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Research Article

Geographic Information System Of Land Mapping Certification Of Rice Seeds In Bpsb, Subang Regency

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Abstract: This study aims to analyze the development of a geographic information system for mapping land certification for rice seeds at the Subang District's seed supervision and certification center based on (web gis). The geographic information system for mapping the land for certification of rice seeds at the BPSB (Seed Monitoring and Certification Agency) of Subang Regency is closely related to spatial data. The design or modeling of this system uses a modeling language, namely (Unified Modeling Language), and in its development using a method approach (Rational Unified Process) to determine the system structure's needs. Where the results of this analysis will be a system that will be developed, namely a geographic information system for mapping the land for certification of rice seeds at the Subang District's seed supervision and certification center is expected to simplify and improve performance at BPSB Subang Regency in managing land data so that it has more information value.

Keywords: Analysis, System Development, Geographical Information Systems

1. Introduction

Rice seeds are one of the determining factors determining the success of agricultural development because they have a vital role in deciding rice plants' growth and development activities [11][12].

Installation of PSBTPH Region 3 Subang is the UPTD BPSBTPH of West Java Province, which is tasked with carrying out guidance/quality control of seeds in Subang and Indramayu Districts, one of which is certified rice seeds [1].

Geographical Information System (GIS) is a system used to enter, store, recall, process, analyze and produce geo-referenced data or geospatial data, to support decision making in planning and management of land use, natural resources, environment, transportation, facilities, city, and other public services [2].

The Subang Regency Seed Supervision and Certification Center (BPSB) is one of the Technical Implementation Units (UPT) of the West Java Food Crops and Horticulture Service, which has the task of supervising and certifying seeds in the Subang and Indramayu Regencies. One part of the work unit at BPSB Subang Regency is the Plant Seed Supervisor (PBT), whose main task is to supervise and test the seeds of rice plants (in the field), which are in the process of applying for certification of plant seeds—referring to "PERMENPANRB No. 09 of 2010 concerning the Functional Position of Plant Seed Supervisor and Credit Score ".

In carrying out the task of supervising and testing rice seeds in the field with a comprehensive area coverage, namely between Subang and Indramayu Regencies, with this area coverage, it is necessary to map certified seed fields, using geographic information system technology (GIS), to assist officers in determining such as where and in what condition the land will be monitored and tested. Besides, when the land has been marked in the map system, PBT officers do not need to go to the producer place to re-ask the location of the land and the condition of the land (shifting/leased land), so that the travel period between BPSB - Producer - Test land is cut short with BPSB trips directly to the land to be tested. From the time cut, it is hoped that the number of grounds that have been tested as per the specified date will be higher than before.

In developing the above system, the Rational Unified Process (RUP) method approach defines, designs what the system needs.

2. Literature review

Certified Seed

When associated with the purpose of its use, seeds have two meanings, namely seeds and seeds. Source has a broader sense than origin. Seeds can be used for food, animal (animal) feed, or materials for further planting. Meanwhile, seeds are selected sources used for other planting to develop plants or produce new seeds.

The seed is defined as a plant seed that has undergone treatment to be used as a means of multiplying plants. Ergonomically, seeds are equated with seeds because they have the same function. But it's biologically different. The seed is used to refer to seeds that have germinated. In vegetative reproduction, seeds can be defined as plants that function as a means of reproduction, for example, tubers [3].

Certified seeds are seeds whose production process goes through the seed certification system stages and has met quality standards, both field and laboratory standards for each commodity and specified seed class. Seed certification officers supervise seed production from the UPTD Center for the Supervision and Certification of Food Crops and Horticulture Seeds of Subang regency.

Seed certification is the process of granting a plant seed certificate after going through field inspection and/or testing, supervising, and fulfilling all requirements and standards for development seeds.

Geographical Information System

Understanding Geographical Information Systems (GIS) is very diverse; this can be seen from the various definitions currently circulating on multiple literature sources. The purpose of this geographic information system will continue to develop and increase due to the geographic information system (GIS) technology that is widely used in various fields of scientific disciplines so that it proliferates. The following are definitions circulating on multiple sources of literature/experts:

1. Geographical Information System (GIS) is an information system used to enter, store, recall, process, analyze, and produce geo-referenced data or geospatial data, to support decision making in planning and managing land use, natural resources, the environment, transportation, city facilities, and other public services [4]
2. Geographical Information System (GIS) is a type of software that can be used to input, store, manipulate, display, and output geographic information and its attributes [5].
3. A geographical Information System (GIS) is a computer system used to manipulate geographic data. This system is implemented with computer hardware and software that functions for data acquisition and verification, data compilation, data storage, data change and updating, data management and exchange, data manipulation, data recall and presentation, and data analysis [6].

Information Systems

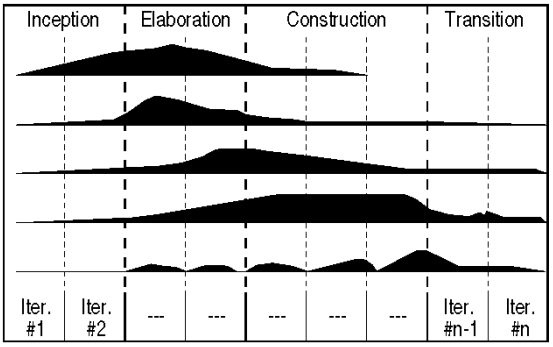
Information systems (IS) involve various information technologies (IT) such as computers, software, databases, communication systems, internet, mobile devices, and many more, to perform specific tasks, interact with and inform various actors in various social organizations. Therefore, of general interest to the IS field in all aspects of the development, deployment, implementation, use, and impact of IS in organizations and society. [7]

An information system is a combination of the word system and information. The system is a collection or set of elements, components, or variables organized, interact with each other, depend on each other, and are integrated [8]. This means that a process will be carried out by the sub-processor system components based on predetermined input to produce an output that has been predetermined at the beginning.

3. Method

Information Systems Development Methods

The stages of system development in the design of this information ordering system use the RUP (Rational Unified Process) methodology, which is an iterative software development approach, focusing on architecture (architecture-centric), more directed based on use cases (use case driven) [9]. The phases in the RUP methodology consist of:



The RUP methodology consists of Figure 1 Phase in the RUP.

The phases in the RUP (rational unified process) development model are:

1. Inception (Beginning)

This stage is rather than modeling the required business processes (business modeling) and defining the system's requirements to be created (conditions).

2. Elaboration (Expansion / Planning)

This stage is more focused on planning the system architecture. This stage can also detect whether the desired system structure can be created or not. Detect descriptions that may appear from the created architecture. This stage is more on the set of analysis and system design and the implementation of a system that focuses on the system prototype (prototype).

3. Construction

This stage focuses on the development of system components and features. This stage is more on the implementation and testing of the system, which focuses on the software's performance in the program code. This stage produces software products requiring the Initial Operational Capability Milestone or the initial operational capability limits.

4. Transition (Transition)

5. the user can understand steps in the deployment or installation of the central system. This stage produces a software product that becomes a requirement of the Initial Operational Capability Milestone or initial operational capability limits. Activities at this stage include user training, maintenance, and testing whether it has met user expectations.

Software products also correspond to the needs defined at the inception stage. If all the objective criteria are met, it is deemed to have met the Product Release Milestone (limit/product launch milestone), and software development has been completed.

4. Result and discussion

Functional Needs Development of Geographical Information System Mapping of Rice Plant Seed C ertification at BPSB Subang Regency

Functional Requirements are the core requirements of the system where the system to be built must meet the needs determined from the results of observations and identification of a problem raised the topic.

Table 3.2 Functional Requirements

No SRS	Information
Pbt - ProduCer	
SRS-SIG-100	The system can process logins
Pbt	
SRS-SIG-210	The system can manage gallery data
SRS-SIG-220	The system can collect producer data
SRS-SIG-230	The system can collect land data
SRS-SIG-240	The system is capable of displaying routes
SRS-SIG-300	The system can display the map
Producer	
SRS-SIG-230	The system can collect land data

Usecase Diagram

From the results of the functional requirements described above, it can be illustrated in a use case diagram that aims to briefly explain who uses the system and what it can do [10]. This follows a use case diagram in the development of an information system for lab test results.

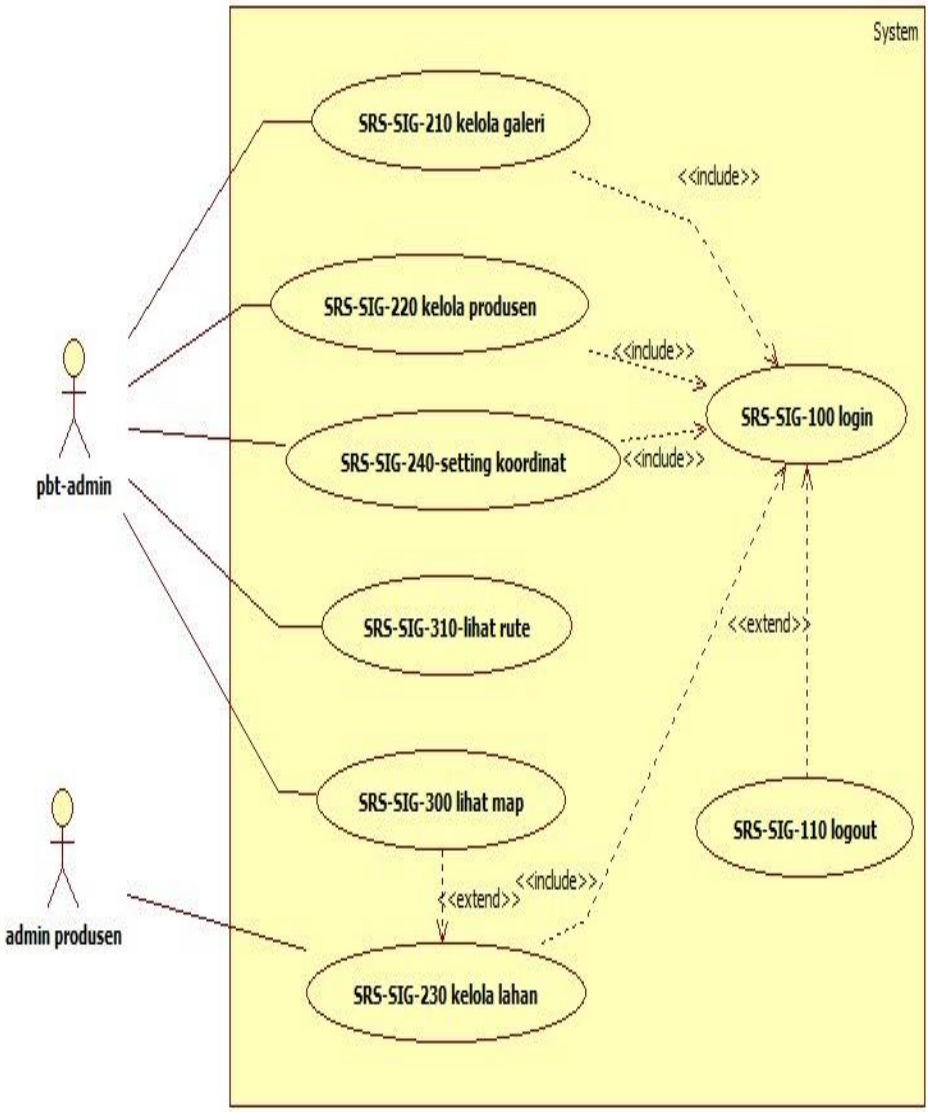


Figure 2 Use case diagram of Geographical Information System for Land Mapping

Activity Diagram

Activity diagrams are made based on one or more use case information system results of lab tests. They are a design of activity flow or workflow in an information system of lab test results that will be run [10]. The following is the activity diagram for land management in the geographic information system for land mapping.

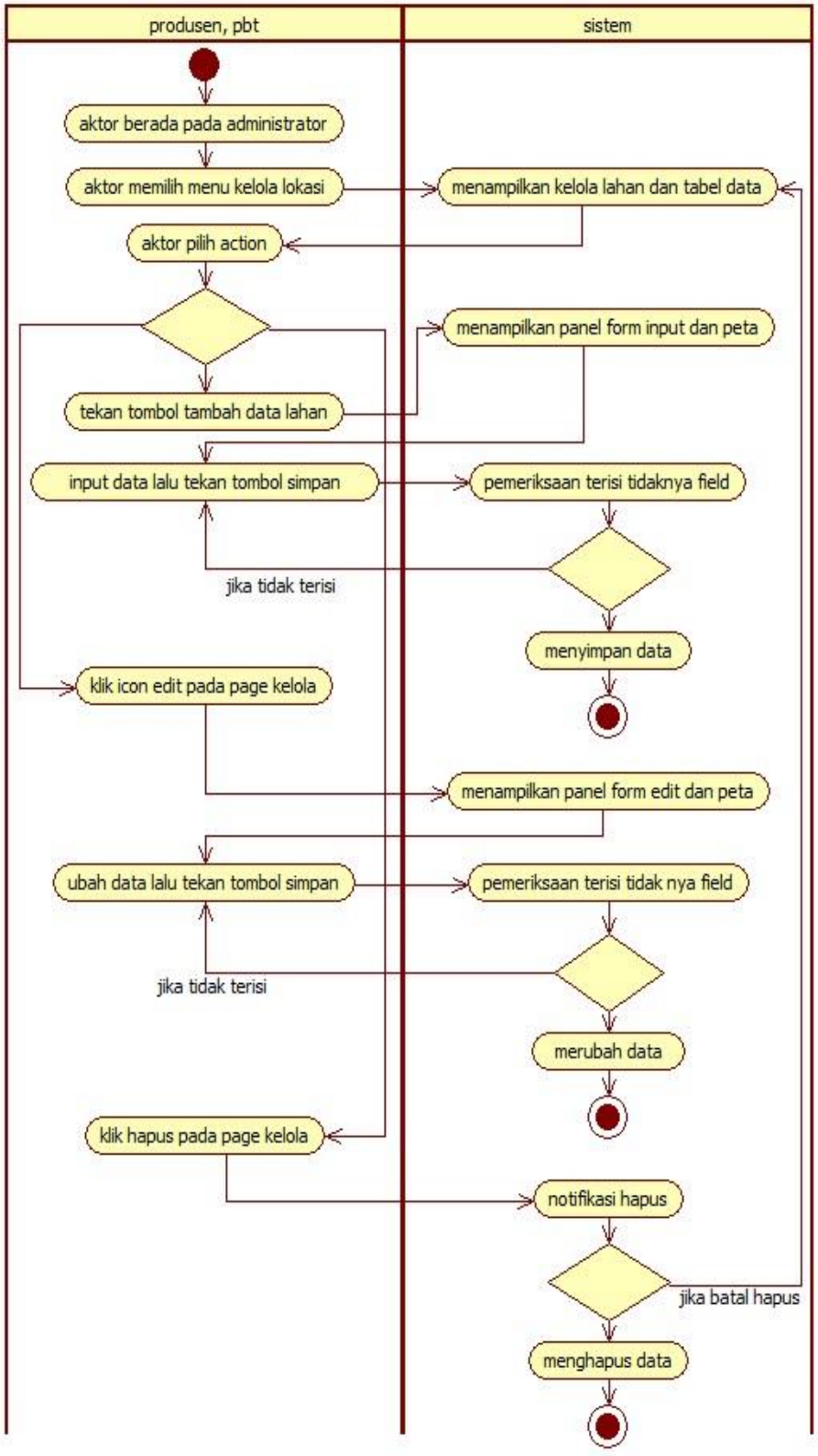


Figure 3 Activity diagram of Land Management

Class Diagram

Class diagrams are made to explain the structure of the information system laboratory test results in terms of defining the classes to be made [10].

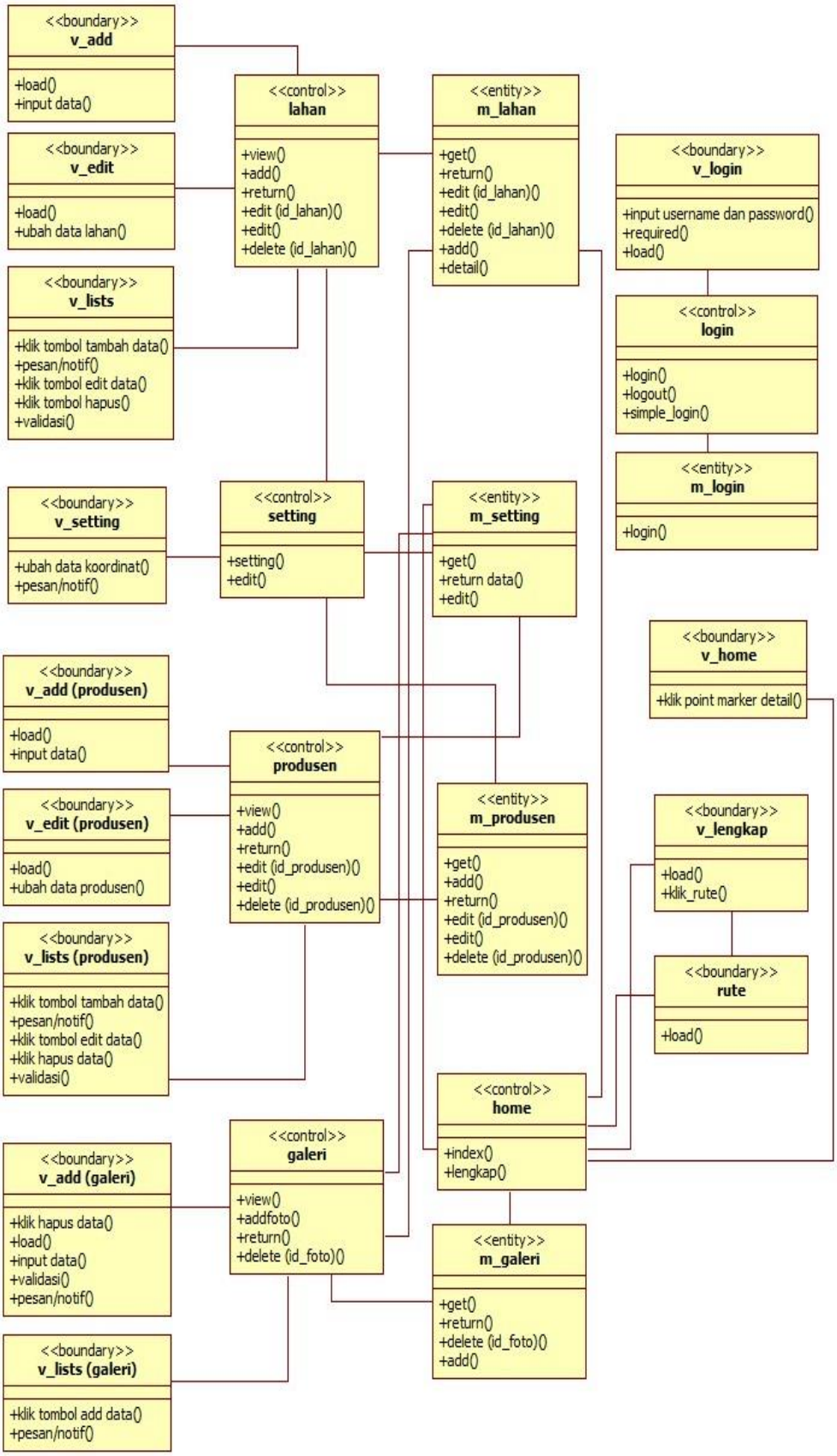


Figure 4. Class diagram of a Geographical Information System for Land Mapping

Sequence Diagram

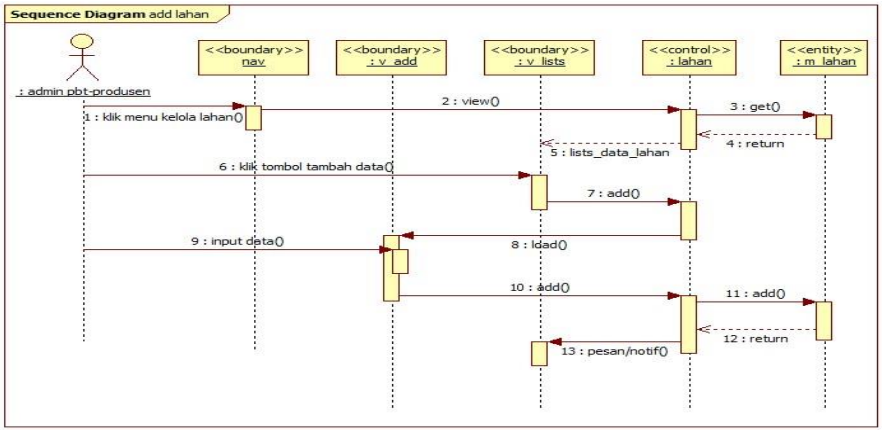


Figure 5. Sequence Diagram of Land Management

System Implementation

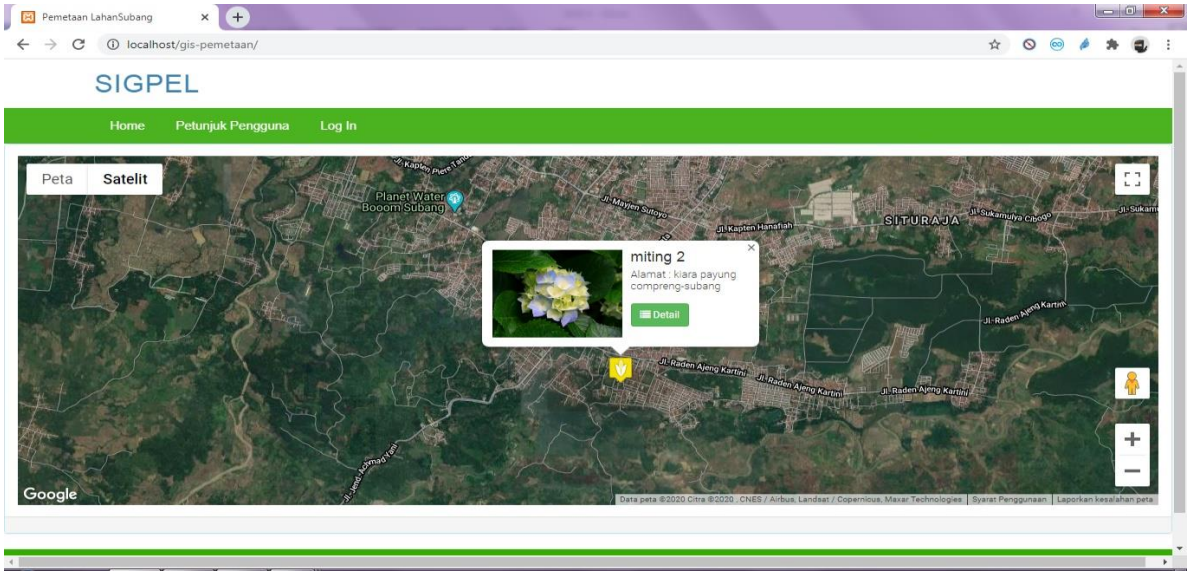


Figure 6. Implementation of the home interface

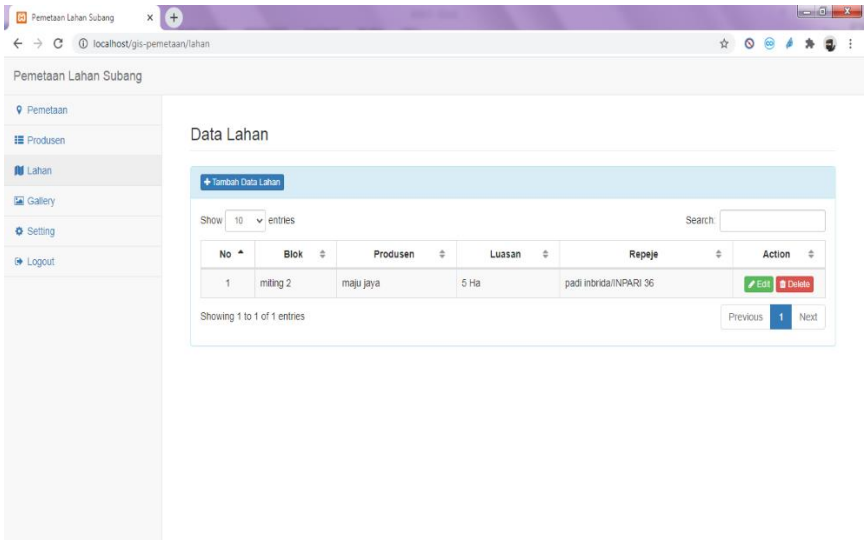


Figure 7 Implementation of the Land Management interface

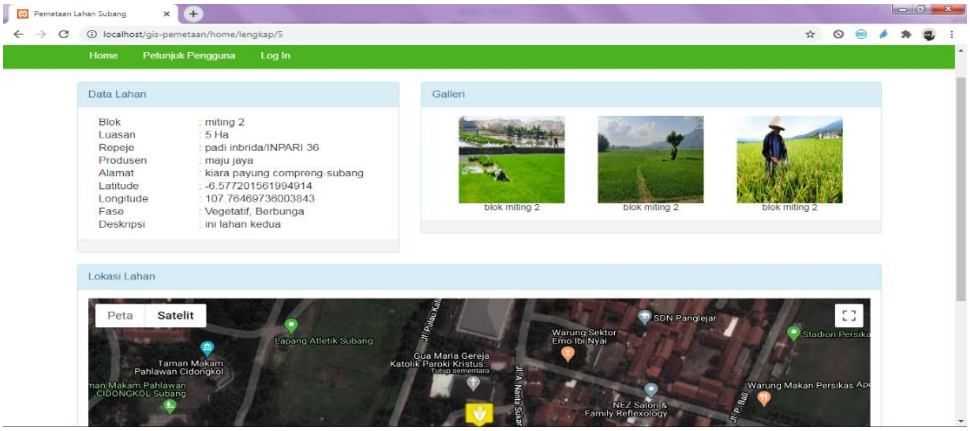


Figure 8 Implementation of Detailed Data Interface

5. Conclusion

Based on the analysis results, system design, and system implementation, which has been described in the previous chapter. So some conclusions can be drawn from the geographic information system for mapping the land for certification of rice seeds at BPSB of Subang Regency that has been built as follows:

1. The establishment of a geographic information system for mapping land certification for rice plants at the BPSB of Subang Regency can display the distribution of certified rice fields along with the information that is spread across the working area of Subang Regency.
2. The system built can help plant seed supervisors determine which points of land are being tested.
3. This system can display the route from the point (default), namely BPSB, Subang Regency, to the coordinates or point of the field being tested. This route can calculate the travel distance and the available paths to be traversed with the appearance of this route.

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