GENERAL SIR JOHN KOTELAWALA DEFENCE UNIVERSITY

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY/ INFORMATION SYSTEMS

Testing and Validation Report

Group - 04

Industry-Based Software Engineering Project

Contents

1. Introduction

In response to the pressing needs of the Sooriyawawa/Meegahajandura Agriculture Service Center, our software engineering group embarked on a transformative journey, culminating in the creation of an innovative Agriculture Information Management System (AIMS). Rooted in a deep understanding of the challenges faced by the center, our project aimed to revolutionize their office operations, ushering in a new era of efficiency and precision.

We carefully investigated the previous system through a requirement-gathering phase, discovering its flaws, inefficiencies, and vulnerabilities. The first-hand encounters we had during the visit to the center highlighted the urgent requirement for a cutting-edge solution. It quickly became clear that the only practical solution to these problems was a customized web application.

Through an effortless interface, our solution gives users more power. From development officers to agriculture instructors, everyone working in the agricultural environment is provided with effective tools. Paddy farmers' information may be easily managed by development officers, resulting in a complete database. Importantly, the system's strong filtering features enable quick access to certain farmer information, optimizing decision-making procedures.

Through the system, agriculture instructors play an important part in sharing the most recent technology information, news, and notifications. The agricultural sector benefits from continuous learning and innovation because of this active communication of information. Additionally, our system is a pioneer in precision farming since it effectively calculates the optimum fertilizer dosage needed for a given quantity of land, increasing agricultural productivity while reducing waste.

Our initiative is supported by an updated technology infrastructure. We carefully developed a user-centric experience using PHP, HTML, CSS, JavaScript, and MySQL. These developments enable real-time data analysis and seamless communication, resulting in a responsive and understandable user interface.

This Agriculture Information Management System is essentially a monument to how technology can change the world. We have reduced office procedures and promoted a culture of wise decision-making and agricultural excellence by attending to the requirements of the Sooriyawawa /Meegahajandura Agriculture Service Centre. Our project provides a way for a sustainable and appropriate agricultural community by combining technical proficiency with a deep awareness of agricultural details.

2. Objectives of Testing

To assure the reliability, dependability, and user-friendliness of the Agriculture Information Management System, our strict validation procedure was carefully planned. This extensive testing was influenced by the following goals. By aligning our testing efforts with these objectives, we aimed to guarantee the Agriculture Information Management System's reliability, functionality, and user satisfaction, ensuring it meets the requirements and expectations of its users.

1. Functionality Testing:

Objective:

To verify that all system features, including user registration/authentication, data entry/editing, filtering, knowledge sharing, fertilizer calculation, and summary generation, are functioning as intended.

Method:

Systematically test each feature to confirm that it behaves as specified in the requirements. Validate user inputs, system responses, and data accuracy.

2. Data Accuracy Testing:

Objective:

To ensure that the data entered into the system is accurately processed and displayed and that the fertilizer calculations are precise.

Method:

Input various data sets into the system and compare the output with expected results. Validate data integrity during data entry, editing, and filtering operations.

3. User Experience Testing:

Objective:

To evaluate the user interface and experience, ensuring it is intuitive and user-friendly for all user roles, including development officers, agriculture instructors, and senior development officers.

Method:

Conduct usability testing with representative users to gather feedback on the system's design, navigation, and overall user experience. Iterate design based on user input.

4. Security Testing:

Objective:
To validate the system's security measures, including user authentication and data protection, to prevent unauthorized access and ensure data confidentiality.

Method:
Conduct security assessments, penetration testing, and vulnerability scans to identify and address potential security vulnerabilities. Verify encryption protocols and access controls.

5. Performance Testing:

Objective:

To assess the system's performance under various conditions, ensuring responsiveness and efficiency even during peak usage times.

Method:

Conduct load testing to simulate concurrent user interactions and monitor system response times. Identify bottlenecks and optimize system resources for optimal performance.

6. Compatibility Testing:

Objective:

To test the system on different devices and web browsers to ensure compatibility and consistent user experience across platforms.

Method:

Test the system on various devices (desktops, tablets, and smartphones) and browsers (Chrome, Firefox, Safari, etc.). Ensure proper rendering, functionality, and responsiveness.

7. Validation of Notifications and Updates:

Objective:

To verify that agriculture instructors can successfully share knowledge, news, and notices and that users receive these notifications promptly.

Method:

Send test notifications and assess delivery times and accuracy. Confirm that notifications contain the correct information and that users can access shared knowledge and news.

3. Test Plan & Testing Strategy

A strong testing strategy was essential to the systematic development process of the Agriculture Information Management System to guarantee its dependability and efficiency. We used a complex testing strategy that included thorough internal members and essential input from our stakeholders, including the Sooriyawawa /Meegahajandura Agriculture Service Centre and its staff.

1. Unit Testing

   Internally, we started our testing approach with unit testing, in which distinct parts and modules were examined separately. We were able to validate the operation of every component in the system due to this comprehensive study at the micro-level. We made sure each module completed its intended tasks completely and successfully during this process.

2. Integration Testing

   Integration Testing was essential looking forward. To ensure proper interactions, integrated components were tested simultaneously. We examined the smooth collaboration between several modules to make sure that data moved between them without any interruptions. We ensured seamless connectivity between various functionalities by spotting and fixing integration problems early in the development process.

3. System Testing

   A critical stage was System Testing, during which our entire Agriculture Information Management System became accurate testing. We evaluated the system's end-to-end performance while looking at user interactions, data processing, and system responses. The system's reliability and dependability under different conditions were ensured through the execution of rigorous testing scenarios that covered everything from regular user behaviors to terrible scenarios.

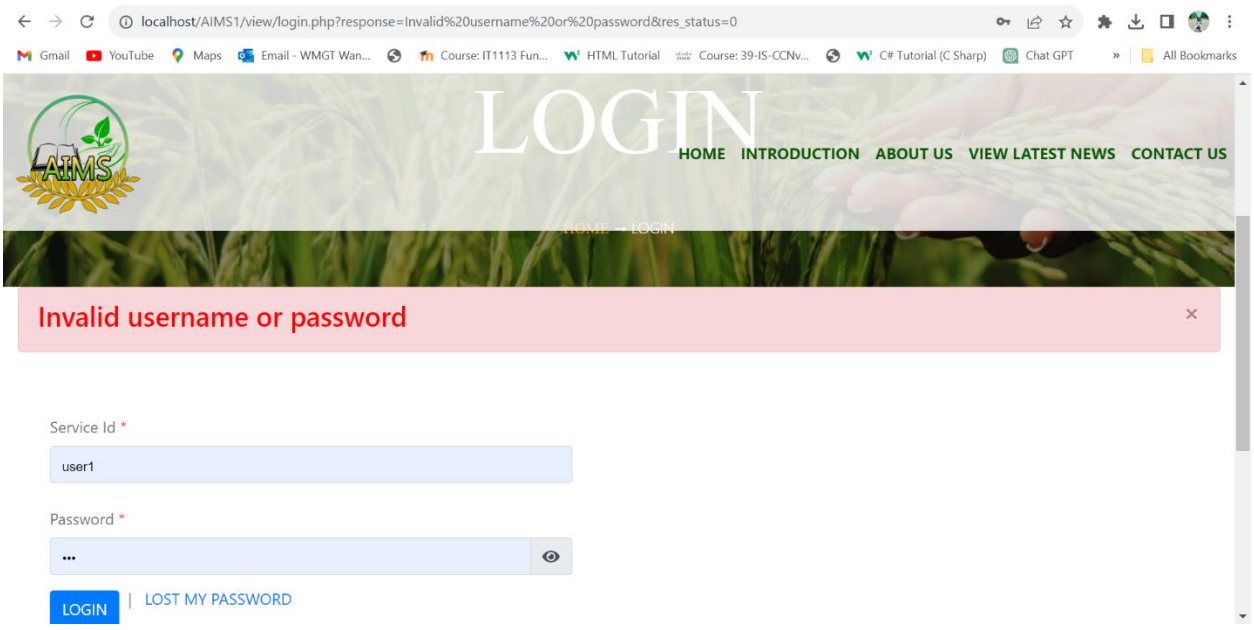
4. Acceptance Testing

   We trusted our system with the stakeholders, including the dedicated employees at the Sooriyawawa /Meegahajandura Agriculture Service Centre, after internal testing was finished. The end users' own acceptance testing, which helped the technology be validated against real-world scenarios, was important. Their practical knowledge allowed them to gain valuable information, ensuring that the system satisfied their needs and expectations. We improved the system's usability and addressed specific user demands by working together to adjust the system.

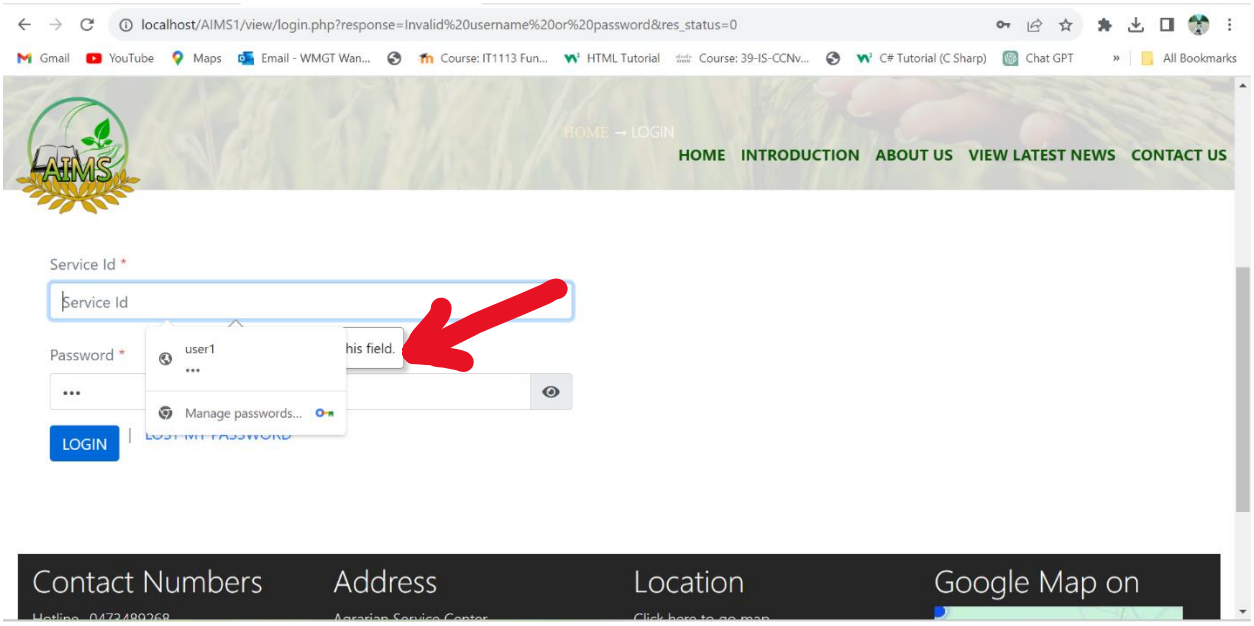
4. Test Cases

User Registration Page

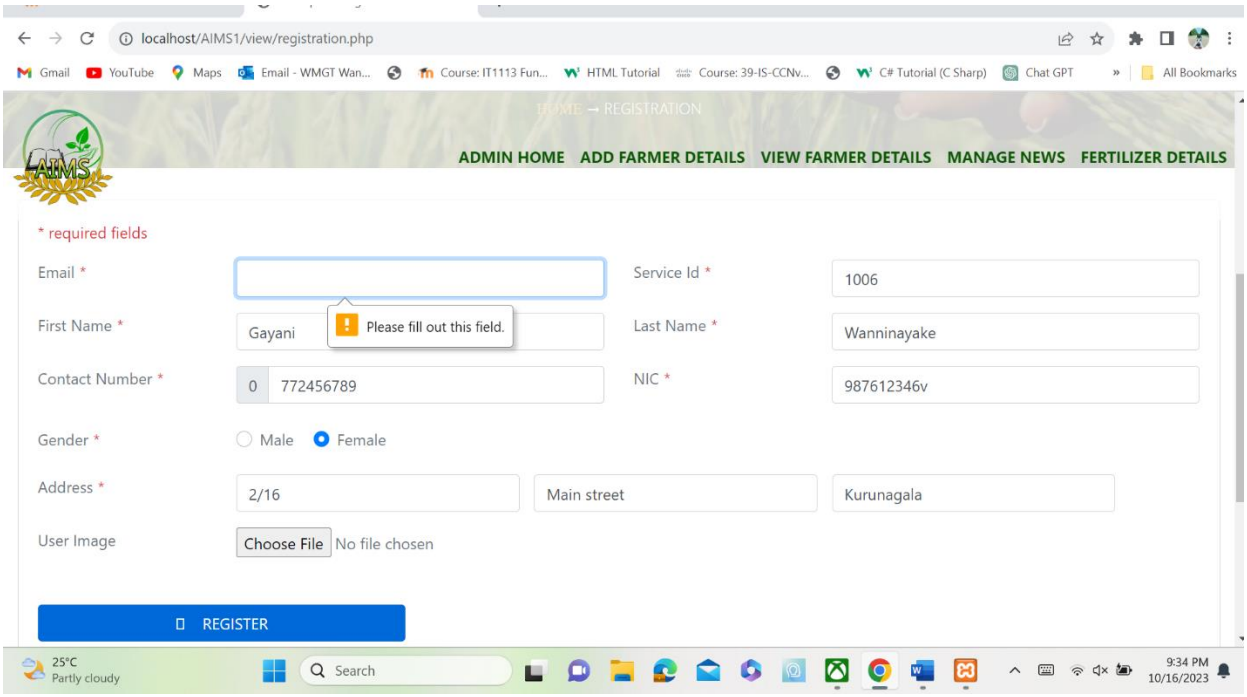
Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
01	The first attempt of incorrect password	Should be a registered person	1. Go to the user login form. 2. Enter the username. 3. Enter the password. 4. Click on the login button.	Username – Gayani Password- 1234	The error message, “Invalid username or password”	“Invalid username or password”	True



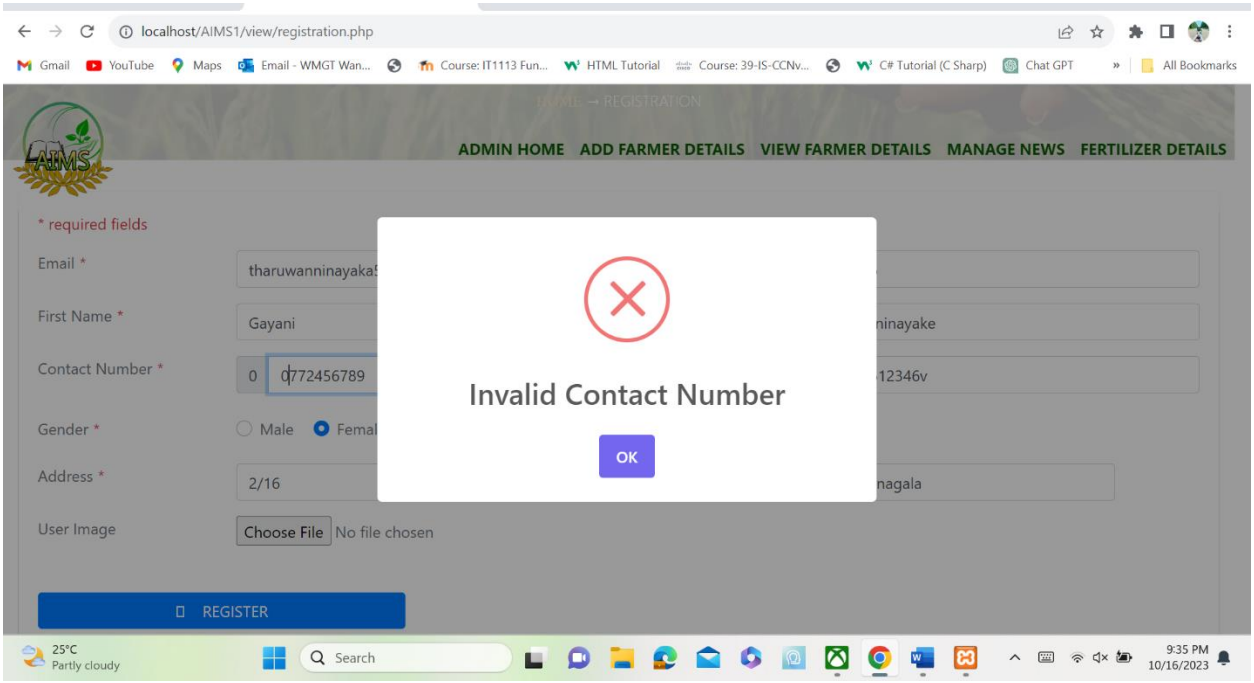
Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
02	Attempt with a blank username	Should be a registered user	1. Go to the user login form. 2. Skip filling username 3. Enter the password. 4. Click on the login button.	Username – (blank) Password 1234	The error message, “Fill this field”	“Fill this field”	True



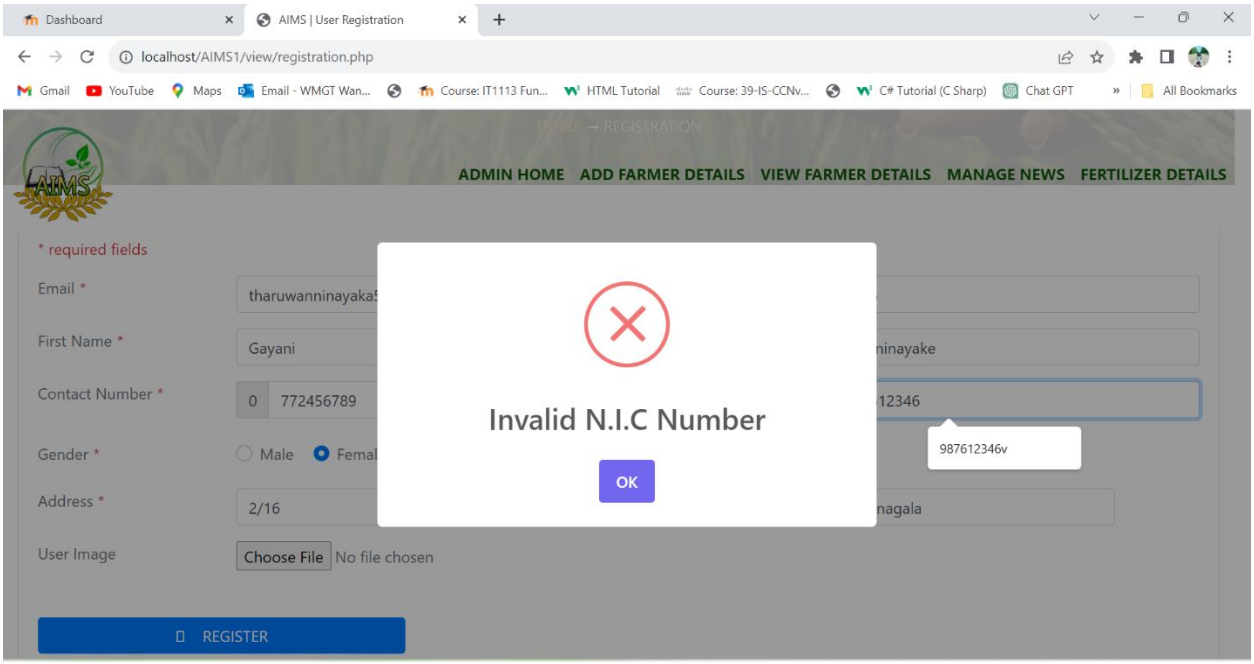
Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
03	Register a user with a blank input field	Should be an unregistered user	1. Go to the user registration form. 2. Fill the input field. 3. Skips 1-2 field. 4. Click on the register button.	Name- Gayani Wanninayake NIC – 987612346v With other required things	The error message “Please fill out this field”	“Please fill out this field”	True



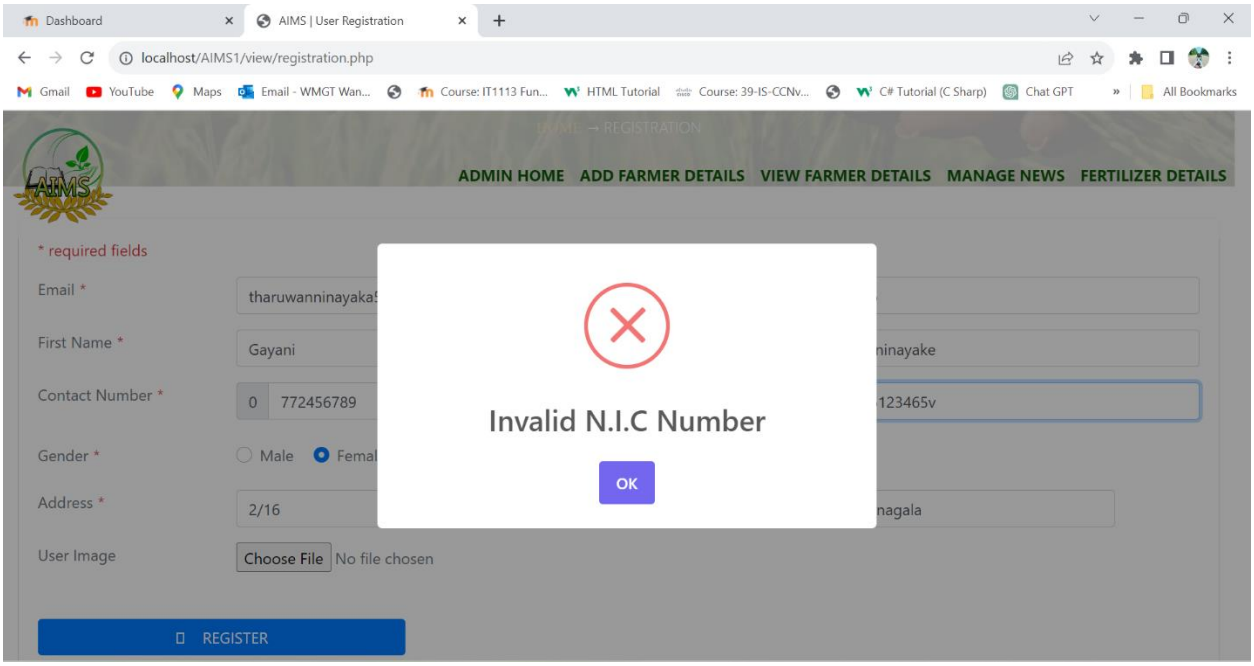
Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
04	When registering a user add 0 to start the contact number	Should be a nonregistered user	1. Go to the user registration form. 2. Fill the input field. 3. When adding a contact number start with '0.' 4. Click on the register button.	Fill all the fields with proper inputs. Contact no:0772456798	The error message "Invalid Contact Number"	"Invalid Contact Number"	True



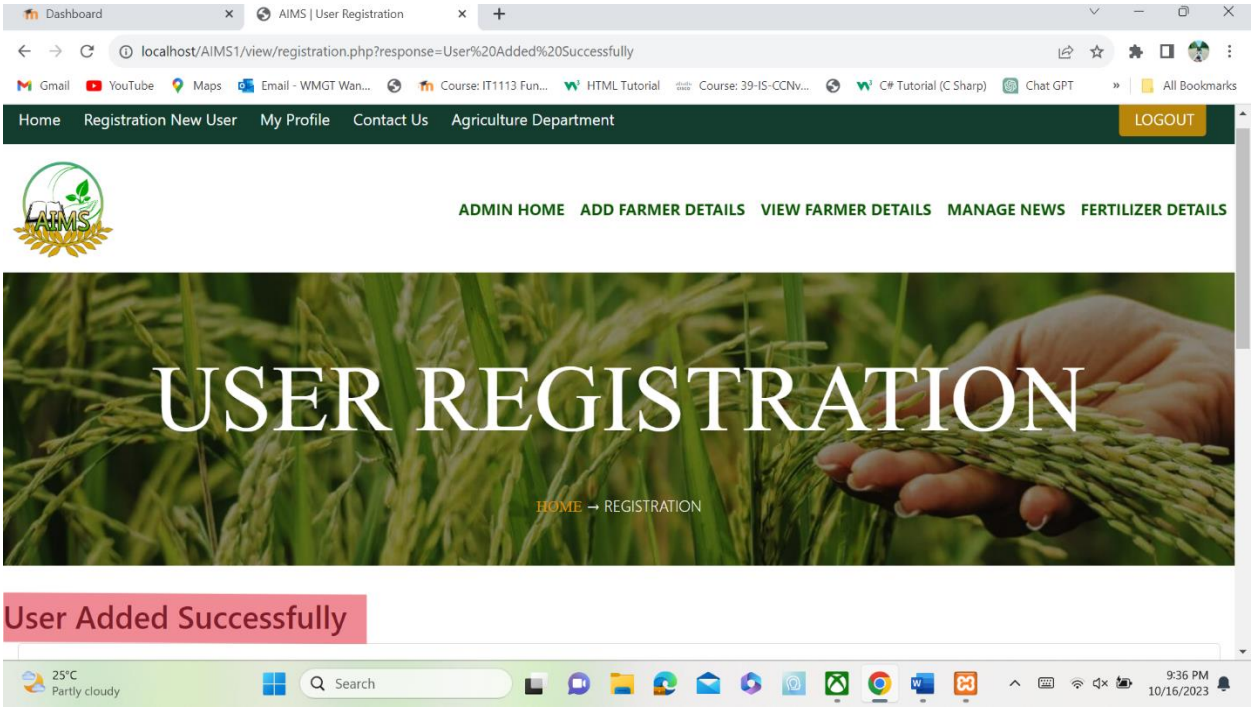
Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
05	When registering a user add a NIC number without V/v	Should be an unregistered user	1. Go to the user registration form. 2. Fill the input field. 3. Add NIC number without V/v. 4. Click on the register button.	Fill all the fields with proper inputs. NIC - 987612346	The error messages “Invalid N.I.C. Number”	“Invalid N.I.C. Number”	True



Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
06	When registering a user add a NIC number with ten numbers & V/v	Should be an unregistered user	1. Go to the user registration form. 2. Add NIC number with ten numbers & V/v, Click the register button	Fill all the fields with proper inputs. NIC – 9876123465v	The error messages “Invalid N.I.C. Number”	“Invalid N.I.C. Number”	True

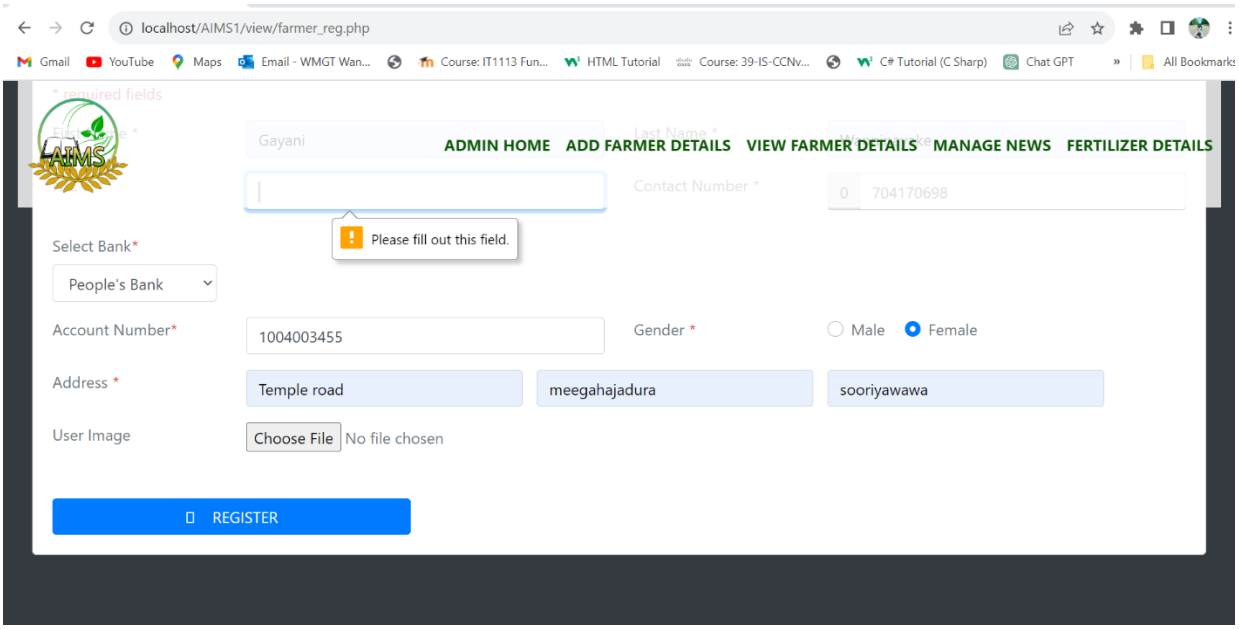


Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
07	When registering a user adding all the proper details	Should be an unregistered user	1. Go to the user registration form. 2. Fill all the input fields properly	Fill all the fields with proper inputs. Name – Gayani Wanninayake NIC – 996480852v Like vise	The message “User Added Successfully”	“User Added Successfully”	True

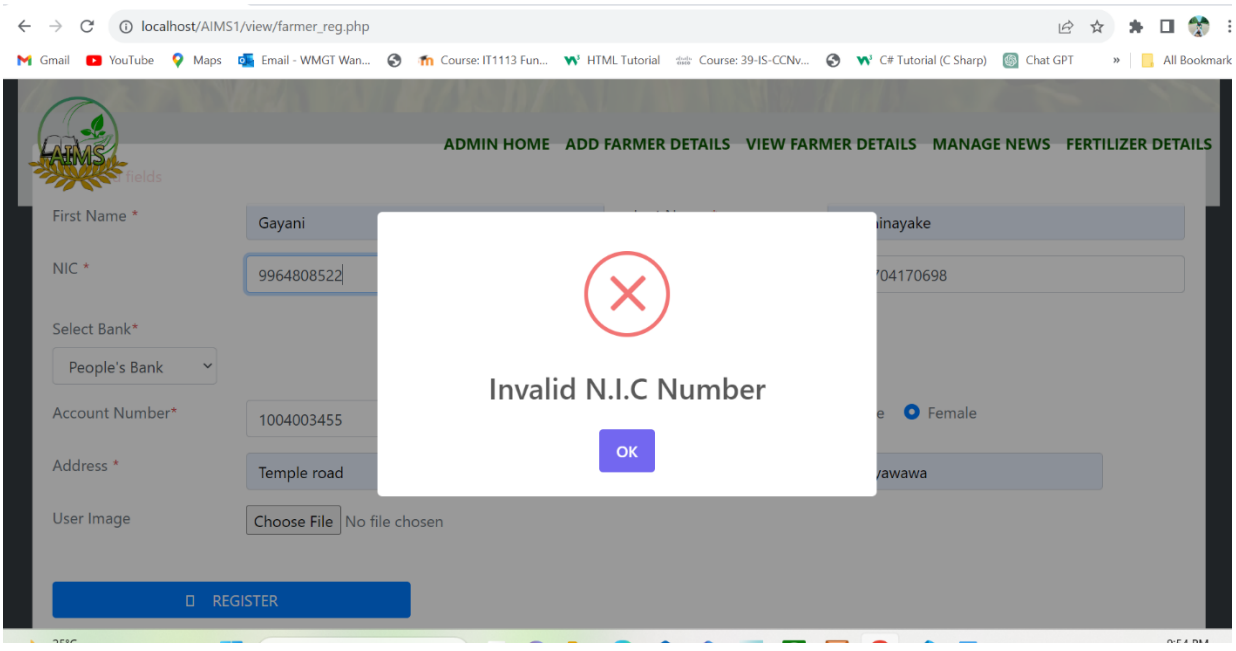


Farmer Registration Page

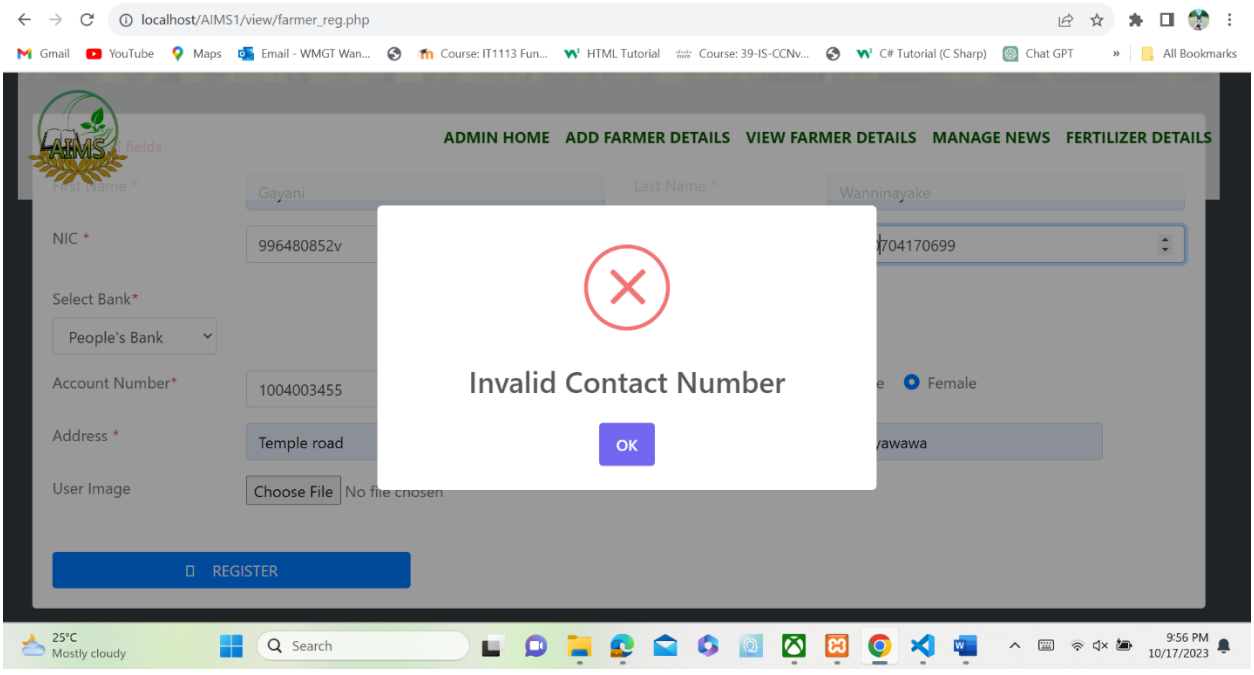
Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
08	When registering a farmer, fill in all the input fields and skip one or two.	The user should log in to the system's Farmer Registration Form	1. Go to the farmer registration form. 2. Fill all the input fields and skip one or two	Fill all the fields with proper inputs. Name- Gayani Gender- female	The error messages "Please fill out this field"	"Please fill out this field"	True



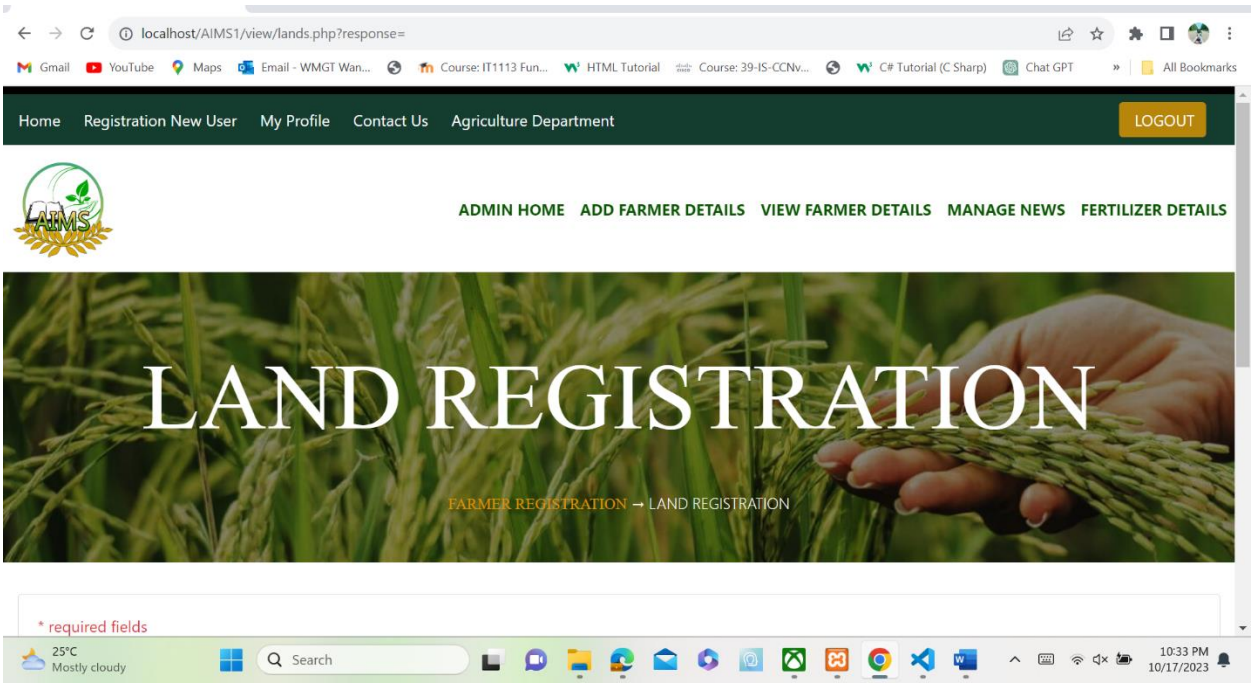
Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
09	When registering a farmer, enter the NIC number with 10 numbers. (without V/v)	The user should log in to the system's Farmer Registration Form	1. Go to the farmer registration form. 2. Fill all the input fields. 3. Enter the NIC number with 10 numbers (without V/v)	Fill all the fields with proper inputs. Name-Gayani Gender-female NIC-9964808522	The error messages "Invalid N.I.C Number"	"Invalid N.I.C Number"	True



Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
10	When registering a farmer, enter the 0 to start the contact number.	The user should log in to the system's Farmer Registration Form	1. Go to the farmer registration form. 2. Fill all the input fields. 3. Enter the contact number with 10 numbers (starting from 0)	Fill all the fields with proper inputs. Name-Gayani Gender-female NIC-9964808522 Contact NO-0704170699	The error messages "Invalid Contact Number"	"Invalid Contact Number"	True

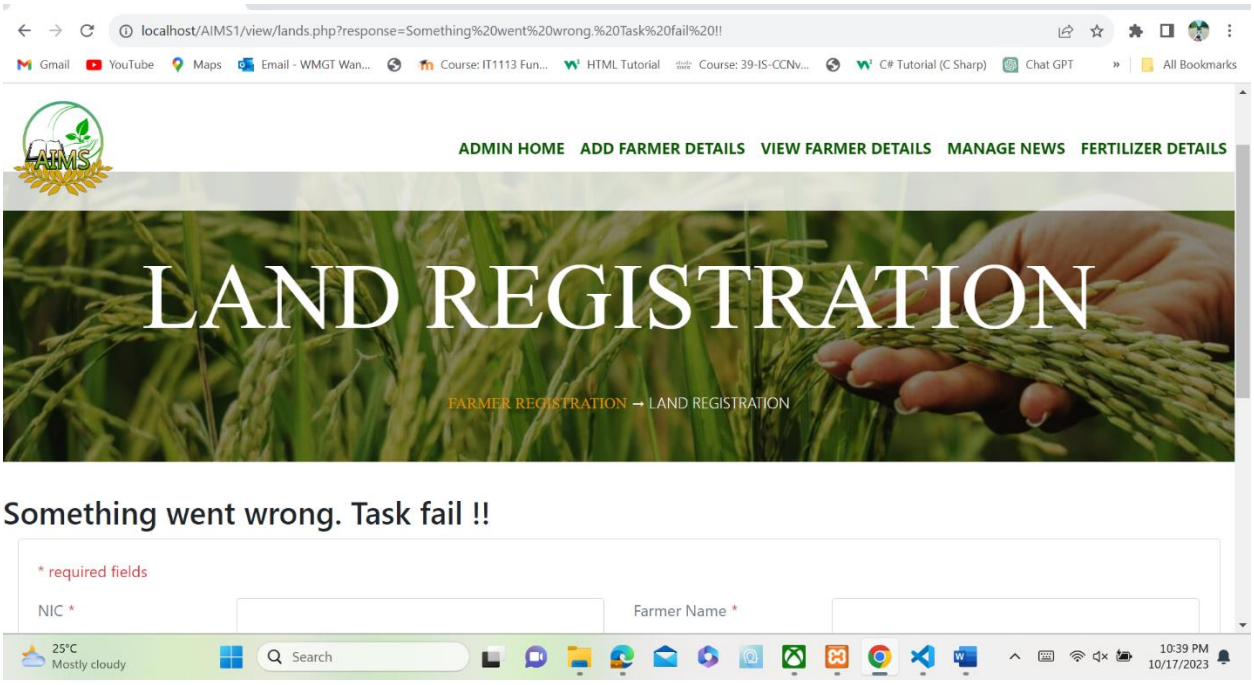


Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
11	When registering a farmer, add all the proper details to the input fields.	The user should log in to the system's Farmer Registration Form	1. Go to the farmer registration form. 2. Fill all the input fields.	Fill all the fields with proper inputs. Name-Gayani Gender-female NIC-9964808522 Contact NO-0704170699	The message "Farmer Registered Successfully"	Show the Land Registration Form	False

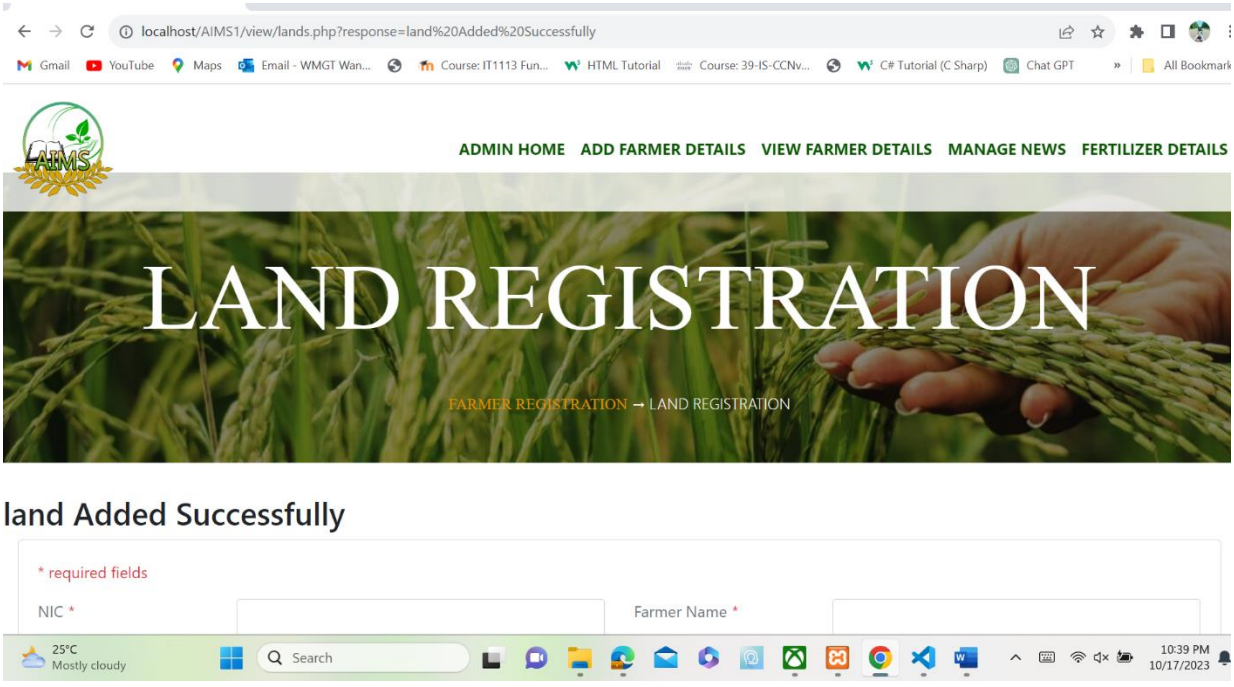


Land Registration Page

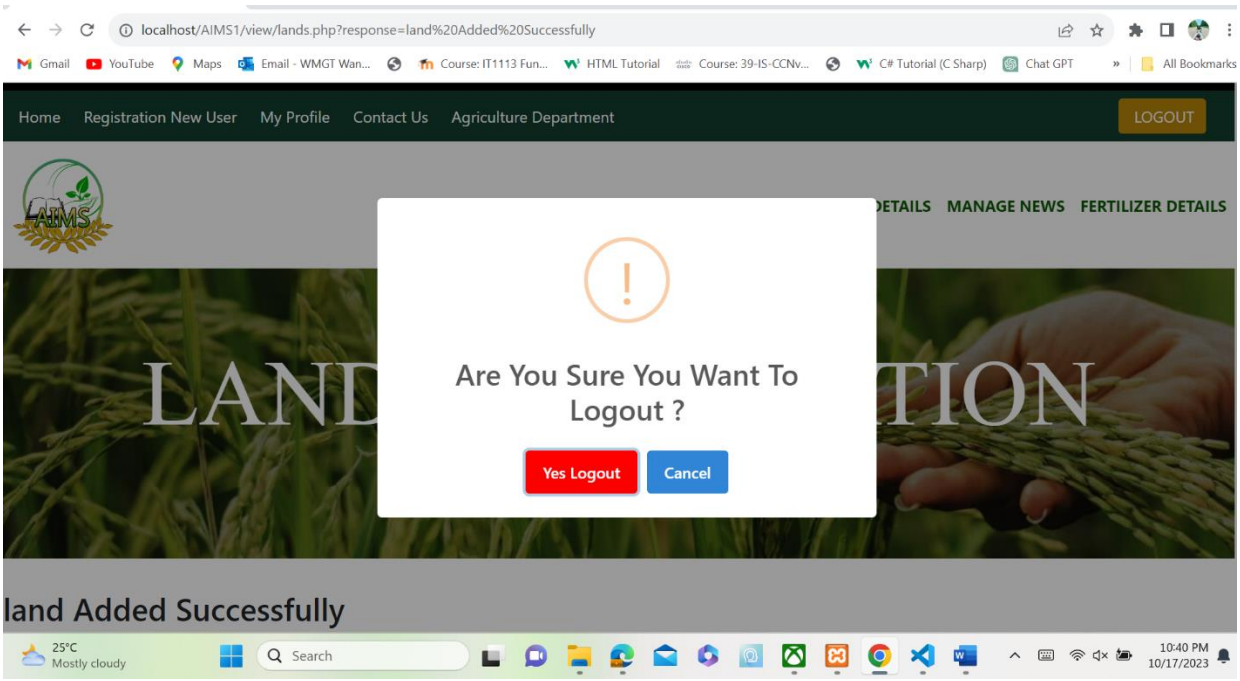
Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
12	When registering a land, add an existing land number to the input field.	The user should register the farmer into the system.	1. Go to the Land registration form. 2. Fill all the input fields with the existing land number	Fill all the fields with proper inputs. Name-Gayani NIC-996480852v Land No-12	The message “Something went wrong. Task Fail !!”	“Something went wrong. Task Fail !!”	True



Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
13	When registering a land, add the unique land number to the input field.	The user should register the farmer into the system.	1. Go to the Land registration form. 2. Fill all the input fields with the unique land number.	Fill all the fields with proper inputs. Name-Gayani NIC-996480852v Land No-65	The message “Land added Successfully. !!”	“Land added Successfully. !!”	True

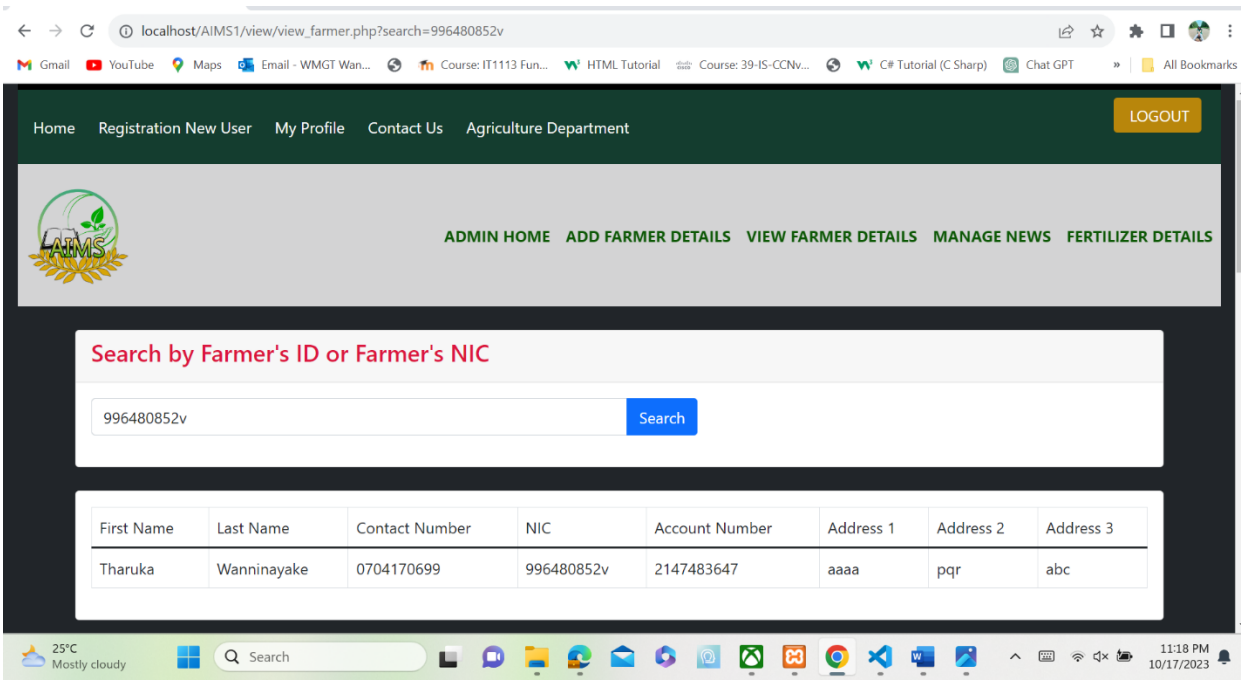


Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
14	When after registering a land, click the LOGOUT Button.	The user should log into the system	1. Go to the Land registration form. 2. Click the LOGOUT button.	Click on the LOGOUT button.	The message “Are you sure? You want to log out? ”	The message “Are you sure? You want to log out? ”	True



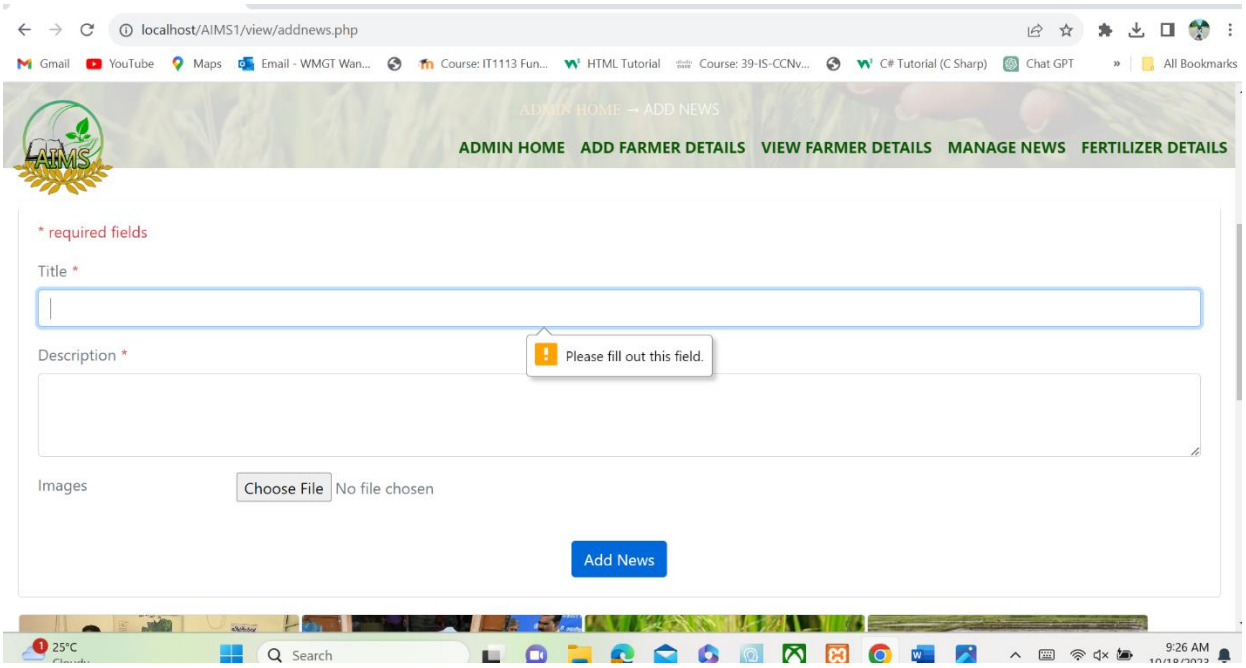
View Farmer Details Page

Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
15	When searching farmer details using the farmer NIC number.	The user should log into the View Farmer Details page.	1. Go to the View Farmer Details form. 2. Enter the farmer NIC who wants to search. 3. Click the search button.	NIC-996480852v	Show that Farmer details.	Show that farmer's details in one line.	True

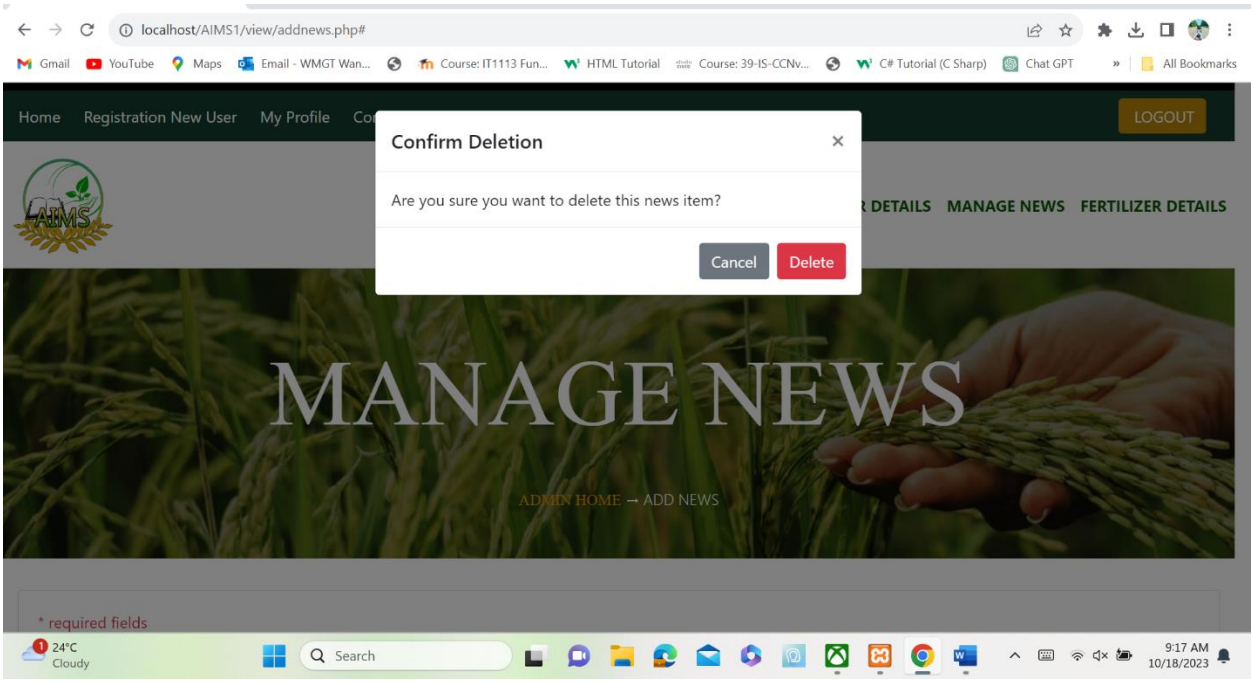


Manage News Page

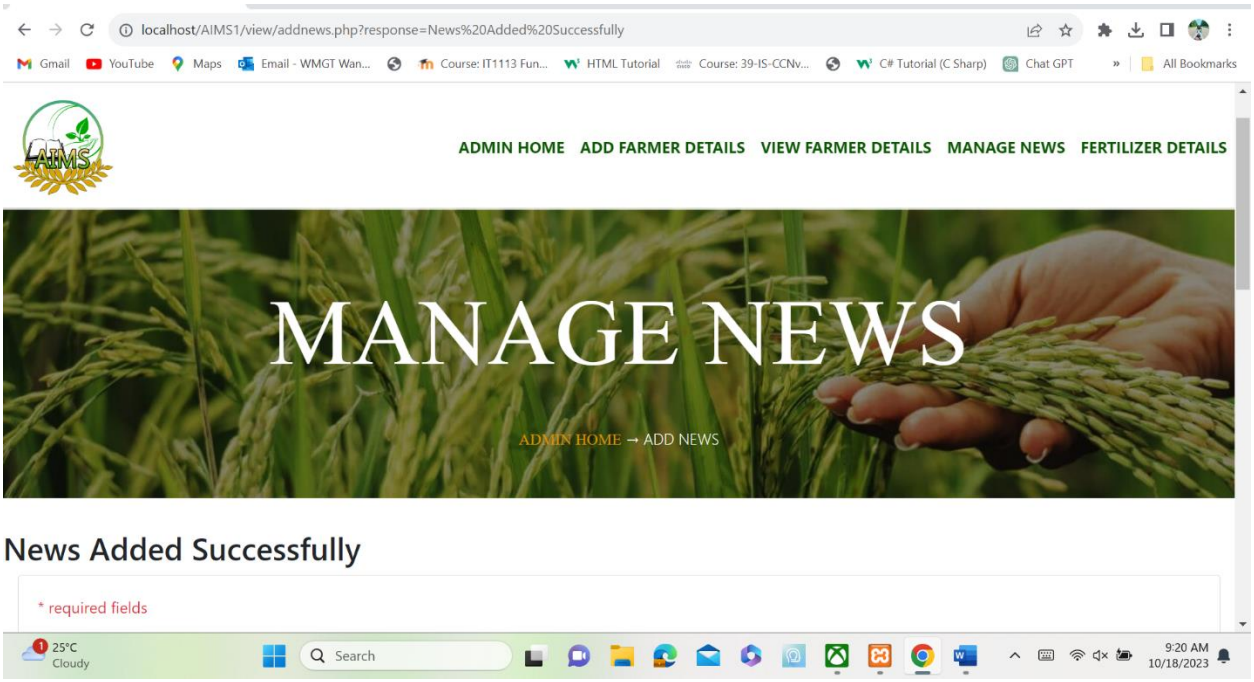
Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
16	When adding new news, Skip all the input fields and click the Add button.	The user should log into the Manage News page as an Agriculture instructor.	1. Go to the Manage News form. 2. Click the ADD button without filling in any input fields.	A button clicks on the ADD button.	The message “Please fill out this field.”	“Please fill out this field.”	True



Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
17	When deleting an existing news, Select the news and click the Delete button.	The user should log into the Manage News page as an Agriculture instructor.	1. Go to the Manage News form. 2. Select the news that should be deleted. 3. Click the Delete button.	A button clicks on the Delete button.	The message "Are you sure you want to delete this news item?"	"Are you sure you want to delete this news item?"	True

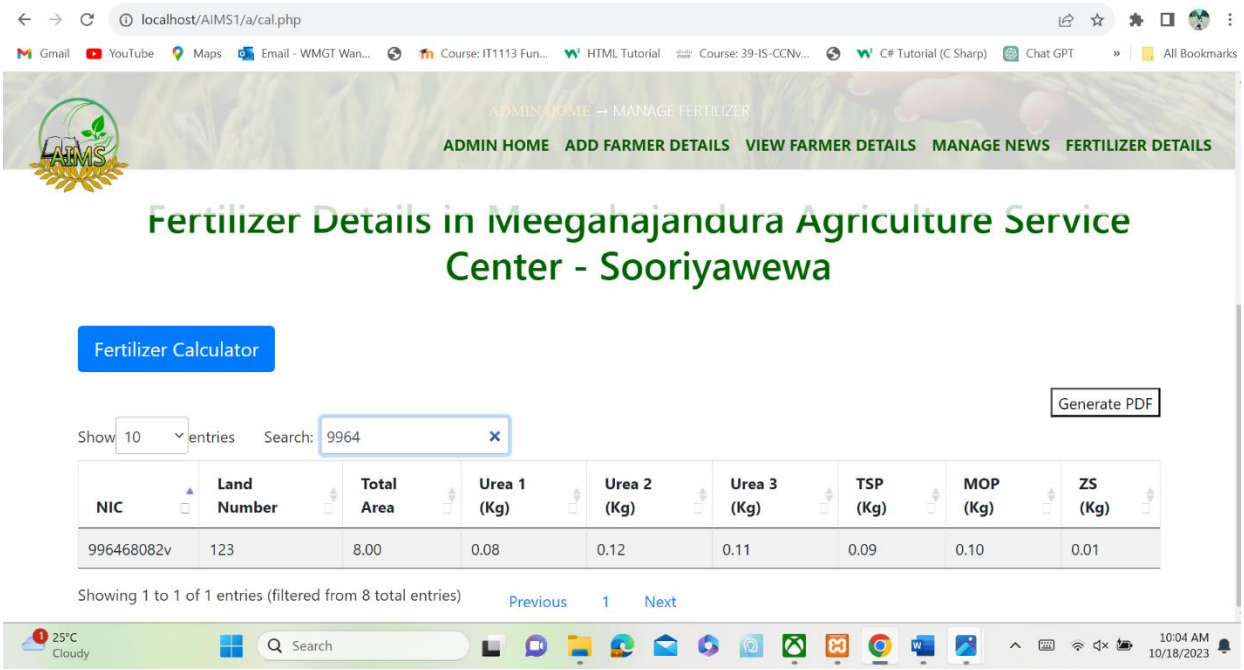


Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
18	When adding new news, Fill out all the input fields and click on the ADD button.	The user should log into the Manage News page as an Agriculture instructor.	1. Go to the Manage News form. 2. Fill all the input fields. 3. Select the image related to the news. 4. Click the ADD button.	Title- සූරියවඩ/මීගහජන්දුර ගෙඞිජන සේවා මද්‍යස්ථානයේ දත්ත කලමනාකරනයට නව වෙබ් පිටුවක් ස්තාපිත කෙරේ.	The message “News Added Successfully”	The message “News Added Successfully”	True

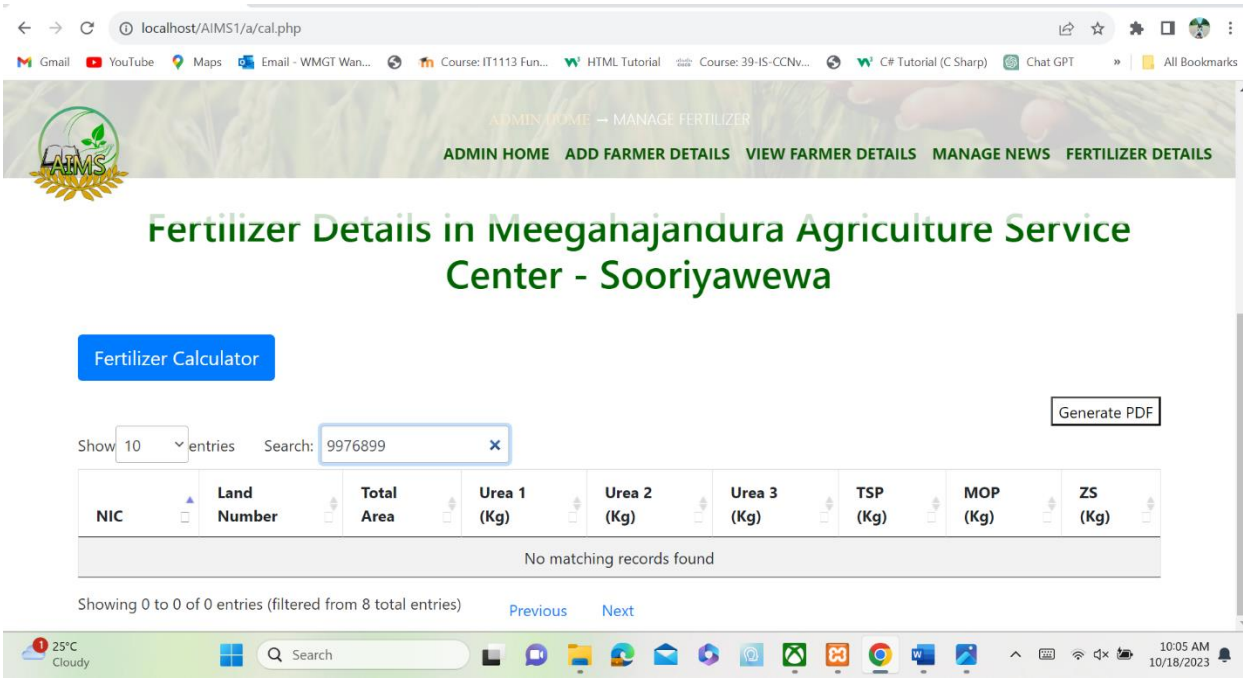


Fertilizer Details Page

Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
19	When searching for required fertilizer details using farmer NIC.	The user should log into the Fertilizer details page as a Development Officer and agriculture Research & production assistant.	1. Go to the Fertilizer Details form. 2. Enter the NIC you want and search.	NIC-996468082v	Show the details in one line.	Show the details in one line.	True

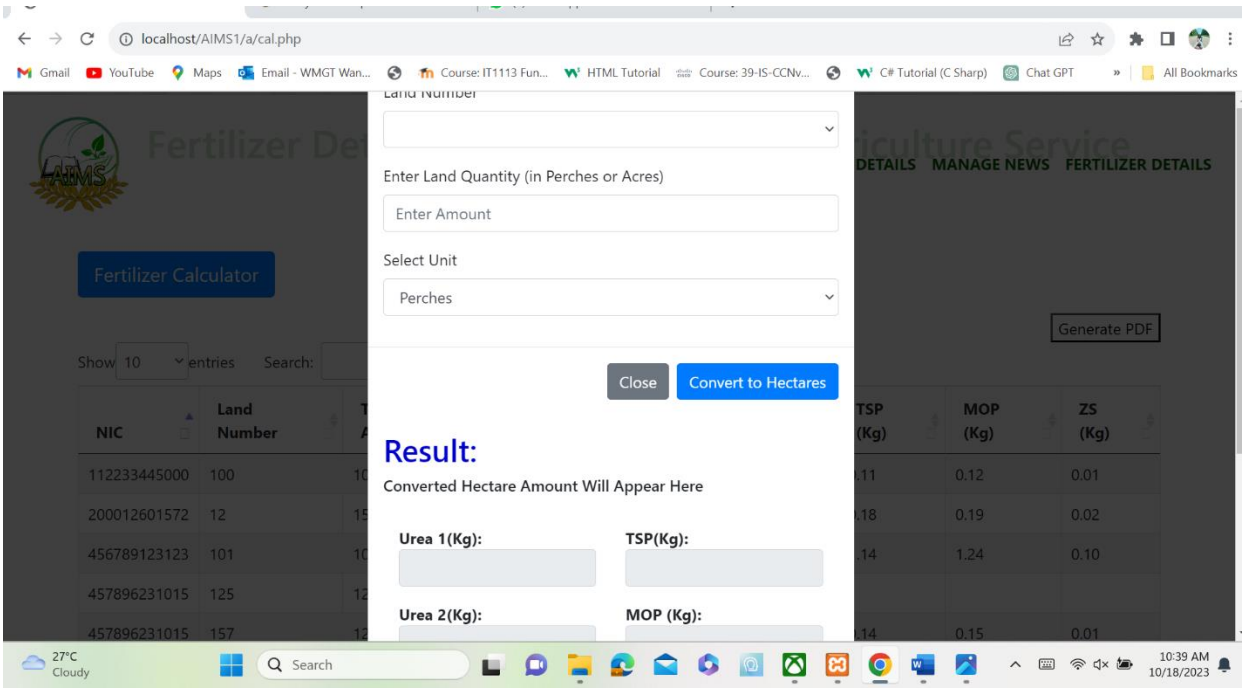


Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
20	When searching for required fertilizer details using unregistered farmer NIC.	The user should log into the Fertilizer details page as a Development Officer and agriculture Research & production assistant.	1. Go to the Fertilizer Details form. 2. Enter the NIC you want and search.	NIC-9976899v	Show the message "No matching records found".	"No matching records found".	True

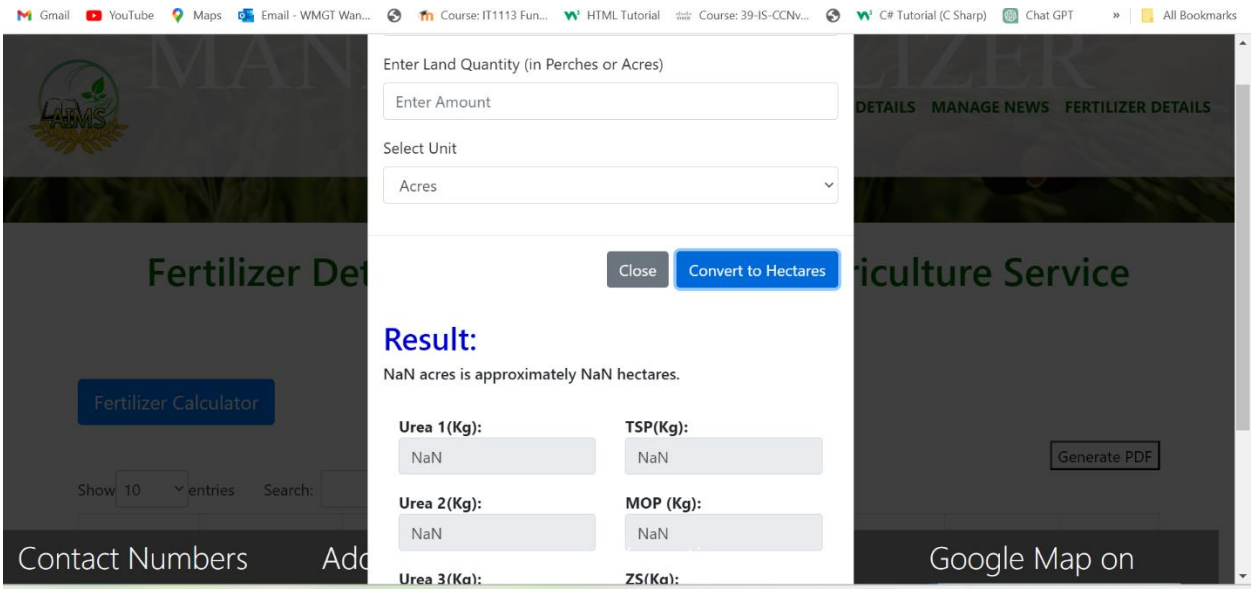


Fertilizer Calculator

Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
21	When clicking on the Fertilize Calculator , Show the calculator.	The user should log into the Fertilizer details page as a Developme nt Officer and agriculture Research & production assistant.	1. Go to the Fertilizer Details form. 2. Click on the Fertilizer calculator.	A button clicks on the Fertilizer Calculator button.	Show the Calculator	Show the Calculator	True



Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
22	When clicking on the Fertilize Calculator and clicking on the Convert to Hectares button without entering the land quantity.	The user should log into the Fertilizer details page as a Developme nt Officer and agriculture Research & production assistant.	1. Go to the Fertilizer Details form. 2. Click on the Fertilizer calculator. 3. Click on the Convert to Hectares button without entering the land quantity.	A button clicks on the Convert to Hectares button.	Show the error message. “Please enter the land quantity”	Show the result “NaN” in the results fields.	False



Test Case ID	Test Case Title	Pre-Requisites	Test Case Description	Input Data	Expected Results	Actual Results	Status
23	When converting the land quantity into the hectares.	The user should log into the Fertilizer details page as a Developme nt Officer and agriculture Research & production assistant.	1. Go to the Fertilizer Details form. 2. Click on the Fertilizer calculator. 3. Enter the land quantity with the unit. 4. Click on the Convert to Hectares button.	Land quantity- 4 Unit - Acres	Show the Calculation results.	Show the Calculation results.	True