Project Design Phase-II

Solution Requirements (Functional & Non-functional)

Date	19 February 2026
Team ID	LTVIP2026TMIDS69093
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.