement in solving problems in determining the suitability of land and mapping the locations of crops.

1.2 Research Objectives

1. Build and produce an expert system that can assist in determining the suitability of land and mapping the locations of crops.

2. Applying Forward Chaining method as one method of solving a problem by making the system design and build software.

2. Theoretical

2.1 Forward Chaining

The approach driven by the data (data driven). In this approach the tracking starts from the input information and then try to describe the conclusion. The rules in the system represents the actions that should be taken if there is a special condition on those items in working memory called the set of condition-action rules. In this method, the data used to determine which rules will be executed, then the rule is executed. Perhaps the process of adding data to the working memory. The process is repeated until a result is found. Activities performed by the system know-act cycle (Recognize-act) .Pelacakan forward appropriate for facts from the IF of IF-THEN rules.

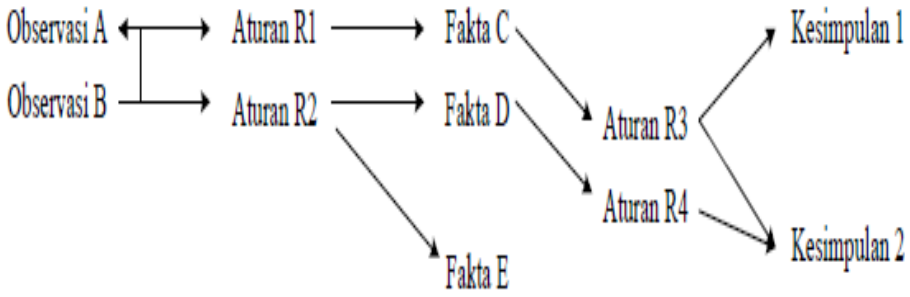

Figure 2.1 Process Forward Chaining

2.2 Classification of land suitability

Based on the level of detail of the data available on each scale mapping, land suitability classes are divided into:

1. For the semi-detailed level mapping (scale 1: 25000-1: 50000) at the class level, land belonging to the order corresponding (S) are classified into three classes, namely: the land is very suitable (S1), is quite suitable (S2),and marginally suitable (S3). While the land belonging to the order does not match (N) are not differentiated into classes.
2. To review the level mapping (scale 1: 100000-1: 250,000) at grade level appropriate differentiated classes (S), corresponding conditional (CS) and is not suitable (N).

2.3 Quality and Characteristics of Land

Land quality is the identifier or properties that are complex from a plot of land. Each land has a quality performance of which affect the suitability for a specific use and usually consists of one or more characteristics of the land. Land quality Nothing could be estimated or measured directly in the field, but is generally determined based on the characteristics of the land (FAO, 1976) .yaitu: Temperature / Temperature, Rainfall, drainese, Texture Soil Erosion Hazard.

2.4 Palawija

Crops literally means "second crop". The word is derived from Sanskrit: phaladwija ('second product') and is the second next harvest rice. In that sense now, crops means all seasonal agricultural crops planted on dry land. Normally crops such as legumes, cereals other than rice (such as corn), and seasonal tubers (cassava and sweet potato).

2.5 Component System (Subsystem) GIS (Geographic Information System)

Some of the subsystems in a Geographic Information System include: Input, Manipulation, Data Management, Query, Analysis, Visualization (Data Output).

3. Research Methods

Data collection methods are as follows: The literature research, field research (observation, interviews, documentation)

3.1 Schematic Representation

To build the knowledge base used a knowledge representation scheme. Schematic representation used are: Needs Data, Methods of organizing Organizing .This method using a matrix table, which lists Plant Crops and growth requirements, can be seen in the table below:

Table 3.1 Plant Crops

No	Plant crops
1	corn
2	cassava
3	Talas
4	peanut
5	soybeans
6	Long bean
7	Cucumber

Table 3.2 Characteristics of Land

No	code	Characteristics of Land
1	A1	Temperature

2	A2	Rainfall
3	A3	Drainage
4	A4	Soil texture
5	A5	Erosion hazard

Table 3.3 Land

No	Kode	Land
1	B1	Hot
2	B2	Cold
3	B3	Low Rainfall
4	B4	Rainfall Average
5	B5	Rainfall torrential
6	B6	drainage Hampered
7	B7	Good drainage
8	B8	Quick drainage
9	B9	Soil Texture Coarse
10	B10	Somewhat Rough Soil Texture
11	B11	Soil texture bit muddy
12	B12	Erosion hazard Large
13	B13	Erosion hazard Medium
14	B14	Erosion hazard Low

3.2 Method of Software Development

In this research, software engineering where the process is referred to apply systems engineering System Development Life Cycle (SDLC) with the Waterfall model and is implemented as follows: Planning (Planning), Analysis (Analytic)

3.3 Proposed System

Explanation of the system proposed in this study using context diagrams and Data Flow Diagrams (DFD).

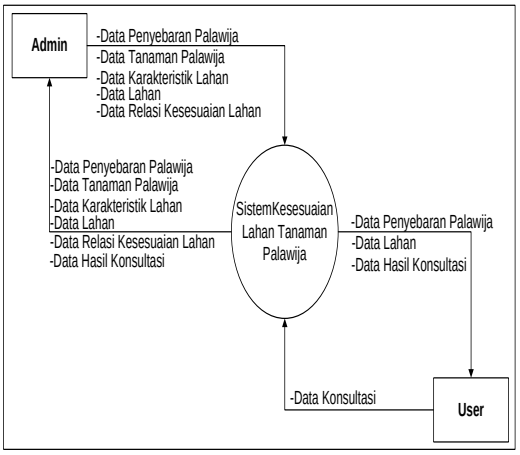

Figure 3.1 Data Context Diagram

4. Results And Discussion

4.1 Determination of Land Suitability Results Page

On this page there are results Land Suitability Determination. Can be seen in figure 4.1 below.

Figure 4.1 Determination of Land Suitability Results Page

4.2 Page Map Spread

This page contains a map of the spread of crops in Lampung province. Can be seen in Figure 4.2 below.

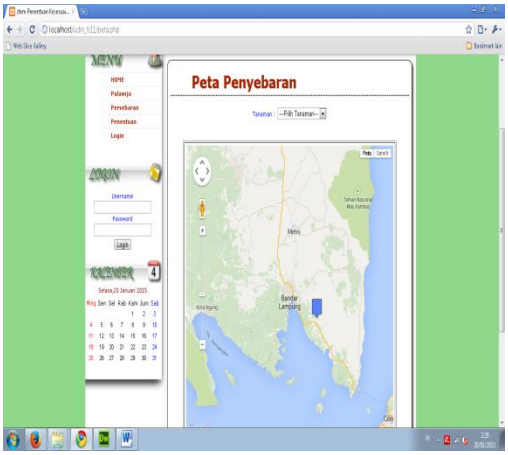

Figure 4.2 Page Map Spread

4.3 Deployment Guide

On this page there is a list of coordinates spread of crops. Can be seen in Figure 4.3 below.

Figure 4.3 Deployment Guide

4.4 Testing

The software testing function to determine the achievement of objectives based on the criteria. In this case the test is done with by connecting each entity of the system in accordance with the specifications of the hardware and software. Application performance testing is applied only to applications relating to database processing in the program Dreamweaver 8 and MySQL database. Adapaun testing was done by varying the number of databases that must be executed. Besides the performance of the software that is related to the condition of the used database connectivity.

5. Conclusion

Based on the analysis and discussion of the problem, the conclusions of this study are as follows:

a. Land Suitability System Plant Crops Using Forward Chaining method has been done in computerized and run a website.

b. Land Suitability System Plant Crops Forward Chaining method uses a Web-based help facilitate the public in

determining the suitability of land and mapping the locations of crops.

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