## Project Design Phase-II

## Solution Requirements (Functional & Non-functional)

| Date | 15 February 2026 |
|---|---|
| Team ID | LTVIP2026TMIDS91567 |
| Project Name | Rainfall Prediction System for Agriculture |
| Maximum Marks | 4 Marks |

**Functional Requirements:**

Following are the functional requirements of the proposed solution.

| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
|---|---|---|
| FR-1 | User Input Handling | User enters weather parameters (temperature, humidity, rainfall, pressure, wind speed, etc.) via web form. |
| FR-2 | Data Validation & Preprocessing | System validates inputs and applies scaling, encoding, and missing value imputation. |
| FR-3 | Rainfall Prediction | System uses trained Random Forest model to predict RainTomorrow outcome. |
| FR-4 | Probability Display | System displays rainfall probability percentage to the user. |
| FR-5 | Agricultural Advisory Generation | System dynamically renders advisory recommendations based on prediction result. |
| FR-6 | Model Management (Admin) | Administrator can retrain and update the ML model when new dataset is available |

**Non-functional Requirements:**

Following are the non-functional requirements of the proposed solution.

| FR No. | Non-Functional Requirement | Description |
|---|---|---|
| NFR-1 | **Usability** | The system must provide a simple, intuitive web interface accessible to farmers with minimal technical knowledge. |
| NFR-2 | **Security** | User inputs must be securely handled. Backend must prevent malicious inputs and ensure safe model execution. |
| NFR-3 | **Reliability** | The prediction system should consistently produce accurate results (Random Forest accuracy ~85.69%). |
| NFR-4 | **Performance** | System must generate predictions within a few seconds after form submission. |
| NFR-5 | **Availability** | Web application should be available whenever users access it, with minimal downtime. |
| NFR-6 | **Scalability** | System architecture should support integration with larger datasets or cloud deployment in the future. |