



**NAVCDP**

NATIONAL AGRICULTURAL VALUE CHAIN  
DEVELOPMENT PROJECT

# SMART GREENHOUSE FOR TOMATO PRODUCTION





## Introduction

Agriculture has been revolutionized rapidly due to variabilities in climatic conditions. The ever changing weather conditions call for more innovative and resilient farming methods such as involving cutting edge technologies in extraction and interpretation of real-time data. The use of smart irrigation, precise nutrients application via fertigation, pests and diseases forecasting, real time data collection, data transmission to the server and data interpretation, guide in decision making system for the greenhouse farming. This has been triggered by the need for optimization of resources, saving on the cost of inputs and increasing the yield in a more climate smart and sustainable manner.

### **What is smart greenhouse?**

A greenhouse in which all the operations are automated to enhance efficiency and effectiveness in production systems. The control system is absolutely managed through a central platform.

### **Why Smart Greenhouse?**

1. Automate greenhouse system operations

2. To Save on the cost of input
3. To Enhance traceability
4. To Utilize potential of digital agriculture technology and infrastructure systems
5. To Enhance agriculture big-data farming through real time data flow
6. To increase Yield (by 30-50%)

## Methodology of Smart Greenhouse

- Construction of smart greenhouse
- Automation of greenhouse flaps and shade net
- Installation and synchronization of assorted sensors
- Creation of data base/Server Platform
- Calibration of sensors to collect several parameters
- Training of technical expert's end users
- Management of the platform and decision making support systems scaling up.



*Solar energy in smart greenhouse powers movement motors and sensors*



*Smart greenhouse with retractable shade net automated*



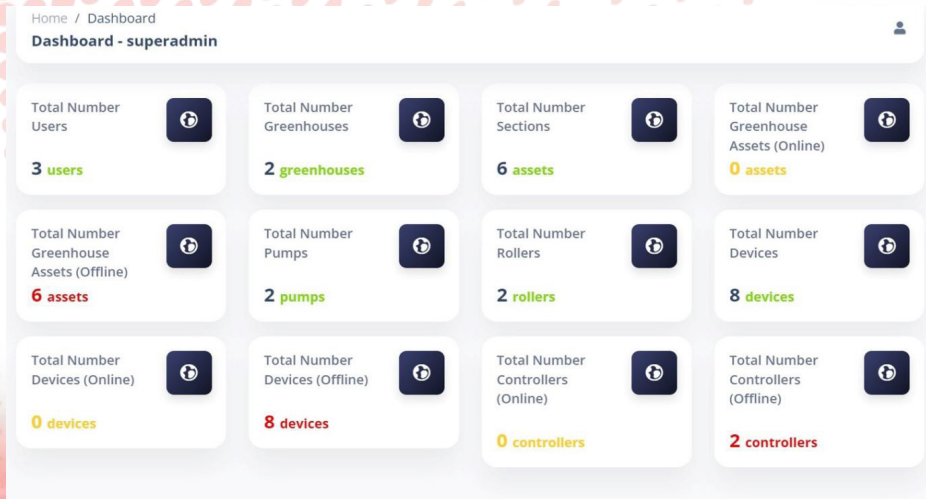
*Smartgreenhouse planting structure for tomato production with sensor box controller*



*Leaf wetness sensor installed to forecast fungal disease development stages on greenhouse tomatoes for decision making; whether to initiate treatment or prevention actions.*



*Fertigation chamber with sensor for irrigation and nutrient application*



*Internet of things and services linked to the data base/platform for commands and decision making*

- This technology enhances provision of input at the right time, reduces waste, saves on cost of input and increases quality yields.
- Additionally, real time transfer of data to servers is enhanced.
- Increased efficiency in decision making support system is realized
- Increased profitability in Peri- urban farming is attained
- Digital farming in reducing GHGs and climate smart solutions are enabled



*Smart greenhouse with hydroponic technology for tomato production*



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