



**Crop  
Suitability**  
MAPPING SYSTEM



# CROP SUITABILITY MAPPING USING GEOGRAPHIC INFORMATION SYSTEM

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## USER'S MANUAL

Mary Jarnellen V. Daria  
Camille Aryne S. Sevillena  
Ma Jessa P. Panizal  
Aphrodite E. Labrague



CROP SUITABILITY MAPPING USING GEOGRAPHIC INFORMATION  
SYSTEM

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of the Requirements for the Degree  
Bachelor of Science in Information Systems

Mary Jarnellen V. Daria

Aphrodite E. Labrague

Ma. Jessa P. Panizal

Camille Ayne S. Sevillena

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## **DISCLAIMER**

This software project and its corresponding documentation titled “Crop Suitability Mapping Using Geographic Information System (GIS)” is submitted to the College of Information and Communications Technology, West Visayas State University, in partial fulfillment of the requirements for the degree, Bachelor of Science in Information Systems. It is the product of our own work, except where indicated text.

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Mary Jarnellen V. Daria  
Ma. Jessa P. Panizal

Aphrodite E. Labrague  
Camille Ayne S. Sevillena

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# **GUIDE FOR DEPLOYING AND USING THE SYSTEM'S MAIN FUNCTIONS**

## **Getting Started**

### *Introduction*

The world has reached an era where most of the activities depend on the use of technology. Despite this technological advancement, farmers today still lack capability to improve and strengthen farming activities and routines and rather prefer to go back to their traditional ways of farming. The main focus of this study is to provide crop suitability mapping using geographic information system to those who need it, especially in the field of agriculture. The system collects and stores historical data that can be used for crop management and for monitoring changes in the agricultural areas in terms of the predetermined attributes of crops, soil, and weather. It was developed mainly to help farmers and agricultural sectors to enhance farming strategies of the agricultural sectors in the country by solely relying on data.

This document provides a software manual for the user on how to use the system and what software is needed to run the system.

### *System Requirements*

The system's admin page as well as the user page can run in Windows 7 and up, processors ranging from Intel Celeron and up using desktop and/or laptop.

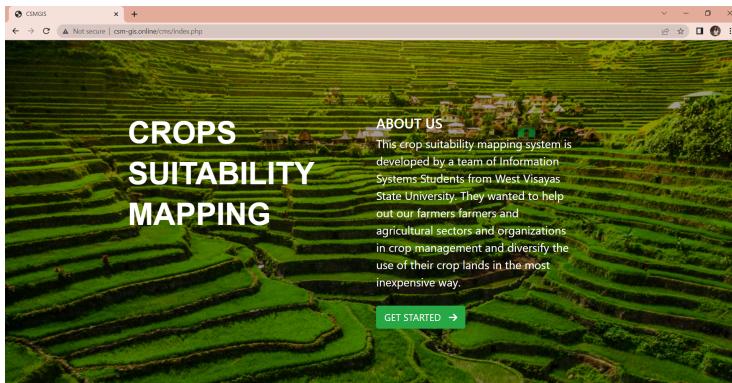
## Usage

### Accessing the User's Page

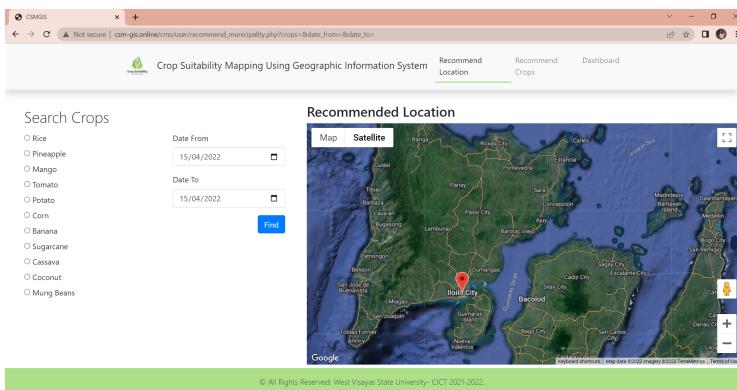
1. Go to the browser and input the link  
**(<http://csm-gis.online/cms/index.php>).**



2. The user will be **redirected** to the landing page of the system.  
A brief overview of the system will welcome the user.



3. After **clicking** the **Get Started** button, the user will be directed to the **Recommend Location Page**.



4. The users can **choose** one **crop** and **date** from the left hand side of the page, after **clicking** the **Find** button, the system will show locations suitable for the crop to grow. So far, the list of crops are the only crops enrolled by the provincial administrator into the system.

The screenshot shows a web-based application titled "Crop Suitability Mapping Using Geographic Information System". In the "Search Crops" section, a radio button is selected for "Rice". Below this, there are dropdown menus for "Date From" (01/04/2022) and "Date To" (30/06/2022). A "Find" button is located next to the date fields. The "Recommended Location" table lists several locations with their respective temperature, humidity, and rainfall values. At the bottom of the page, a copyright notice reads "© All Rights Reserved. West Visayas State University- CICT 2021-2022".

Location	Average Temperature Min/Max	Average Humidity	Average Rainfall
Ajuy	26/28	77	352.25
Ajuy	26/28	79	362.57
Ajuy	27/29	77	342.44
Alimodian	27/29	71	249.28
Alimodian	26/28	78	409.61
Anilao	28/29	73	211.46
Anilao	27/29	70	7.61
Anilao	26/28	79	321.76
Badiangan	28/30	74	234.60
Badiangan	26/28	73	161.23
Balasan	27/28	75	281.67
Balasan	27/29	79	285.38
Balasan	26/28	76	237.76

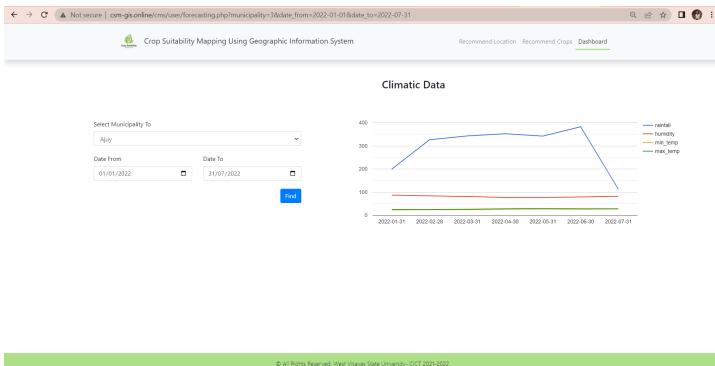
5. In the **Recommend Crops Page**, the users can choose **location** and **date**. After **clicking** the **Find** button, the map will point to the specific location and generate the top-recommended crops that can grow in that area.

The screenshot shows a web-based application titled "Crop Suitability Mapping Using Geographic Information System". In the "Search Municipality" section, "Alimodian" is selected in a dropdown menu. Below this, there are dropdown menus for "Date From" (01/01/2021) and "Date To" (01/01/2022). A "Find" button is located next to the date fields. The "Recommended Crops" table lists a single entry for Cassava. To the right, a map of Alimodian shows various geographical features and landmarks, with a red dot indicating the specific location. A copyright notice at the bottom reads "© All Rights Reserved. West Visayas State University- CICT 2021-2022".

Municipality	Average Temperature Min/Max	Average Humidity	Average Rainfall
Alimodian	25/30	80	493.72

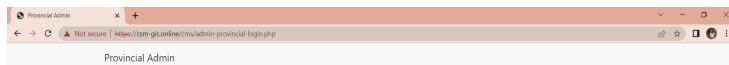
ID	Crops Name	Temperature Min/Max	Humidity Min/Max	Rainfall Min/Max	Elevation	Soil pH
12	Cassava	25/29	80/85	100/1500	1800	4.5/6.5

6. Click the **Dashboard** button and the dashboard page will be displayed. Here, is where the forecasting trends for agro-climatic data will be seen. The user will **select** municipality and date and by clicking the find button, the graph will then **show forecasted observations** for temperature, rainfall, and humidity for the chosen location at the given time ranges.

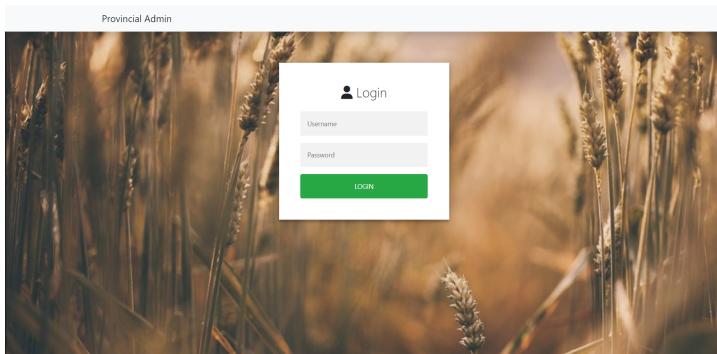


## *Accessing the Provincial Admin Page*

1. In order for the provincial admin to enroll crop and municipality admin data, **go** to the browser and input the link (<https://csm-gis.online/cms/admin-provincial-login.php>).



2. The provincial admin will be redirected to the login page of the system.



The admin will **input** the following credentials:

**username:** Admin

**password:** admin

3. After clicking the **Login** button, the admin will be redirected to the list of municipal admins enrolled in the system. The admin can also edit the data by clicking the **Edit and Remove** button.

The screenshot shows a web application interface titled "Crop Suitability Mapping Using Geographic Information System". At the top right, there are links for "Municipality", "Crops", and "Logout". Below the title, the word "Municipality" is displayed. A sub-menu bar contains "Add Municipality Admin and Geologic data". The main content area is a table titled "Municipality Personal data" and "Municipality Geologic data". The table has columns: ID, Fullname, Email, Contact #, Gender, Municipality, Date Created, and Action. It lists six entries with "Edit" and "Remove" buttons for each row. The footer of the page includes a copyright notice: "© All Rights Reserved. West Visayas State University- CICT 2021-2022."

Municipality Personal data    Municipality Geologic data							
Show	10	entries	Search:				
ID	Fullname	Email	Contact #	Gender	Municipality	Date Created	Action
3	Julie P. Cooper	ajuy@gmail.com	+63932551876	Female	Ajuy	2021-11-30	<button>Remove</button> <button>Edit</button>
4	Raymond S. Phillips	alimodian@gmail.com	+63928555023	Male	Alimodian	2021-11-30	<button>Remove</button> <button>Edit</button>
5	Ann L. Gonzalez	anilao@gmail.com	+639095558598	Female	Anilao	2021-11-30	<button>Remove</button> <button>Edit</button>
6	Ilica D. Sanchez	badiangan@gmail.com	+639325556215	Female	Badiangan	2021-11-30	<button>Remove</button> <button>Edit</button>

4. Clicking the **Municipality** will go to the list of municipalities enrolled in the system as well as its elevation and soil pH. The admin can also edit the data by clicking the **Edit** button.

The screenshot shows a web application interface titled "Crop Suitability Mapping Using Geographic Information System". At the top right, there are links for "Municipality", "Crops", and "Logout". Below the title, the word "Municipality" is displayed. A sub-menu bar contains "Add Municipality Admin and Geologic data". The main content area is a table titled "Municipality Personal data" and "Municipality Geologic data". The table has columns: ID, Municipality, Elevation, Soil pH, Date Created, and Action. It lists eight entries with "Edit" buttons for each row. The footer of the page includes a copyright notice: "© All Rights Reserved. West Visayas State University- CICT 2021-2022."

Municipality Personal data    Municipality Geologic data						
Show	10	entries	Search:			
ID	Municipality	Elevation	Soil pH	Date Created	Action	
3	Ajuy	451	6.0-6.5	2021-11-30	<button>Edit</button>	
4	Alimodian	291	6.0-6.5	2021-11-30	<button>Edit</button>	
5	Anilao	577	5.5-6.0	2021-11-30	<button>Edit</button>	
6	Badiangan	155	6.0-6.5	2021-11-30	<button>Edit</button>	
7	Balasan	813	5.5-6.0	2021-11-30	<button>Edit</button>	
8	Banate	577	5.5-6.0	2021-11-30	<button>Edit</button>	

5. **Clicking** the **Add Municipality and Crop** data will redirect to the **form** where the provincial admin can **input** data of a new municipal admin. The data will be saved in the database after **clicking** the **save** button.

Crop Suitability Mapping Using Geographic Information System

Municipality Crops Logout

Insert Municipality Account

Email\*

Password\*

First Name\*  Middle Name\*  Last Name\*

Gender\*  Choose... Contact Number\*

Municipality\*

Elevation\*  Soil per\*

Latitude\*  Longitude\*

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6. **Clicking** the **Crops** will go to the list of crops enrolled. The provincial admin can also edit the data by clicking the **Edit** button.

Crop Suitability Mapping Using Geographic Information System

Municipality Crops Logout

Crops

Add new crop:

NO	Crop name	Instruction	Elevation	Temperature Min/Max	Humidity Min/Max	Rainfall Min/Max	soil per Min/Max	Date	Action
4	Rice		10-600	20 / 30	60 / 80	112 / 700	5.5 / 6.0	2021-11-30	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
5	Pineapple		150-240	22 / 26	70 / 80	500 / 3500	4.5 / 6.5	2021-11-30	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
6	Mango		200-1200	23 / 45	50 / 95	200 / 1200	5.5 / 7.5	2021-11-30	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
7	Tomato		1650	18 / 25	65 / 90	4200	5.5 / 8.0	2021-11-30	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
8	Potato		100-9000	18 / 20	50 / 85	500 / 700	5.0 / 6.0	2021-11-30	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
9	Corn		100-3600	23 / 45	85 / 95	500 / 800	5.0 / 7.0	2021-11-30	<input type="button" value="Remove"/>

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7. **Clicking** the **Add new Crop** will go to the **form** where the provincial admin can **input** data of the crop's requirement to grow. The data will be saved in the database after **clicking** the **save** button.

Crop Suitability Mapping Using Geographic Information System

Municipality: Crops Logout

Insert Crops

Name*	Elevation*
Minimum Temperature*	Maximum Temperature*
Minimum Humidity*	Maximum Humidity*
Minimum Rainfall*	Maximum Rainfall*
Minimum Soilph*	Maximum Soilph*
Instruction	

Back Save

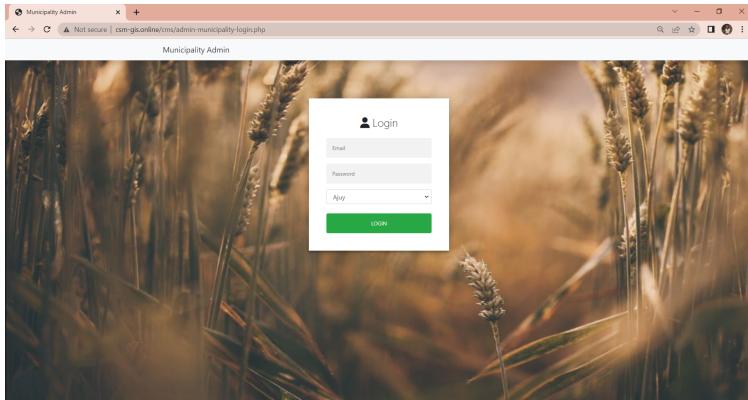
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## *Accessing the Municipality Admin Page*

1. In order for the municipal admin to input their location's agro-climatic data, **go** to the browser and input the link  
**http://csm-gis.online/cms/admin-municipality-login.php**



2. The admin will be redirected to the login page of the system.



The municipal admin will choose municipality and **input** the following credentials:

**username:** ajuy@gmail.com (Municipality+gmail.com),  
**password:** d3f4ult

3. After clicking the **Login** button, the municipal admin will be redirected to the list of agro-climatic data. The admin can also edit the data by clicking the **Edit and Remove** button.

The screenshot shows a web application interface titled "Crop Suitability Mapping Using Geographic Information System". At the top, there is a logo, the title, and a "Logout" link. Below the title, it says "Ajuy Municipality Date Range Temperature". There is a green button labeled "Add Agro-Climatic Data". A table lists six rows of data with columns: No., Temperature (Minimum/Maximum), Humidity, Rainfall, Date, and Action (with "Remove" and "Edit" buttons). The data is as follows:

No.	Temperature (Minimum/Maximum)	Humidity	Rainfall	Date	Action
233	28C / 30C	24	299.6	2020-07-31	<button>Remove</button> <button>Edit</button>
158	25C / 34C	64	14.9	2019-04-30	<button>Remove</button> <button>Edit</button>
75	26C / 34C	65	30.4	2019-04-30	<button>Remove</button> <button>Edit</button>
94	25C / 33C	65	9.3	2020-04-30	<button>Remove</button> <button>Edit</button>
139	26C / 34C	65	33.2	2018-05-31	<button>Remove</button> <button>Edit</button>
159	27C / 34C	65	89.2	2019-05-31	<button>Remove</button> <button>Edit</button>

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4. Clicking the **add Agro-Climatic Data** will go to the form where admin can input data such as date, minimum and maximum temperature, humidity, and rainfall. The data will be saved in the database after clicking the **save** button.

## **Troubleshooting for Fixing Possible Bugs**

In case of problem occurrence try the following:

1. Refresh link or restart web browser.
2. Check connection to your network provider such as cabling and signal.
3. If all of the above is not solving issues, restart your device.
4. Contact the development team for further assistance for troubleshooting.

## **FAQ (Frequently Asked Questions)**

### **Q1. What is a Crop Suitability Mapping System?**

Crop Suitability Mapping System is a website that helps agricultural sectors such as farmers to improve farming practices by recommending crops based on the crops requirements for growth. This system is a low cost approach to precision agriculture that is driven by data.

### **Q2. How does the Logic Scoring Preference help crop suitability?**

The LSP algorithm originated from fuzzy reasoning. Once a crop's requirements fit in the location's agro-climatic and agro-geologic data ranges within a time period, the system then recommends the crop suitable for planting and/or the location suitable for the crop to be planted.

### **Q3. How can a person be an administrator?**

There are two types of administrator, provincial and municipal administrator. There can only be one provincial administrator who can handle the system in this way the integrity of the data will not be at risk. The provincial administrator can enroll as many municipal administrators but there must be only one municipal administrator in every municipality.

**Q4. Do I need internet connection to access the system?**

Yes. The system can only be accessed through the web. This was made so that once the system will be deployed in the intended offices for permanent use, the system can be accessible anywhere on devices without high specifications.

**Q5. Who are intended users of the system?**

Mainly, the system was built for public use of agricultural sectors in the Province of Iloilo. However, anybody related and interested in low cost precision farming can also access the system.

**Q6. Can the system be accessible by anybody?**

Yes. The system is available online.

**Q7. What data is being gathered by the system?**

For admin enrollment, personal information of the municipal administrators are gathered by the provincial administrator to ensure the reliability of the person in charge for every municipality. Name, address, contact details, date of birth are being gathered, and the rest are agro-geologic data of the location to where the municipal administrator is assigned. The municipal admin is also required to daily supplement agro-climatic data of their location. For users, the system does not gather any personal information.

**Q8. What is being forecasted by the system?**

Agro-climatic data of a specific location at a given time of the year is the only data that are being forecasted in the system. The system can only forecast a maximum of three (3) years.

## Contact Details of the Development Team

Name	Email	Phone Number
Mary Jarnellen Daria	maryjarnellen.daria@wvsu.edu.ph	09773120152
Aphrodite Labrague	aphrodite.labrague@wvsu.edu.ph	09352171967
Ma. Jessa Panizal	majessa.panizal@wvsu.edu.ph	09563460591
Camille Aryne Sevillena	camillearyne.sevillena@wvsu.edu.ph	09661665890