

# PRD document:

## 1. Background

- **Project Name** : Crop Yield Estimation App
- **Target users** : Farmers, insurance companies, governments
- **Project goal** : To provide a user-friendly yield visualization interface and yield estimation function for target crop production areas

## 2. Functional Requirements

- **Crop Visualization** :
  - **Function description** : When the user selects the corresponding year and crop button, the map automatically zooms to the study area and displays the regional boundaries and crop type grid.
  - **User Story** : As a farmer and government official , I hope to use the **target crop type visualization** function to directly query the crop distribution in the area without complicated operations.
  - **Operating procedures** :
    1. The user opens the app and selects the year and crop type
    2. Click the query button
    3. The map automatically zooms to the study area and sets up map visualization by crop type
- **Production Query** :
  - **Function description** : Display crop yields based on the area of interest drawn by the user
  - **User Story** : As a farmer , I want this app to be able to count the crop yields on my own farmland
  - **Operating procedures** :
    1. User- selected regional-scale yield estimation mode
    2. Users mapped the extent of their farmland based on satellite maps

3. Users view production information in the information box

- **Estimated value :**

- **Function description :** Calculate the total value based on the statistical crop weight and unit price
- **User Story :** As an insurance company , I want to use the app to understand the potential yield of the farmer's future farmland to guide the loan amount.
- **Operating procedures :**
  1. model for insurance companies at user area scale
  2. Mapping the extent of all its farmland based on satellite maps
  3. Enter the unit price of the agricultural product or use the system default unit price
  4. Users view production information and total value in the information box

3. **Technical requirements**

- **Performance requirements :** User map dragging and zooming delay is less than 500 ms, and the response time for production query and value estimation is less than 2 seconds.

4. **Non-functional requirements**

- **User experience requirements :** simple interface, smooth response , intuitive operation
- **Interface design specifications :** follow GEE and general software design specifications to ensure consistency and aesthetics ;

5. **Acceptance Criteria**

- **Crop Visualization :** After the user selects the year and crop and clicks **the Visualize button**, the map accurately displays the location of the crop for that year, correctly zooming to the study area and boundaries
- **Yield query :** The application can respond quickly, in less than 2 seconds, and calculate the yield based on the crop type and drawn area selected by the user

- **Real-time image transmission** : response time for value estimation is less than 2 seconds, crop values are calculated correctly

## 6. Test Plan

- **Functional testing** : Perform separate tests on each function to ensure that the function is implemented as expected.
- **User testing** : Invite team members and instructors to conduct actual usage tests, collect feedback and optimize
- **Performance testing** : Test map dragging delay and function response time to ensure performance requirements are met