CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Agricultural information is an important factor that interacts with other production factors. Productivity of these other factors, such as land, labour, capital and managerial ability, can arguably be improved by relevant, reliable and useful information. Information supplied by extension, research, education and agricultural organizations helps farmers make better decisions. Therefore, there is a need to understand the functioning of a particular agricultural information system in order to manage and improve it.

An effective and efficient delivery system of essential information and technology services facilitates the clients' critical role in decision-making towards improved agricultural production, processing, trading, and marketing. Food and Agriculture Organization points out, information is very important for rural development because improving the income of farming community will depend crucially upon raising agricultural productivity. The adoption of new agricultural technologies by farmers is often very slow and research is not focusing on the actual needs of farmers.

Therefore, the information systems which integrate farmers, agricultural educators, researchers, extension and farmers should be introduced for agriculture sector. They operate as facilitators and communicators helping farmers in their decision making and ensuring that appropriate knowledge is implemented in order to obtain the best results in terms of sustainable production and general rural development.

Admin can update database by using web browser but he/she Does not need to know how the query is to be made using SQL. An example, if Admin needs to update their new research description to database, he/she only needs to know log on name and password they have been given. Then he/she can update database without knowledge of SQL using internet.

AgriEase systems is a management system that offers a platform for users and farmers where the users can get information about the crops that are being harvested by the farmers. It offers weather updates and agricultural tips for both farmers and years.

1.2 DBMS (DATABASE MANAGEMENT SYSTEM)

Database is a collection of related data and data is a collection of facts and figures that can be processed to produce information. Mostly data represents recordable facts. Data aids in producing information, which is based on facts. For example, if we have data about marks obtained by all students, we can then conclude about toppers and average marks.

A database management system (DBMS) is a software package designed to define, manipulate, retrieve and manage data in a database. A DBMS generally manipulates the data itself, the data format, field names, record structure and file structure. It also defines rules to validate and manipulate this data.

A DBMS relieves users of framing programs for data maintenance. Fourth- generation query languages, such as SQL, are used along with the DBMS package to interact with a database. Some other DBMS examples include:

- MySQL
- SQL Server
- Oracle
- dBASE
- FoxPro

1.3 PHP (HYPERTEXT PREPROCESSOR)

PHP is the most popular and widely used server-side scripting language for web development. It is used to make the Dynamic pages in websites. Rasmus Lerdorf was the creator of PHP in 1995. PHP codesare embedding in HTML source codes for making the page dynamic. PHP can deal with most of the requirements in web development like Database, File handling, String operations, Arrays, Graphics, File Uploads, Data processing etc. PHP can be used in any operating system with a web server Supports PHP. Apache web server is one of the popular web servers dealing with PHP + MySQL. Moreover, PHP is absolutely free to use.

1.4 PROBLEM STATEMENT

It is a challenging and tedious job to make decisions for allocation of resources and keep track of the farmers, their listing of crops with its needed soil. It can be a hassle to provide the farmer with weather reports, to provide a single interface for citizens, services of the government and private businesses in an integrated, convenient and effective way with integrated weather reports.

Hence, there is a need for system that resolves the above-mentioned shortcomings.

1.5 OBJECTIVES

- To build an application program in order to reduce the manual work for managing the details of the farmers, crops, agriculture tips and type of soil required for growing crops.
- To manage the details of the farmers, crops and the suitable soil required for growing crops.
- To tracks all the details about the crops , agriculture tips which includes Insecticides, Pesticides.
- To provide weather forecasting in order to enhance the crop growth.

CHAPTER 2

SYSTEM REQUIREMENTS AND SPECIFICATION

2.1 Hardware Requirement

The hardware required for the development of this project is:

- Processor - Intel core i5
- Processor speed - 2.42 GHz
- RAM - 4 GB RAM
- System Type - 64-bit operating system
- Hard disk - 512 GB

2.2 Software Requirement

The software required for the development of this project is:

- Operating System - Windows 7 or Above
- Front End - HTML, CSS, JavaScript
- Back End - My SQL
- Middleware - PHP
- Server - Xampp Server

CHAPTER 3

SYSTEM DESIGN

3.1 ENTITY-RELATIONSHIP DIAGRAM

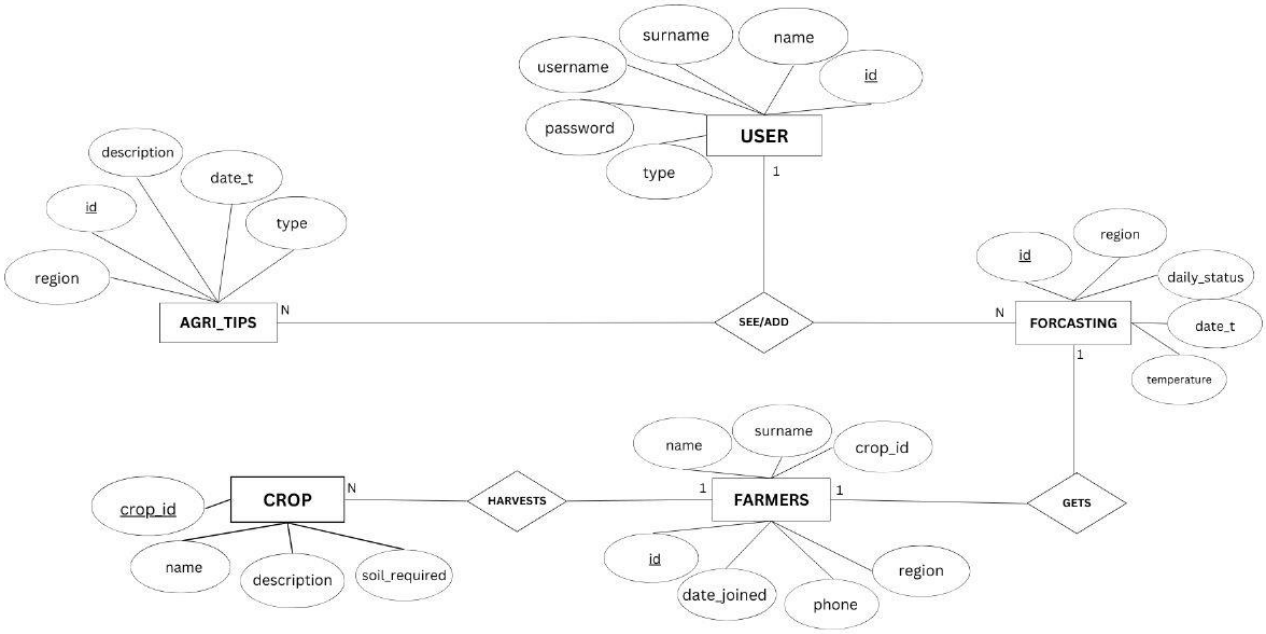
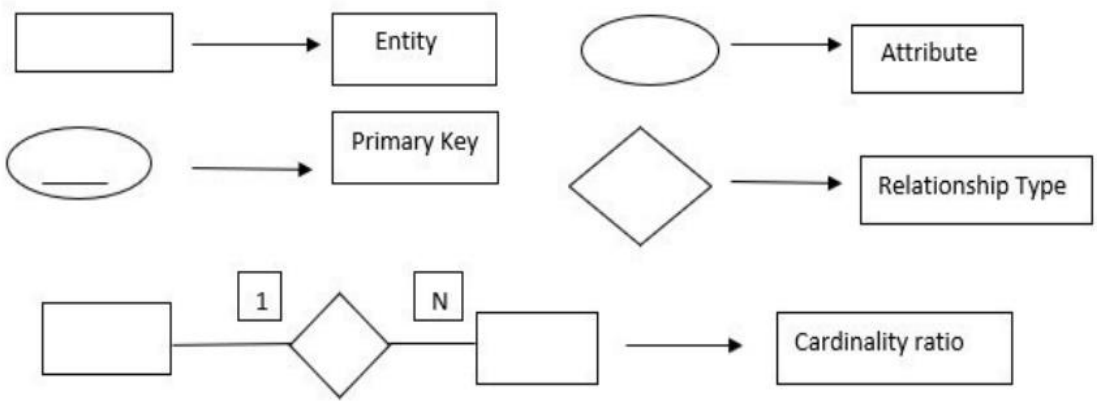


Fig 3.1: Entity-Relationship diagram



3.2 ER DESCRIPTION

The ER Model figure shows conceptual view of the database. It works around real-world entities and the associations among them. At view level, the ER model is considered a good option for designing databases.

FARMERS TABLE

This entity stores the information about farmers who registers and provides his crop details.

CROP TABLE

This entity stores the information about the respective crop such as crop description and the suitable soil for its growth.

FORECASTING TABLE

This entity shows the information about current weather conditions of the particular region specified.

USERS TABLE

This entity stores the information about the users who registers such as username and password etc.

AGRI_TIPS

This entity provides the necessary suggestions and tips related to enhance crop growth.

ENTITIES:

- FARMERS
- CROP
- FORECASTING
- AGRI_TIPS
- USER

RELATIONSHIPS:

- Gets: FARMERS gets FORECASTING
- Harvests: FARMERS harvests CROP
- Sees: USER sees FORECASTING
- Gives: USER gives AGRI_TIPS

ATTRIBUTES:

FARMERS	USER	FORECASTING	CROP	AGRI_TIPS
• farmer_id • name • surname • region • phone • crop_id • date_joined	• user_id • name • surname • username • password • type	• forecast_id • region • status • date_t • temperature	• crop_id • name • description • soil_required	• tips_id • description • region • date_t • type

KEY ATTRIBUTES:

- farmer_id: It is a key attribute of FARMERS entity.
- crop_id: It is a key attribute of CROP entity.
- forecast_id: It is a key attribute of FORECASTING entity.
- user_id: It is a key attribute of USER entity.
- tips_id: It is a key attribute of AGRI_TIPS entity.

3.3 SEVEN STEPS FOR ER TO SCHEMA CONVERSION

Step 1: Mapping of Regular Entity Types.

For each regular (strong) entity type E in the ER schema, create a relation R that includes all the simple attributes of E. Include only the simple component attributes of a composite attribute. Choose one of the key attributes of E as the primary key for R. If the chosen key of E is a composite, then the set of simple attributes that form it will together form the primary key of R. If multiple keys were identified for E during the conceptual design, the information describing the attributes that form each additional key is kept in order to specify secondary (unique) keys of relation R. Knowledge about keys is also kept for indexing purposes and other types of analyses.

Step 2: Mapping of Weak Entity Types.

For each weak entity type W in the ER schema with owner entity type E, create a relation R and include all simple attributes (or simple components of composite attributes) of was attributes of R. In addition, include as foreign key attributes of R, the primary key attribute(s) of the relation(s) that correspond to the owner entity type(s); this takes care of mapping the identifying relationship type of W. The primary key of R is the combination of the primary key(s) of the owner(s) and the partialkey of the weak entity type W, if any. If there is a weak entity type E2 whose owner is also a weak entity type E1, then E1 should be mapped before E2 to determine its primary key first.

Step 3: Mapping of Binary 1:1 Relationship Types.

For each binary 1:1 relationship type R in the ER schema, identify the relations S and T that correspond to the entity types participating in R. There are three possible approaches:
1. The foreign key approach.

2.The merged relationship approach, and the first approach is the most useful and should be followed unless special conditions exist, as we discuss below.

1. Foreign key approach*:*

Choose one of the relations—S, say—and include as a foreign key in S the primary key of T. It is better to choose an entity type with total participation in R in the role of S. Include all the simple attributes (or simple components of composite attributes) of the 1:1 relationship type R as attributes of S.

2. Merged relation approach:

An alternative mapping of a 1:1 relationship type is to merge the two entity types and the relationship into a single relation. This is possible when both participations are total, as this would indicate that the two tables will have the exact same number of tuples at all times.\

3. Cross-reference or relationship relation approach:

The third option is to set up a third relation R for the purpose of cross-referencing the primary keys of the two relations S and T representing the entity types. As we will see, this approach is required for binary M: N relationships. The relation R is called a relationship relation (or sometimes a lookup table), because each tuple in R represents a relationship instance that relates one tuple from S with one tuple from T. The relation R will include the primary key attributes of S and T as foreign keys to S and T. The primary key of R will be one of the two foreign keys, and the other foreign key will be a unique key of R. The drawback is having an extra relation, and requiring an extra join operation when combining related tuples from the tables.

Step 4: Mapping of Binary 1: N Relationship Types.

For each regular binary 1: N relationship type R, identify the relation S that represents the participating entity type at the N-side of the relationship type. Include as foreign key in S the primary key of the relation T that represents the other entity type participating in R; we do this because each entity instance on the N-side is related to at most one entity instance on the 1-side of the relationship type. Include any simple attributes (or simple components of composite attributes) of the 1: N relationship type as attributes of S.

Step 5: Mapping of Binary M: N Relationship Types.

For each binary M: N relationship type R, create a new relation S to represent R. Include as foreign key attributes in S the primary keys of the relations that represent the participating entity types; their combination will form the primary key of S. Also include any simple attributes of the M: N relationship type (or simple components of composite attributes) as attributes of S.

Notice that we cannot represent an M: N relationship type by a single foreign key attribute in one of the participating relations (as we did for 1:1 or 1: N relationship types) because of the M: N cardinality ratio; we must create a separate relationship relation S.

Step 6: Mapping of Multivalued Attributes.

For each multivalued attribute A, create a new relation R. This relation R will include an attribute corresponding to A, plus the primary key attribute K—as a foreign key in R—of the relation thatrepresents the entity type or relationship type that has A as a multivalued attribute. The primary key of R is the combination of A and K. If the multivalued attribute is composite, we include its simple components.

Step 7: Mapping of N-array Relationship Types.

For each n-array relationship type R, where n > 2, create a new relation S to represent R. Include as foreign key attributes in S the primary keys of the relations that represent the participating entity types. Also include any simple attributes of the n-array relationship type (or simple components of composite attributes) as attributes of S. The primary key of S is usually a combination of all the foreign keys that reference the relations representing the participating entity types. However, if the cardinality constraints on any of the entity types E participating in R is 1, then the primary key of S should not include the foreign key attribute that references the relation E ‘corresponding to E.

3.4 SCHEMA DIAGRAM

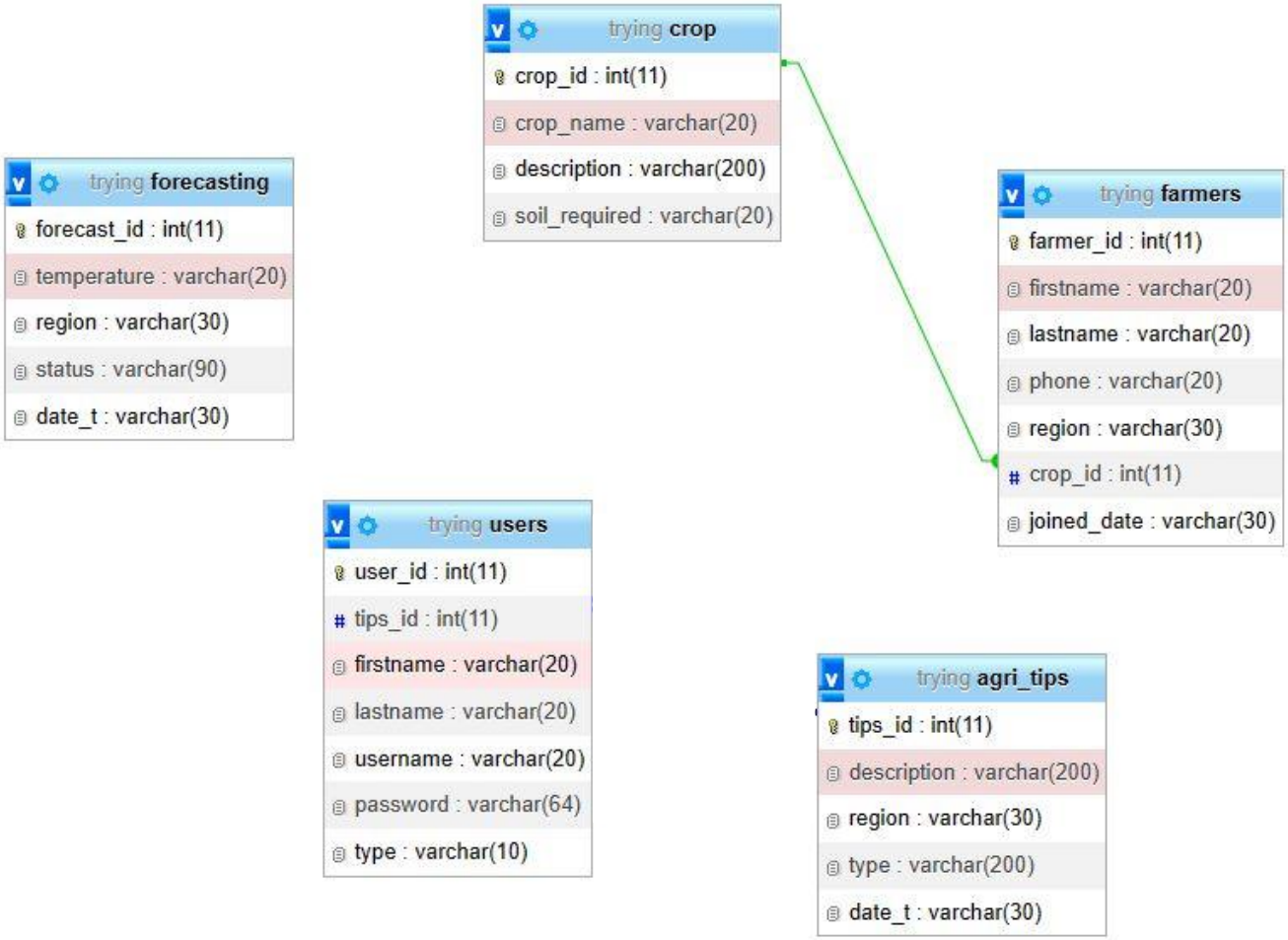


Fig 3.4: Schema diagram

3.5 DATABASE DESCRIPTION

USERS TABLE

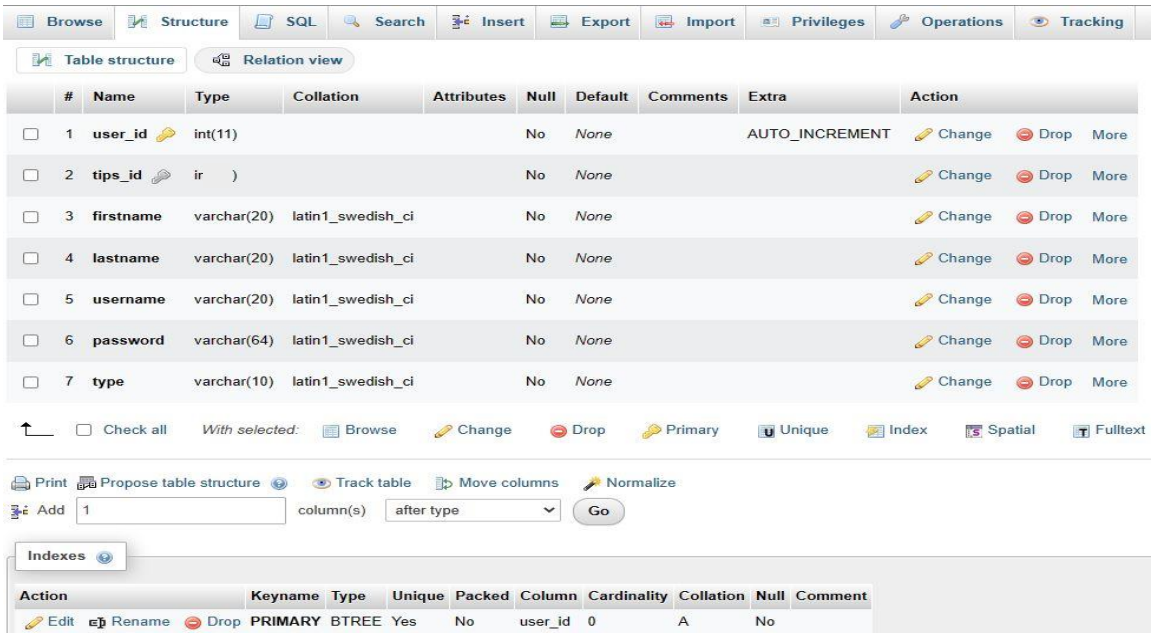


Table 3.5.1 shows all the attributes of USER table

FORECASTING TABLE

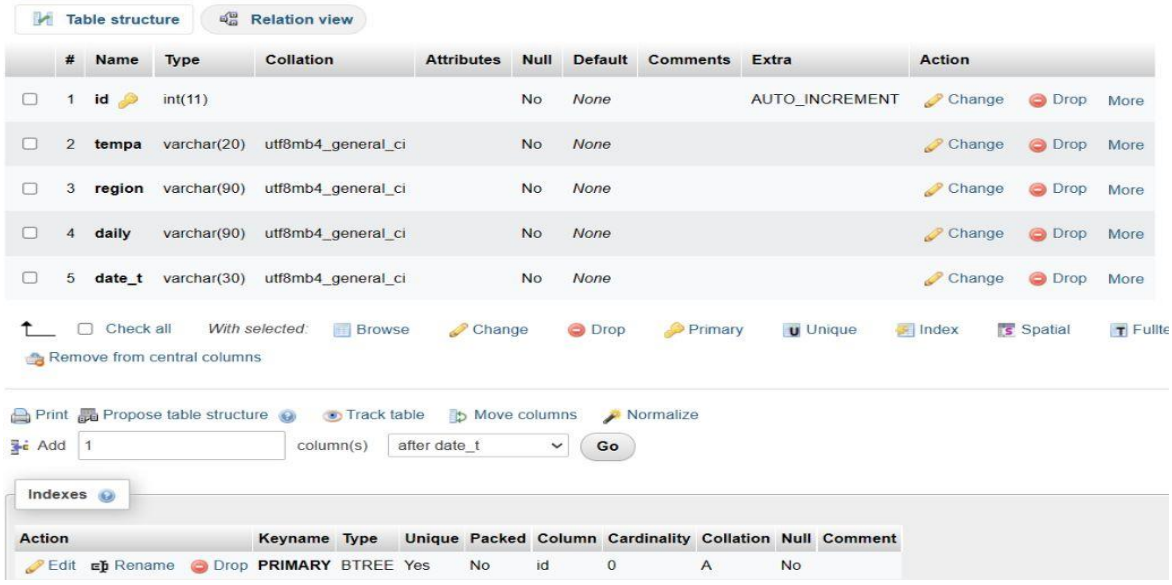


Table 3.5.2 shows all the attributes of FORECASTING table

FARMERS TABLE

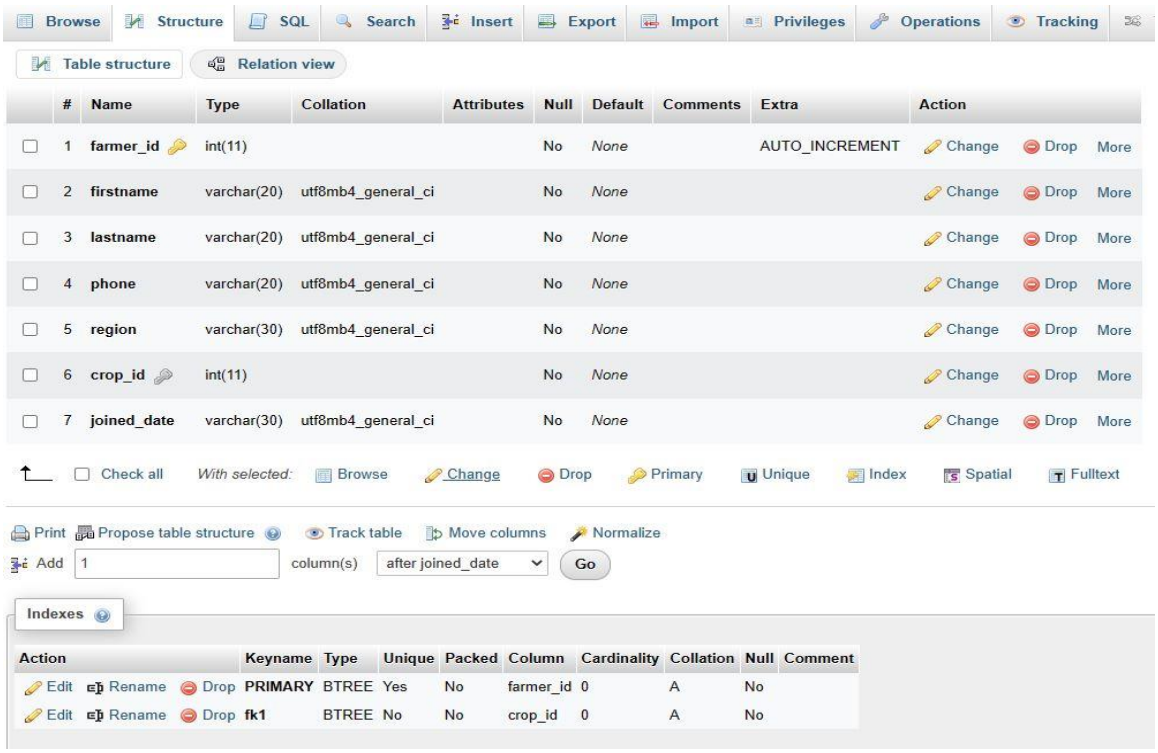


Table 3.5.3 shows all the attributes of FARMERS table

CROP TABLE

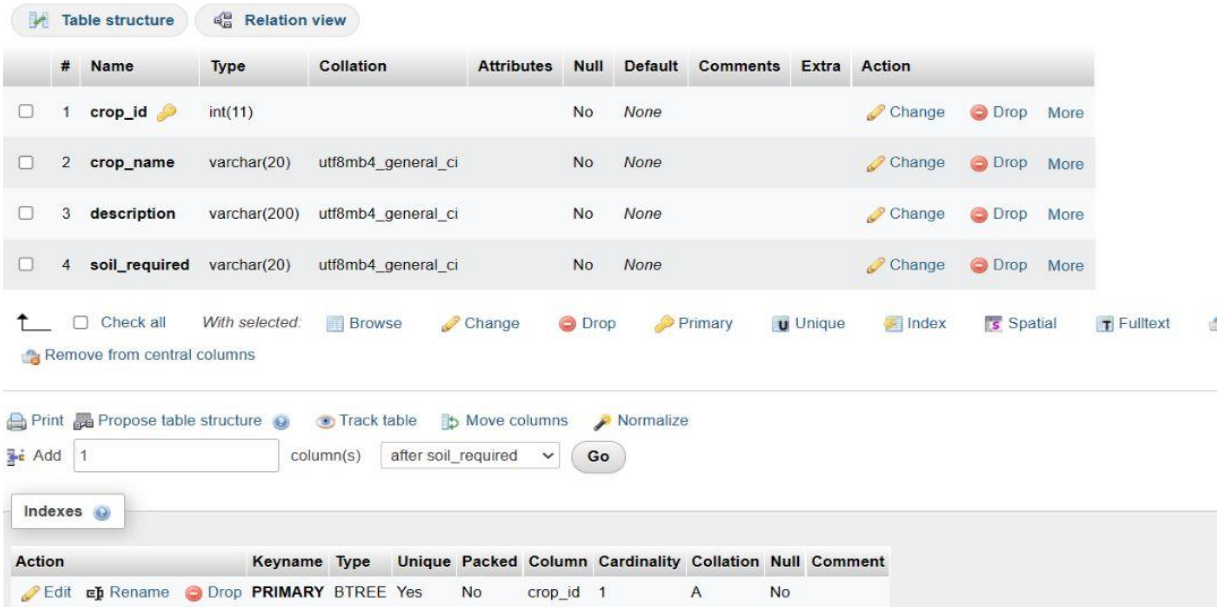


Table 3.5.4 shows all the attributes of CROP table

AGRI_TIPS TABLE

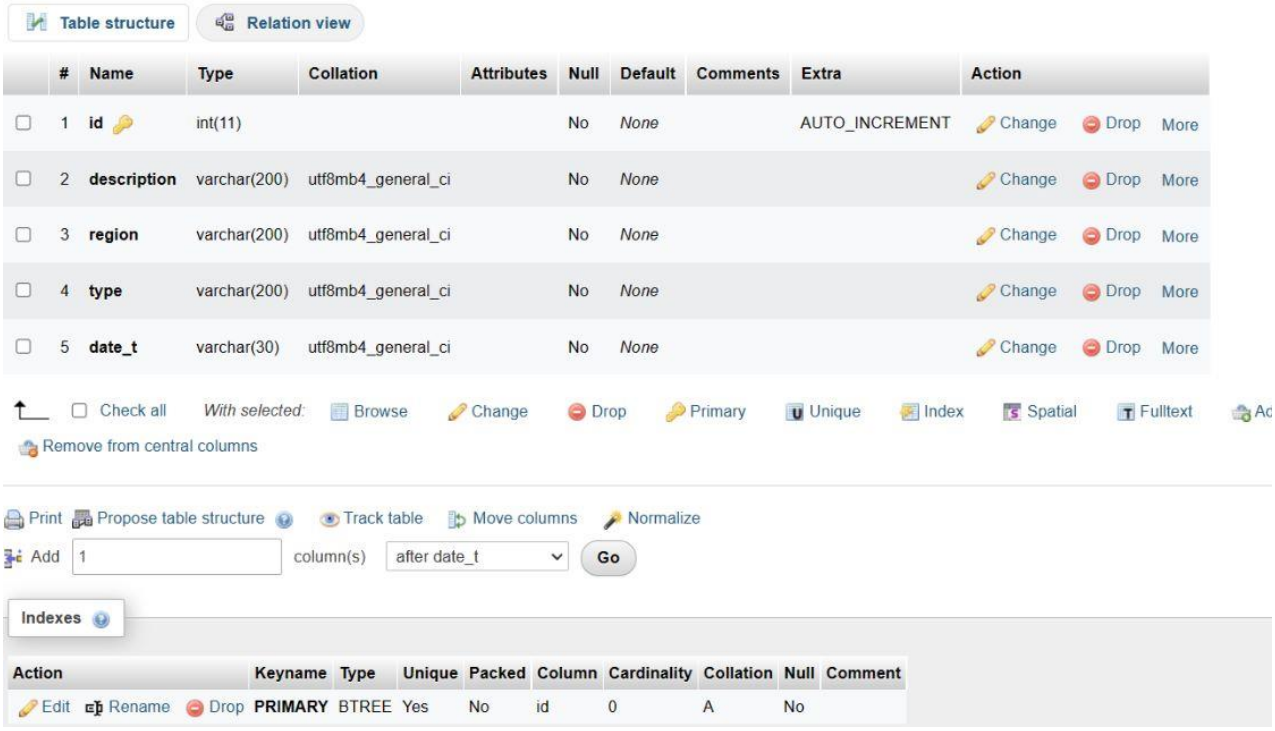


Table 3.5.5 shows all the attributes of AGRI_TIPS table

CHAPTER 4

IMPLEMENTATION

4.1 CODE TO CONNECT FRONT END AND BACK END

```
<?php
$con =
mysqli_connect("localhost","root","","devel
opers");if (mysqli_connect_errno())
{
        echo "Failed to connect to MySQL: " . mysqli_connect_error();
}
?>
```

4.2 SQL STATEMENTS

4.2.1 CODE TO CREATE TABLES

```
CREATE TABLE `agri_tips` (
  `id` int(11) NOT NULL,
  `description` varchar(200) NOT NULL,
  `region` varchar(200) NOT NULL,
  `type` varchar(200) NOT NULL,
  `date_t` varchar(30) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
```

```
CREATE TABLE `farmers` (
  `id` int(11) NOT NULL,
  `name` varchar(20) NOT NULL,
  `surname` varchar(20) NOT NULL,
  `phone` varchar(20) NOT NULL,
  `region` varchar(20) NOT NULL,
  `crop_id` int(11) NOT NULL,
  `joined_date` varchar(30) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
```

```
CREATE TABLE `farmers` (
  `id` int(11) NOT NULL,
  `name` varchar(20) NOT NULL,
  `surname` varchar(20) NOT NULL,
  `phone` varchar(20) NOT NULL,
  `region` varchar(20) NOT NULL,
  `crop_id` int(11) NOT NULL,
  `joined_date` varchar(30) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4;
```

```
CREATE TABLE `users` (
  `id` int(11) NOT NULL,
  `name` varchar(20) NOT NULL,
  `surname` varchar(20) NOT NULL,
  `username` varchar(20) NOT NULL,
  `password` varchar(64) NOT NULL,
  `type` varchar(10) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

```
CREATE TABLE `crop` (
  `crop_id` int(11) NOT NULL,
  `crop_name` varchar(20) NOT NULL,
  `description` varchar(200) NOT NULL,
  `soil_required` varchar(20) NOT NULL
) ENGINE=InnoDB;
```

4.2.2 CODE TO INSERT NEW VALUES

```
INSERT INTO `agri_tips` (`id`, `description`, `region`, `type`, `date_t`) VALUES
(2, 'insecticide Thiamethoxam 30% SC, 21% SC, good control effect on rice planthopper Usage method 1. To control rice planthopper, 25% thiamethoxazine ', 'Harare', 'Agricultural Insecticides', '2020-01-12');
```

```
INSERT INTO `farmers` (`id`, `name`, `surname`, `phone`, `region`, `joined_date`) VALUES
(3, 'tapiwa', 'mhishi', '0775011617', 'Harare', '2020-01-12'),
(5, 'Gideon', 'Machuve', '0775509424', 'Harare', '2020-01-12');
```

```
INSERT INTO `forecasting` (`id`, `tempa`, `region`, `daily`, `date_t`) VALUES
(1, '24', 'Harare', 'partly Clouds', '12 Jan 2020');
```

```
INSERT INTO `users` (`id`, `name`, `surname`, `username`, `password`, `type`) VALUES
(1, 'Bhoomi', 'Shree', 'admin', '827ccb0eea8a706c4c34a16891f84e7b', 'user'),
(4, 'sam', 'strover', 'samstrover', '827ccb0eea8a706c4c34a16891f84e7b', 'user'),
(5, 'chido', 'makura', '', 'd41d8cd98f00b204e9800998ecf8427e', 'user');
```

```
INSERT INTO `crop` (`crop_id`, `crop_name`, `description`, `soil_required`) VALUES
(11, 'Cotton', 'Cotton is used in Garments', 'Black Soil');
```

4.2.3 CODE FOR ALTER TABLE DESCRIPTION

Primary Keys

```
ALTER TABLE `agri_tips`
  ADD PRIMARY KEY (`id`);
```

```
ALTER TABLE `farmers`
  ADD PRIMARY KEY (`id`);
```

```
ALTER TABLE `forecasting`
  ADD PRIMARY KEY (`id`);
```

```
ALTER TABLE `users`
  ADD PRIMARY KEY (`id`);
```

Foreign Keys

```
ALTER TABLE `farmers`
  ADD CONSTRAINT `fk1` FOREIGN KEY (`id`) REFERENCES `crop` (`id`) ON DELETE
CASCADE ON UPDATE CASCADE;
```

Auto Increment and Auto Decrement

```
ALTER TABLE `agri_tips`
  MODIFY `id` int(11) NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=3;
```

```
ALTER TABLE `farmers`
  MODIFY `id` int(11) NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=6;
```

```
ALTER TABLE `forecasting`
  MODIFY `id` int(11) NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=3;
```

```
ALTER TABLE `users`
  MODIFY `id` int(11) NOT NULL AUTO_INCREMENT, AUTO_INCREMENT=6;
COMMIT;
```

4.3 EMBEDDED SQL QUERIES

4.3.1 farms_add.php

```
<?php  include_once ('page-headers.php'); ?>
        <div class="line"></div>
        <?php
                    if(isset($db,$_POST['submit'])){
                    $name = mysqli_real_escape_string($db,$_POST['name']);
                    $surname = mysqli_real_escape_string($db,$_POST['surname']);
                    $phone = mysqli_real_escape_string($db,$_POST['phone']);
                    $region = mysqli_real_escape_string($db,$_POST['region']);
                    $joined_date = date('Y-m-d');
                    $sql_e = "SELECT * FROM farmers WHERE phone ='$phone'";
                    $res_e = mysqli_query($db, $sql_e);
                    if(mysqli_num_rows($res_e) > 0){
                    ?>
```

4.3.2 crop_add.php

```
<?php  include_once ('page-headers.php'); ?>
        <div class="line"></div>
        <?php
                    if(isset($db,$_POST['submit'])){
                    if(isset($db,$_POST['crop_id'])){
                    $crop_id = mysqli_real_escape_string($db,$_POST['crop_id']);}
                    if(isset($db,$_POST['crop_name'])){
                    $crop_name = mysqli_real_escape_string($db,$_POST['crop_name']);}
                    if(isset($db,$_POST['description'])){
                    $description = mysqli_real_escape_string($db,$_POST['description']);}
                    if(isset($db,$_POST['soil_required'])){
                    $soil_required = mysqli_real_escape_string($db,$_POST['soil_required']);}
                    $sql_e = "SELECT * FROM crop WHERE crop_id ='$crop_id'";
                    $res_e = mysqli_query($db, $sql_e);
                    if(mysqli_num_rows($res_e) > 0){
                    ?>
```

CHAPTER 5

SNAPSHOTS

1.Login Page

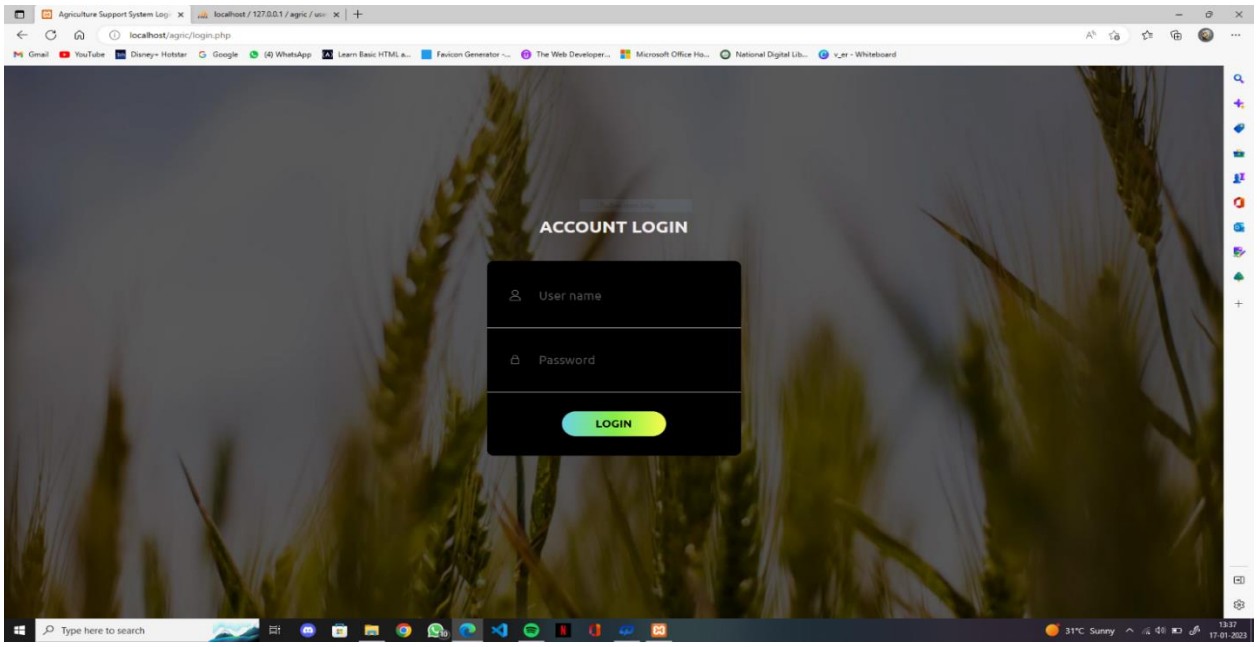


Fig 5.1: Login Page

2.Dashboard

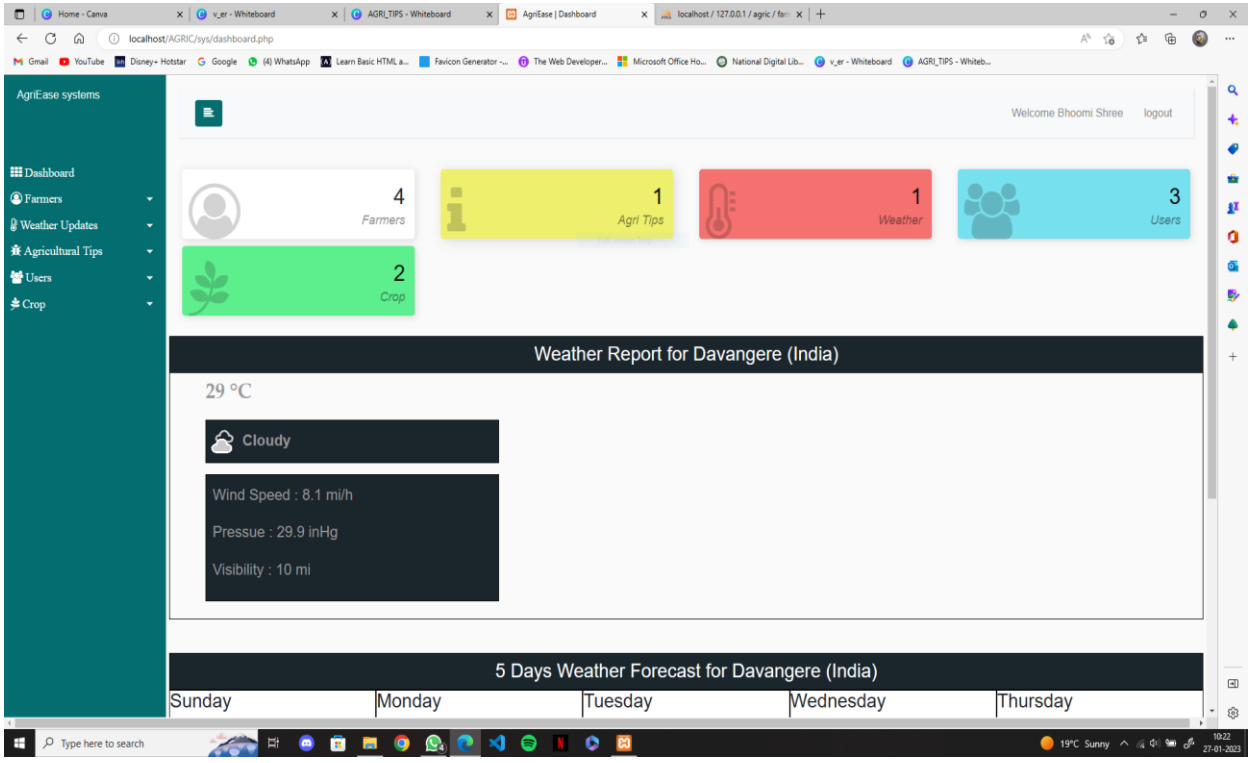


Fig 5.2: Dashboard

3.Weather Report

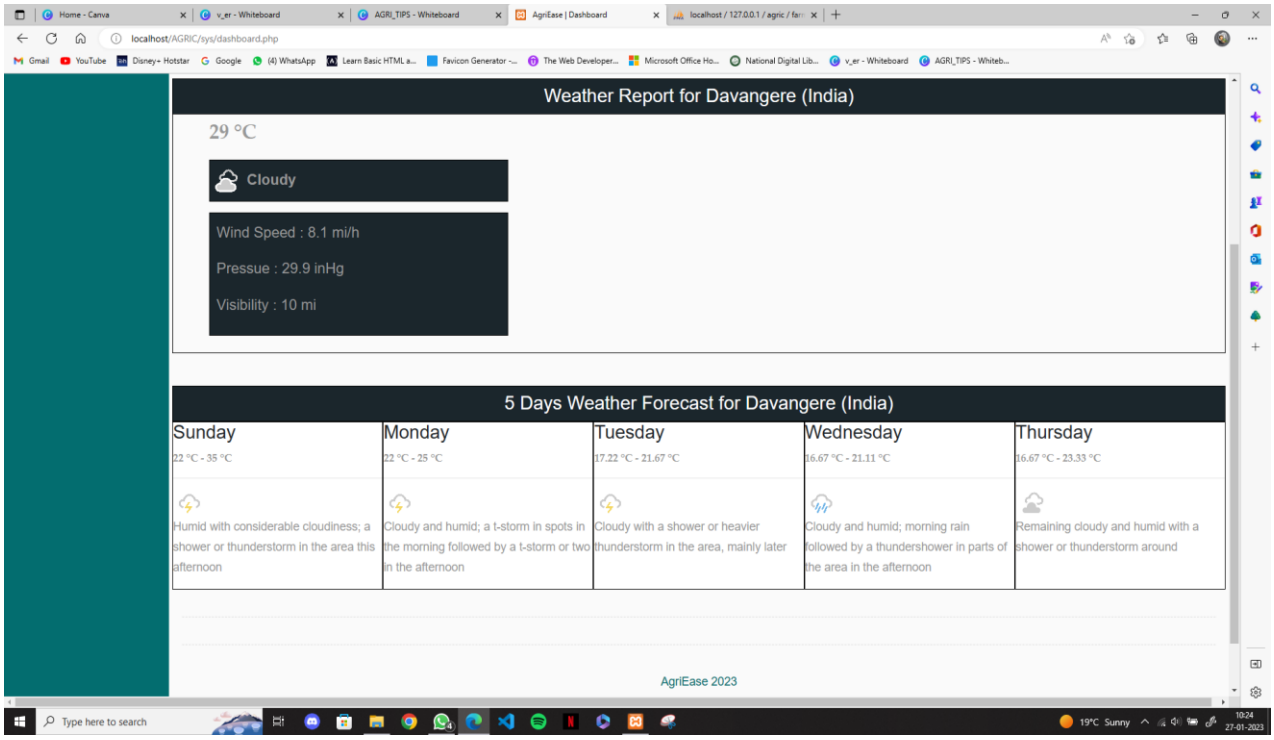


Fig 5.3: Weather Report

4.Add Farmer

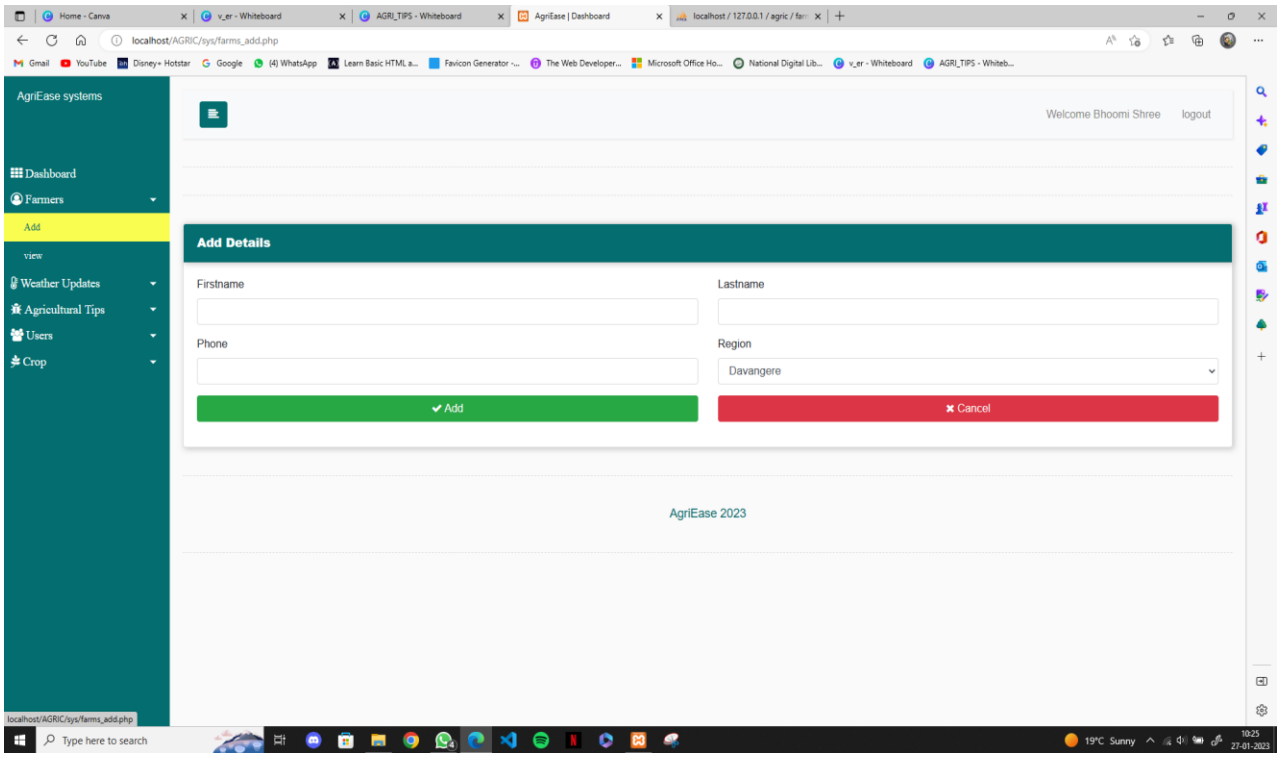


Fig 5.4: Add Farmer

5.View Farmers

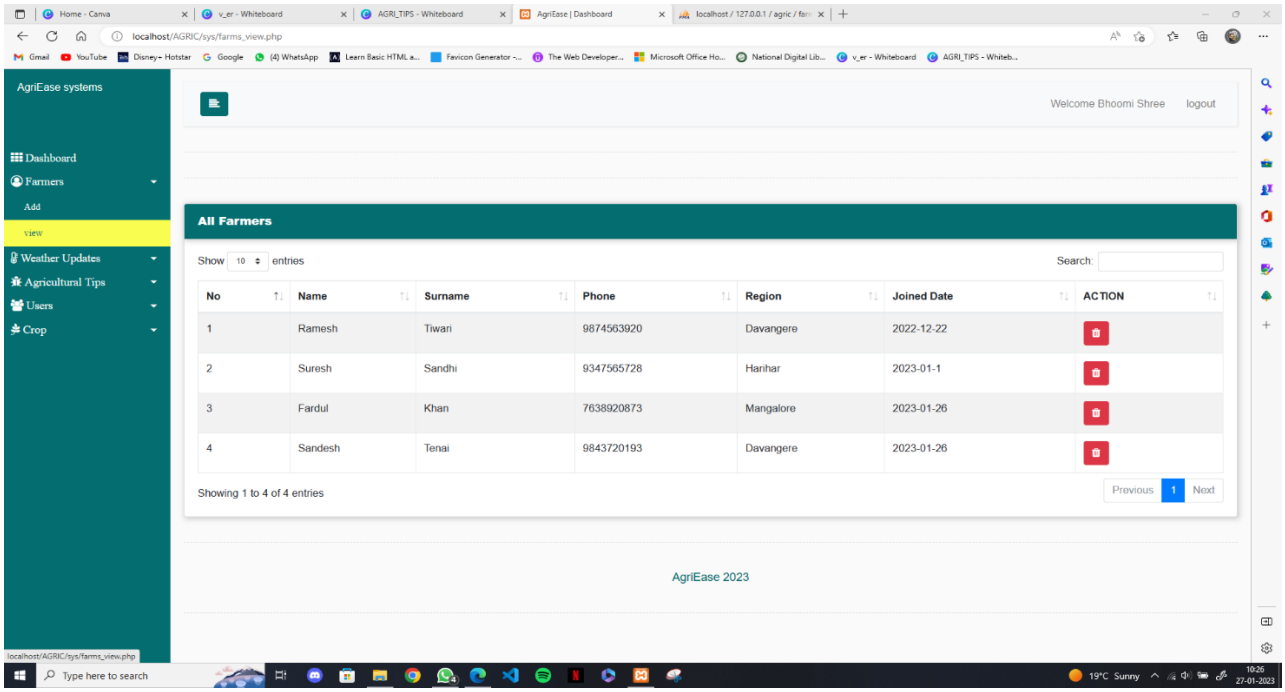


Fig 5.5: View Farmers

6.Add Weather Update

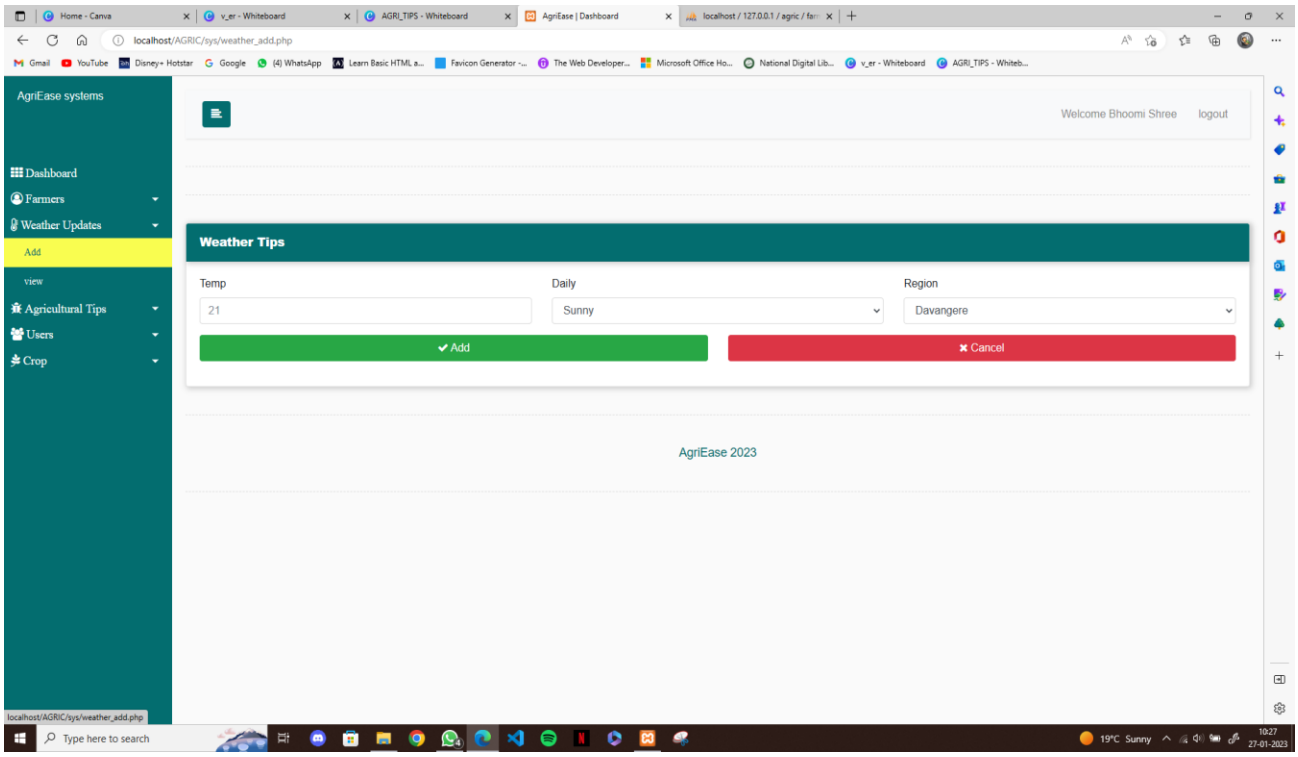


Fig 5.6: Add Weather Update

7.View Weather Update

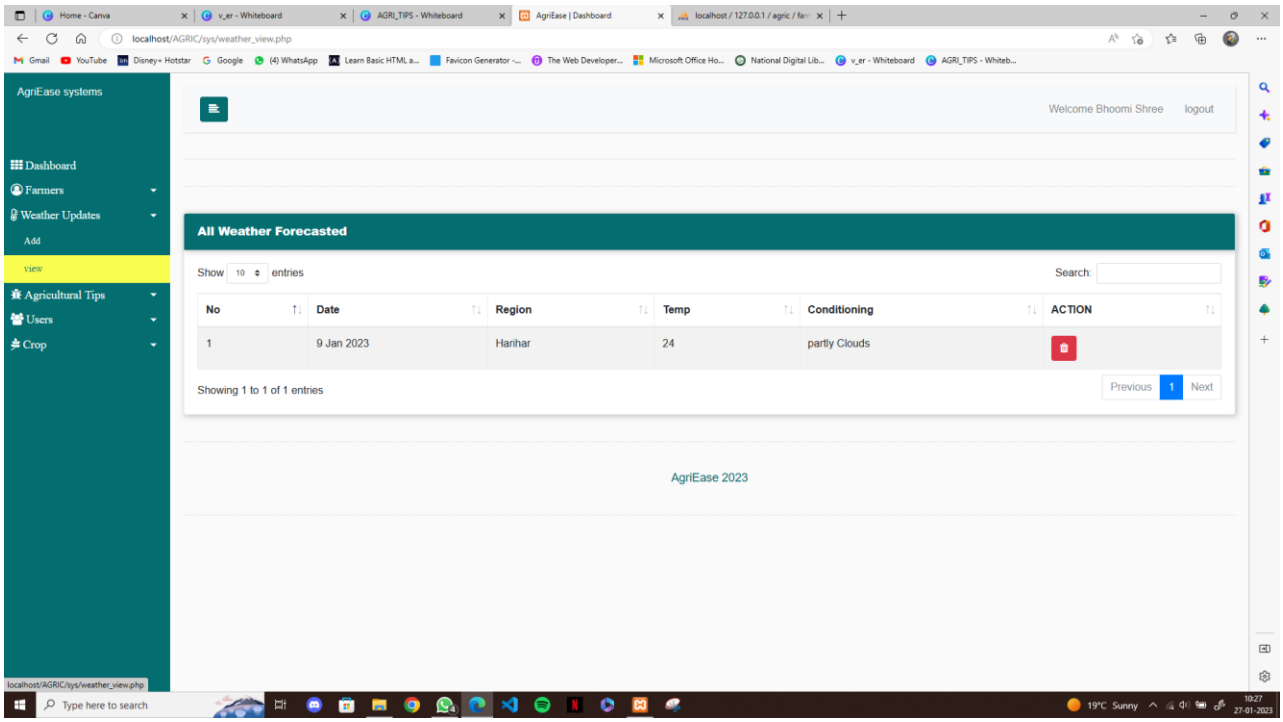


Fig 5.7: View Weather Update

8.Add Agricultural Tips

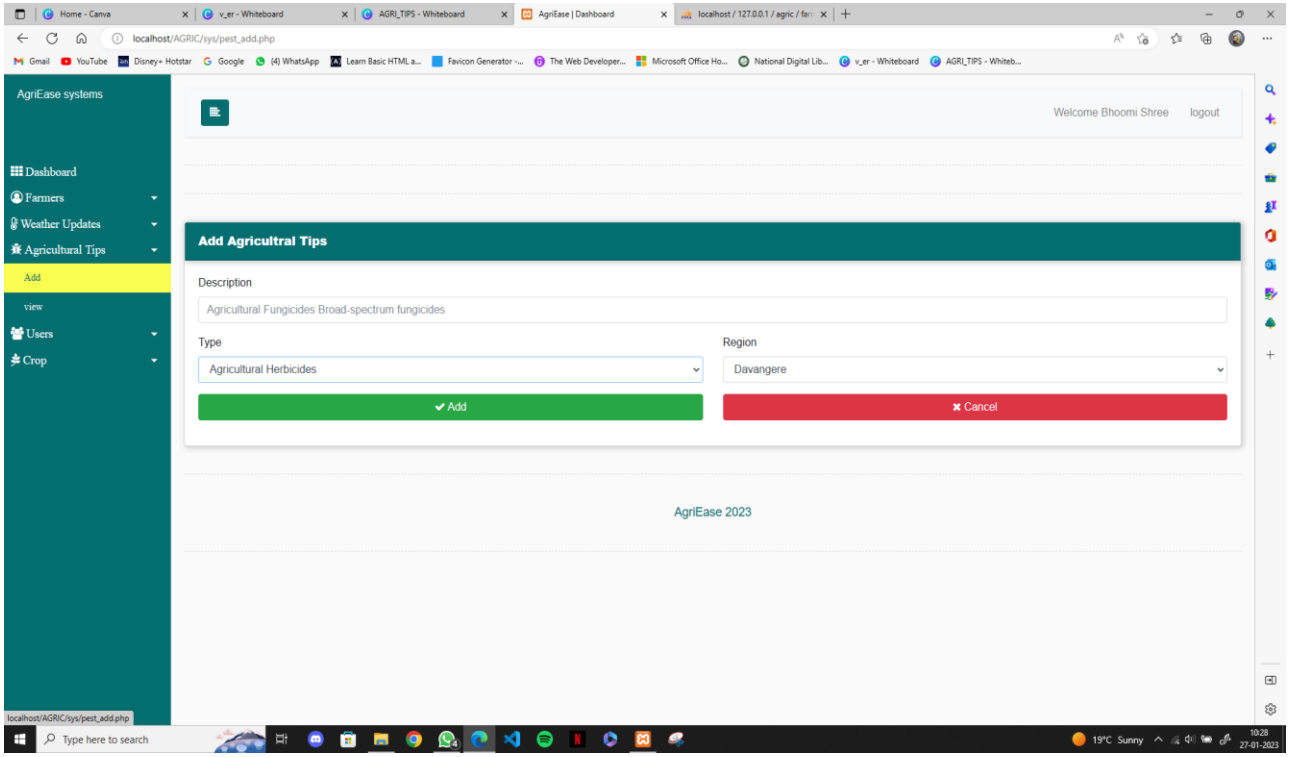


Fig 5.8: Add Agricultural Tips

9. View Agricultural Tips

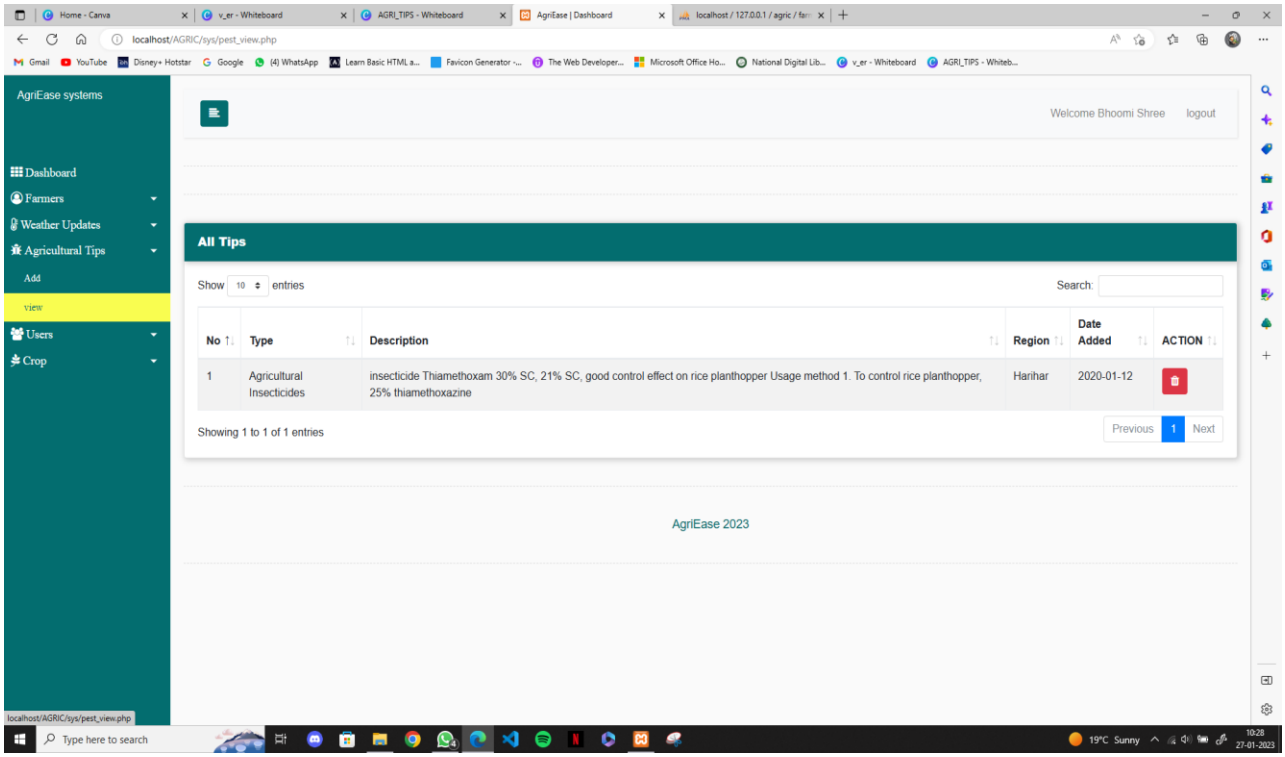


Fig 5.9: View Agricultural Tips

10.Add Users

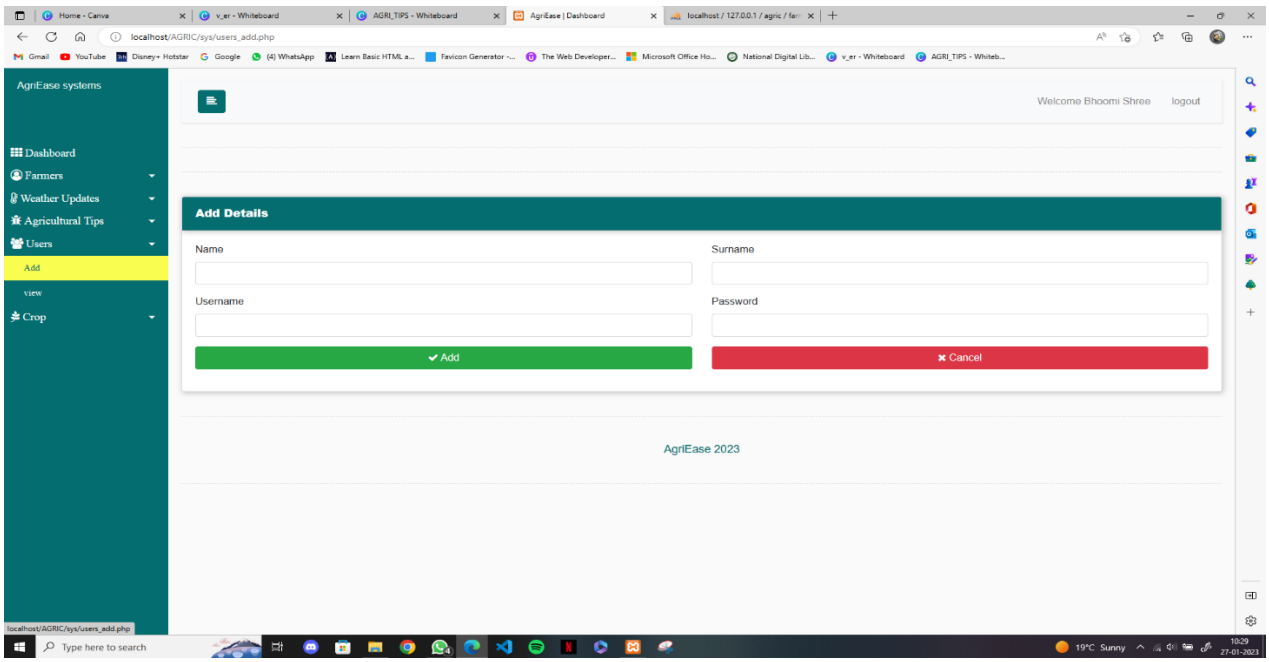


Fig 5.10: Add Users

11.View Users

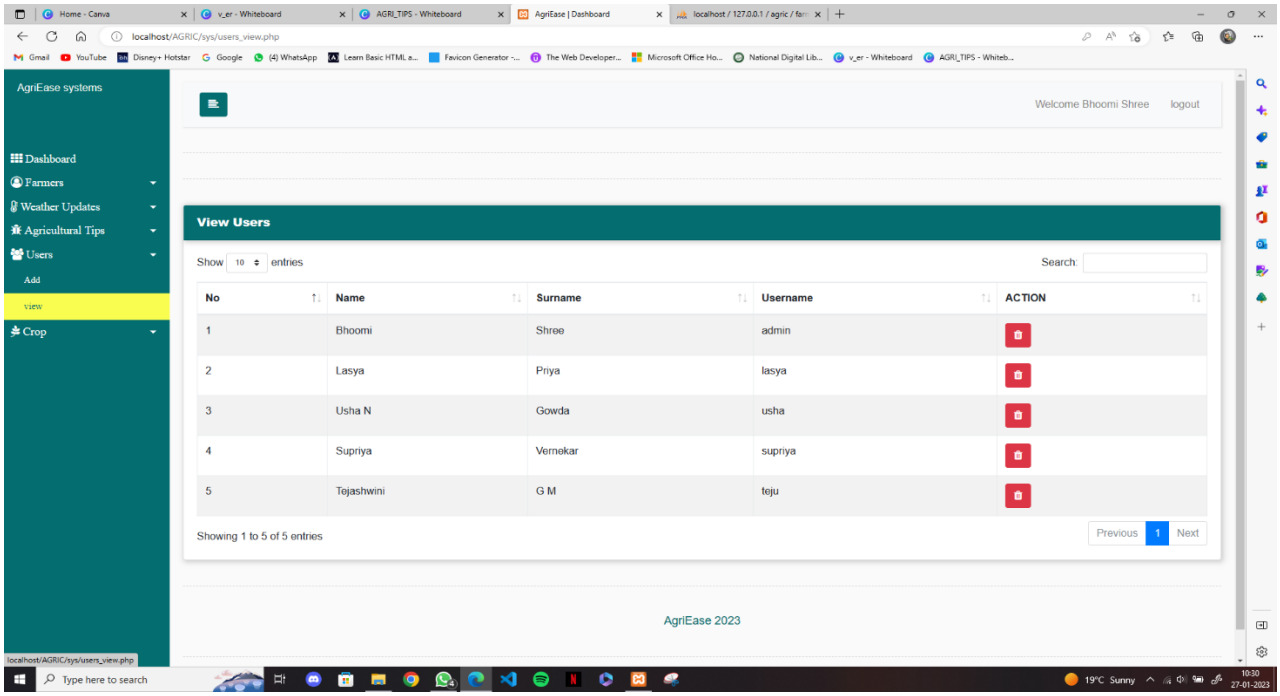


Fig 5.11: View Users

12.Add Crop

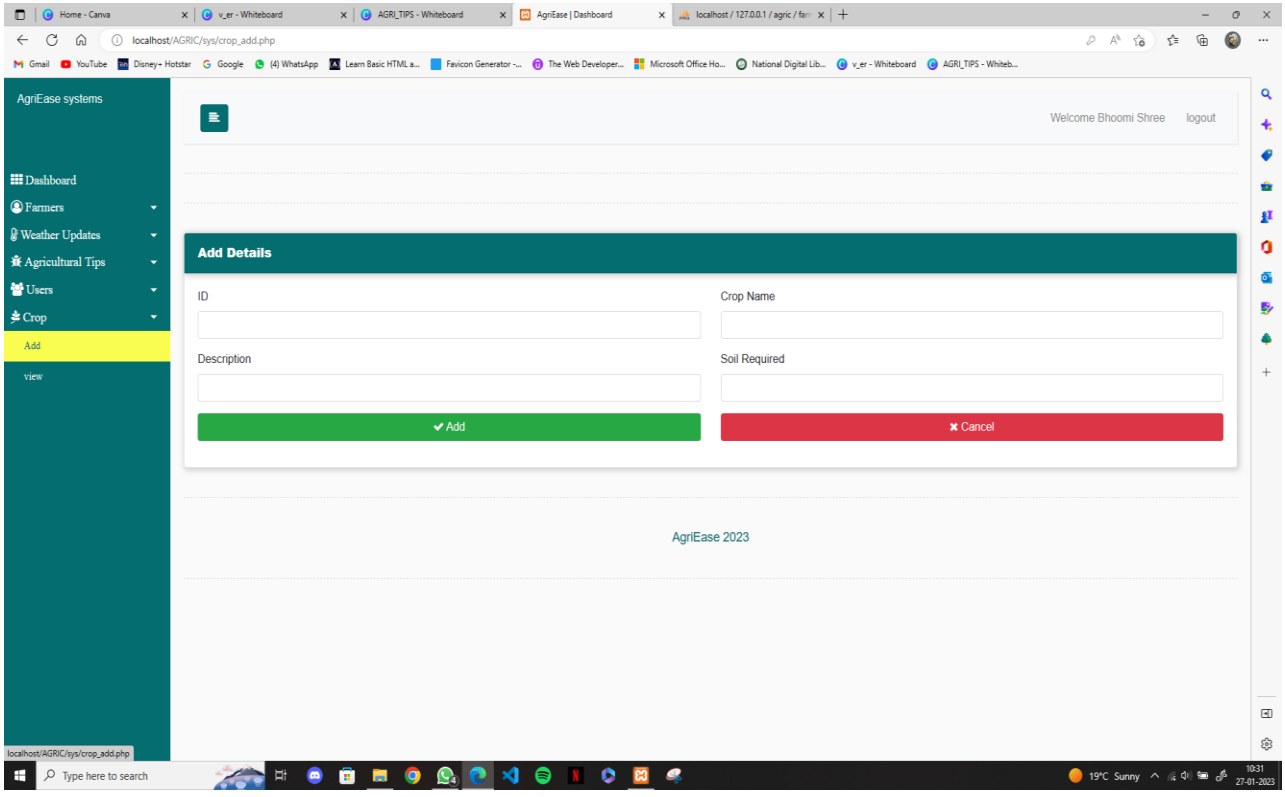


Fig 5.12: Add Crop

13.View Crops

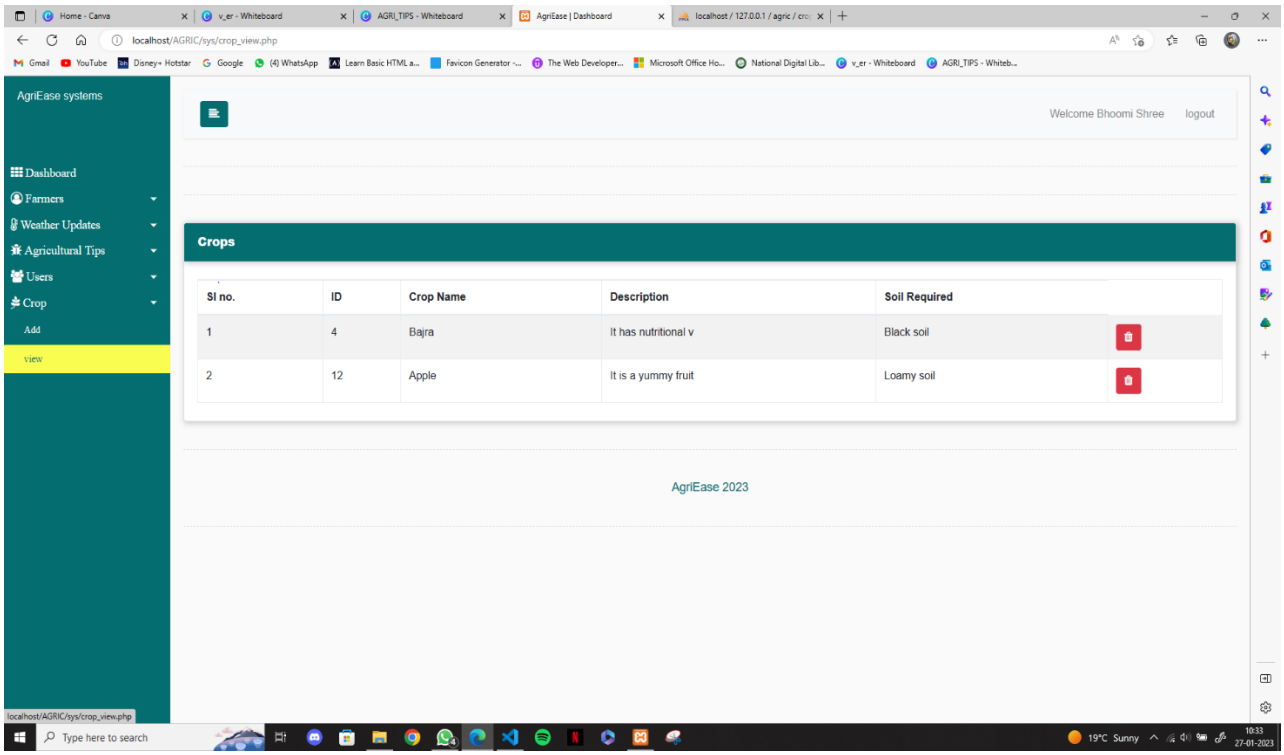


Fig 5.13: View Crops