

CHAPTER 1. INTRODUCTION

1.1 Project Background

The development of technology in the current era of globalization is growing very rapidly and makes it easier to help humans in various fields of work. One of them is in agriculture. Indonesia's agricultural sector during the pandemic increased and was able to contribute 3% of Indonesia's total exports. This was stated at the IPB International Convention Center, Bogor in June 2021. Agriculture in Indonesia is very wide, almost all regions in Indonesia have fertile soil and sufficient rainfall throughout the year. Various types of plants are planted well by the farmers, one of which is the mango plants.

Mango is one of the tropical and sub-tropical fruit that is famous throughout the world because of its delicious and fresh taste. Mango fruit contains many vitamins. One of them is vitamin C. Mango is one type of fruit whose production is quite high and is much liked by the public. With so many people growing mangoes, but the lack of mastery of cultivation techniques and knowledge of pests and diseases, mango production is less than optimal in Indonesia. Most of the production and quality of fruit in Indonesia is currently still low due to the limited knowledge of farmers in maintaining their plants from pests and diseases. The identification process so far is still manual, it really depends on the limited number of plants pests and diseases observers (PHPT). The number of pests and diseases of mango plants is also quite large and makes PHPT quite difficult to identify pests and diseases that attack.

Pests and plant diseases are plant pest organisms (OPT). Animals are also included in the category of pests because they interfere with plants growth and eat them. Goats, caterpillars, grasshoppers are examples of animals that become pests of mango plants. Meanwhile, in mango diseases, it starts to attack from the plants to the fruit, examples of mango diseases include anthracnose and diplodia. From some pests and diseases there are similarities in symptoms. Symptoms of larvae on fruit are similar to those of fruit flies, fruit-cutting caterpillars and fruit borers. Therefore the similarity in symptoms makes it difficult to diagnose a diseases with

the use of technology, namely expert systems, the process of diagnosing pests and diseases becomes easier and faster.

An expert system (expert system) is a system that seeks to adopt human abilities or knowledge into computers, so that computers can work in solving a problem like an expert or someone who has expertise in a particular field, namely an expert who has special knowledge or abilities that unknown and owned by someone else then explain it to the user. One of the uses of the expert system is to diagnose pests and diseases in plants, one of which is the mango plants.

Mango plants are the majority of plants grown by the people of Indonesia, but over time many mango plants are attacked by pests and diseases due to the lack of public knowledge about mango plants care in its maintenance. So many fruits are not of good quality. Not only that, people who live in rural areas also have very little knowledge in using gadgets to find solutions to their problems, but use gadgets only to receive calls from each other. With the lack of community knowledge in maintaining mango plants, especially with conventional community cultivation, it causes low fruit productivity and quality, especially poor post-harvest handling in small and scattered business scales, poor accessibility, lack of infrastructure support, and limited capital. Public. On the other hand, competition in the freemarket era requires farmers or small communities to produce quality products, not only to meet export market demands but also to meet domestic market demands.

Based on the problems described above, it is necessary to conduct research to design and build an application capable of diagnosing pests and diseases of mango plants, namely D-Mango. This system is made based on Android so that people can access this application easily and anytime, because it is based offline, people who are not familiar with gadgets can now access this application with features that are designed to be easy to understand and use without using cellular data, so this application can used anytime and anywhere. The flow of this system makes the process of diagnosing pests and diseases and making a diagnosis conclusion that is calculated using the forward chaining method with the flow of the community (user) selecting various symptoms based on the facts experienced

by mango plants then the system will provide the results of a decision on what pests and diseases attack mango plants and how its control.

1.2 Problem Statement

Based on the description of the background of the problem above, it can be formulated:

- a. Difficulty to recognize the types of pests and diseases from the symptoms suffer, because there are many similarities in the symptoms from several pests and diseases for mango plants.
- b. Lack of information about types of pests and diseases suffered by mango plants.
- c. Lack of knowledge about pest and diseases prevention or control and mastery of cultural techniques.

1.3 Objectives

This project has the following objectives:

- a. To develop a diagnosis application android based to make it easier for users to identify the types of pests and diseases suffered by mango plants using forward chaining method.
- b. To provide information about the types of pests and diseases that attack mango plants.
- c. To provide information to users on how to control or prevent pests and diseases and their cultivation techniques.

1.4 Significance of The Project

- a. With the Android-based D-Mango application, it will be easier for users to find out what types of pests and diseases attack mango plants.
- b. With the Android-based D-mango application, it will be easier for users to find out information about the types of pests and diseases that attack mango plants.

- c. With the Android-based D-mango application, it will make it easier for users to provide proper prevention or control in the process of caring for mango plants without a plants expert.

1.5 Scope of The Project

1.5.1 Public (User) Scope

- a. The public (user) can know the definition of mango plants in general in the "About the Mango Plant" features.
- b. The public (user) can see and know the types of pests and their definitions in the "About the Mango Pest " features.
- c. The public (user) can see and find out the types of diseases and their definitions in the "About the Mango Diseases" features.
- d. The public (users) can use the "Diagnosis" features then choose various symptoms experienced by mango plants.
- e. The public (user) can see and find out the results of the diagnosis of pests and diseases that attack mango plants and how to control them, there is also a sound button to activate the sound of the diagnostic results so that the public (user) can hear the results of the diagnosis. And if users whose eyesight is not normal can find out the results of the diagnosis easily by just listening (no need to read).
- f. The public (users) can use the "Diagnosis History" features to see the results of the diagnoses that have been made.
- g. The public (user) can use the "Settings" features to choose the desired language (English or Indonesian) and about the D-Mango application.

1.5.2 System Scope

- a. The system displays the "About The Mango Plant" features.
- b. The system displays the "About The Mango Pest" features.
- c. The system displays the "About Diseases" features.
- d. The system displays the "Diagnosis" features.
- e. The system will display the Diagnosis Result in the form of the name of the pest and the name of the diseases that attacks the mango plants along with the

correct way of controlling it, and the system can display a diagnostic sound button when the community (user) activates the button.

- f. The system displays the “Diagnosis Histories” features.
- g. The system displays the “Setting” features.

1.6 Assumption and Limitation

1.6.1 Assumption

Applying expert knowledge in agriculture in a knowledge-based system so that information about pests and diseases on mango plants and how to control them can be realized through electronic media in the form of smartphones.

1.6.2 Limitation

Based on the formulation of the problem above, the limitations of the problem in making "Application of Diagnosis of Pest and Diseases on Mango Plants Using the Android-Based Forward Chaining Method" include: the application designed is an android-based application, so that in making this application using android studio. The method used in making this application is forward chaining with the mechanism of entering a set of known facts into working memory and then matching these facts with the IF part of the IF, THEN rules. There are also six features in this application, namely: About the Mango Plants, About the Mango Pest, About the Mango Diseases, Diagnosis, Diagnosis History, and Setting.