Definition Of Done

# Background

Smart Hydro has been a project that has been going on since 2023. Since then, as data is collected on the plants grown, what went right and wrong over the years, it subsequently affects the following years research. As of now (2025), below are things that need to be addressed before the team jumps into design, development and possible deployment of the project, as well as defining the new research.

## Definition of Done – Smart Roots Mobile Application with Hardware Integration

A user story, feature, or task shall be considered complete when all of the following conditions are satisfied:

### Mobile Application Functionality

* All functional requirements outlined in the user story are implemented and verified.
* The mobile application establishes reliable communication with hardware components (e.g., environmental sensors, irrigation controls).
* Core functionalities such as environmental monitoring, pest detection, and automated control systems are operational and validated in real-world conditions.
* Sensor data (including temperature, humidity, light, and nutrient levels) is correctly retrieved, displayed within the application, and persistently stored.

### Artificial Intelligence and Automation

* AI-based pest detection models are successfully integrated and tested, demonstrating acceptable levels of accuracy.
* Automated management responses (e.g., pest control actions, notifications) are triggered appropriately based on AI logic.
* Users can review AI-generated actions and retain the ability to override or approve them.

### User Interface and User Experience

* The user interface is implemented as per approved design mock-ups with responsive layouts adaptable to various screen sizes.
* The application demonstrates accessibility and ease of use for users of varying technical proficiency, including farmers.
* The user interface maintains visual consistency and adheres to established branding and theming guidelines.
* The application distinctly presents separate configurations for fruit/vegetable and fodder growth setups.

### Backend and API Integration

* All required backend APIs are integrated and functional, with successful communication between the mobile application and backend services.
* Data persistence mechanisms are implemented and verified.
* The backend architecture supports future scalability, particularly for tunnel system expansion.

### Data Communication and Reliability

* The application is capable of synchronizing data in environments with intermittent or limited internet connectivity.
* Data captured from the hardware is logged accurately and is retrievable for research and optimization purposes.
* Cloud integration (where applicable) supports both real-time and historical data analysis.

### Testing and Quality Assurance

* All defined acceptance criteria are satisfied, and associated test cases have passed.
* Manual and automated tests (unit, integration, and UI) are conducted and reviewed.
* Hardware interactions are validated under both laboratory and field conditions.
* Regression testing confirms continued functionality of previously implemented features.
* No critical or high-severity defects are present at the time of release.

### Deployment and CI/CD

* Continuous Integration and Continuous Deployment (CI/CD) pipelines are in place and function correctly (e.g., using GitHub Actions).
* The application builds successfully and can be installed on target Android devices, including lower-specification models.
* The release passes internal User Acceptance Testing (UAT) and is approved by designated stakeholders.

### Documentation

* Technical documentation, including architectural diagrams, API specifications, and setup guides, is complete and current.
* End-user documentation or a help manual is available for non-technical users, particularly farmers and other stakeholders.
* Code has been peer-reviewed, merged to the main branch, and adheres to the project's coding standards and style guidelines.

### Stakeholder Feedback and Approval

* Feedback has been obtained from relevant stakeholders and incorporated where feasible.
* The completed feature or release has been demonstrated and formally approved by the product owner, project supervisor, or equivalent authority.