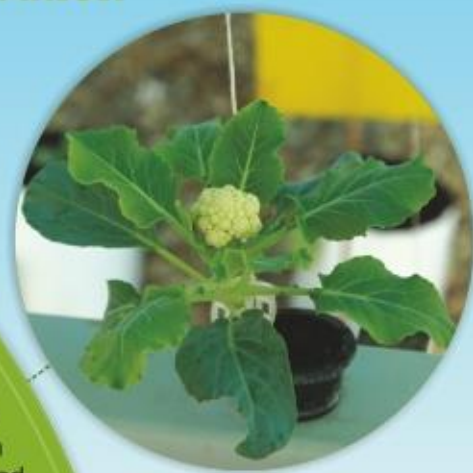


# Automated Hydroponics System

Enabling Soilless Cultivation



Hydroponics is a method of cultivation, where plants are grown in soilless media using water and nutrient mixture. It kindles a hope for food production in non-agricultural lands as well as in urban areas. In this system, water mixed with minerals and nutrients is exposed directly to the roots of the plant that can be supported by various media like coco-peat, perlite etc.

C-DAC, Mohali with support from MeitY, Govt. of India, has developed a Continuous Flow Automated Hydroponics System. It is installed at Dr. Y.S. Parmar University of Horticulture and Forestry, Nauni, Solan (HP). It has been successfully tested for production of lettuce, strawberry, Broccoli and Cauliflower.

## Hydroponics Advantages

A water efficient method of cultivation

Optimal use and reuse of nutrients and minerals

Freedom from Soil born diseases/infections/weeds/pests

Faster growth rate of crop than traditional farming

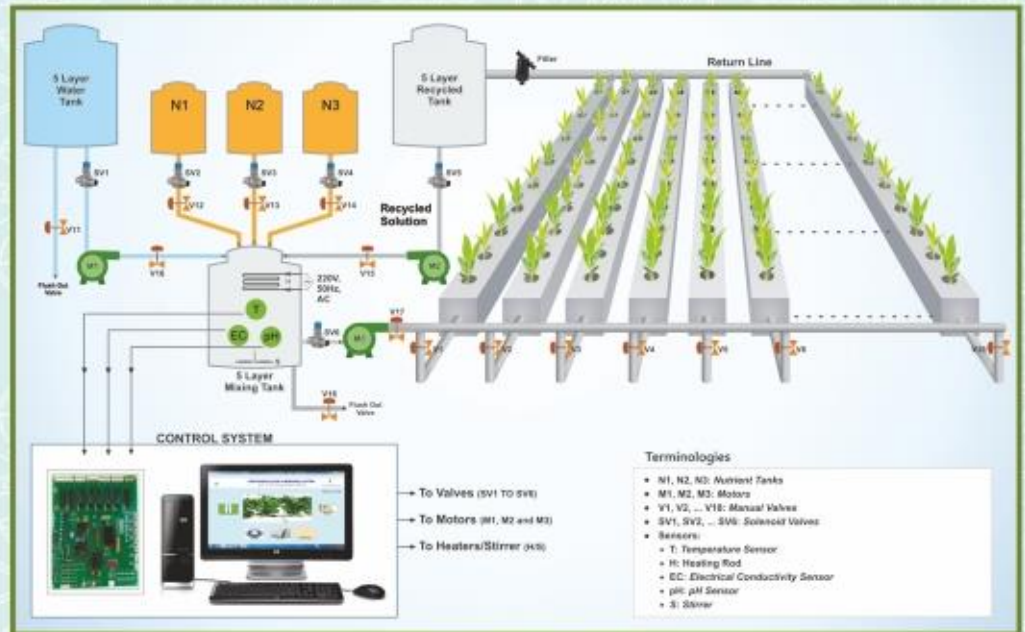
Amiable to cultivation in areas with water shortage or lacking soil-cover

Suitable for farming on ships/floating gardens, roof top farming in urban areas

A precursor to vertical farming



# Jalkrishi - The automated hydroponics system from C-DAC



Flow Diagram and Display of Automated Hydroponics System installed at Dr. Y. S. Parmar University of Horticulture & Forestry, Solan (H.P)

The installed system is a closed loop control system with graphical interface & programmability. It involves calculated flow of nutrients and water in a five layered mixing tank. The solution is pumped into the gullies where plants are grown with suitable supporting cups. The roots of the plants directly absorb water and minerals. Overflowing solution is collected in recycle tank and is pumped back to mixing tank for reuse. The temperature, pH and conductivity of the solution can be monitored simultaneously for control. The automation enables easy graphical user interface based programmable timing control and other monitoring of system. The system can be scaled as per requirement to add new features.

## Features of C-DAC Hydroponics System

- Indigenously developed low cost automated hydroponics system
- Continuous monitoring of solution temperature, pH and conductivity
- SMS Alerts/Query, Alarm, report generation and data logging with graphical representation
- User friendly touch screen based Graphical User Interface
- GUI based Programmable control parameters
- Crop based Management System
- Use of five layered tanks for mixing and water
- Remote monitoring using SMS

## System Specifications

- EC: 0.55 to 500,000  $\mu\text{S}/\text{cm} \pm 5$
- pH: 0 – 14 pH  $\pm 1$
- Temperature Monitoring
- 1 HP pumps for nutrient mix flow
- Poly-house Dim.: 15 x 7 x 4 meters (L x W x H)
- No. of Gullies installed: 16
- Inverter backup for power failure

### Designed and Developed By

Centre for Development of Advanced Computing (C-DAC), Mohali, Punjab  
In Collaboration with

Dr. Y. S. Parmar University of Horticulture and Forestry, Solan (H.P)

### Funded By

MeitY, New Delhi, Govt. of India

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