



Fablab – Vigyan Ashram

- At Fablab, we facilitate environment for people to put up their problems and identify solutions themselves.

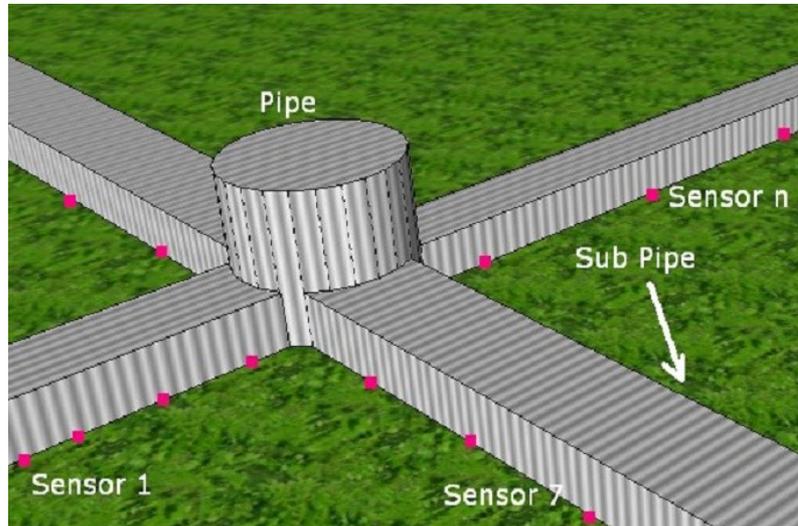
- Objective is to put technology at use to resolve life-problems.

By this we do not mean that Fablab is the only tool to identify and resolve problems!





Decentralised Drip Irrigation System



Project for – FAB-Academy 2011-12

Objective :-

Automated circulatory control system, for Drip Irrigation

Low Cost System, affordable to farmers for small farms

- Based on Sensory inputs, each Pipe is capable calculating the required quantity of a resource
- A central reservoir is informed accordingly
- This is a Selective Application process, in order to reduce the cost of resources and implementation

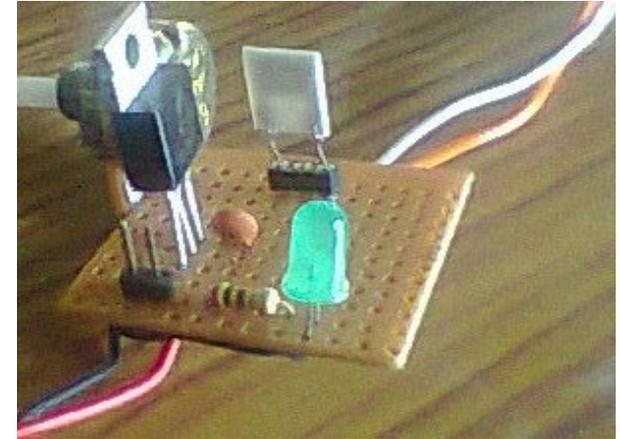


Leaf Wetness Duration Sensory System

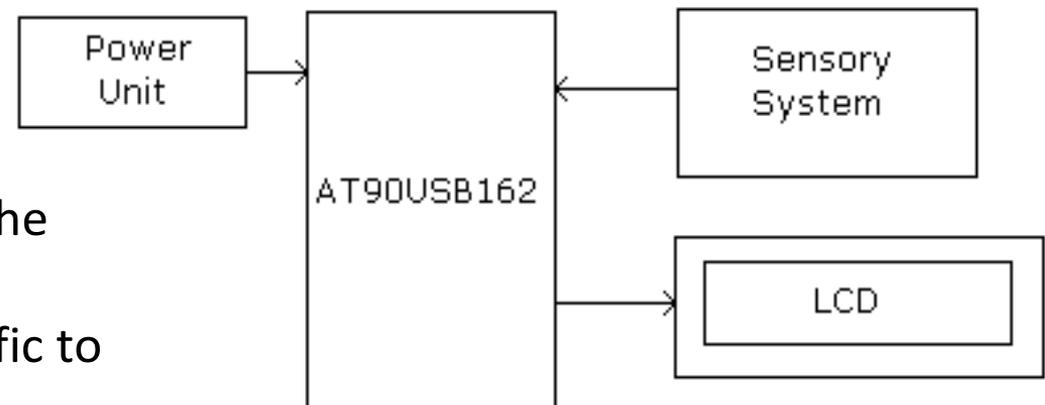
Project for - Fruit Growers

Objective :-

- Sense the dew & record the corresponding duration
- Dew formation for longer periods is an indication of ill-environment for some fruits
- Predict the time of disease



- Sensory System based upon a semiconductor substrate
- Customisable Sensitivity
- Peltier Effect being used to create the artificial dew conditions
- Development being done in C specific to AVR





Hearing Aid

- Based on simple Op-Amp
- Effective distance upto 1.5 ft
- Runs off a 9V battery
- Gain upto 101
- Cost upto 3 USD (against 75 USD on market)



Next – Complete and publish low power version, based on MCU/DSP

Our experience –

- Mr. Narhe, who is around 75 years old, used the device for 1.5 months.
- Acc/to him, the device has faded out his doubts about others talking, while he could not hear them out earlier!



Administration device



- A data logger in general, aimed at educational institutes, specifically.
- Applies appropriate and easy handling and address difficulties at remote schools
- Data (such as attendance record) can be sent to central server, over GPRS
- Protected by GPS, impacting in less possibility of misuse.

Next – Complete and publish low footprint version and packaging accordingly.



Solar Charger

- Powered by 12V, 2W Solar Panel
- Charges 3.7V (Li-ion) to 6V (Lead Acid) batteries
- Costs upto 8 USD
- Very much useful in Rural/Urban areas of India

Next – Prepare next version that is customisable and based on Low Dropout Voltage Regulator

While, an affordable device is in sight, we need to

- Contain the cost of solar Panels (which is 2.5USD/W in India)
- A set of charger designs is to be produced in order to make it business viable





LDR Based Light Control system

- Consumes less than 1.5W
- Adjustable sensitivity to the Sun Light
- To be delivered to Kendur Gram Panchayat



Water Pump Controller



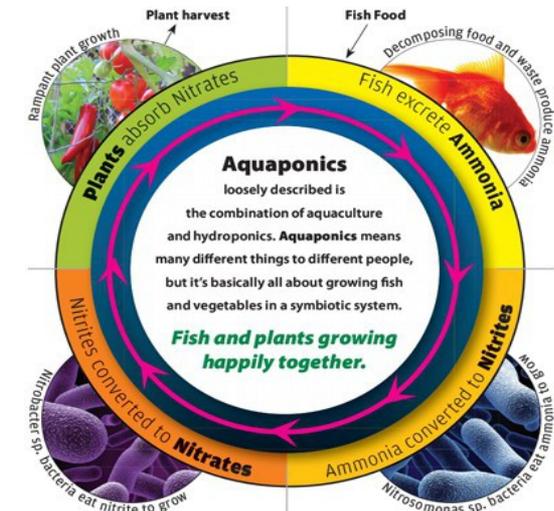
- An automated pump controller, based on a wire-pair
- Simplest sensory unit, supported by a transistor switch and relay
- Costs less than 1 USD
- Consumes 5V, 150mA maximum



Overall Overview - 2012

Aquaponics

- hydroponics (cultivation of plants without soil) + aquaculture (fish farming)
- Ammonia (NH_4) \rightarrow Nitrite (NO_2) \rightarrow Nitrate (NO_3)
- Self sustained system of crop & fish production
- about 90 % of the water and 100 % nutrients are recycled for organic crop production.

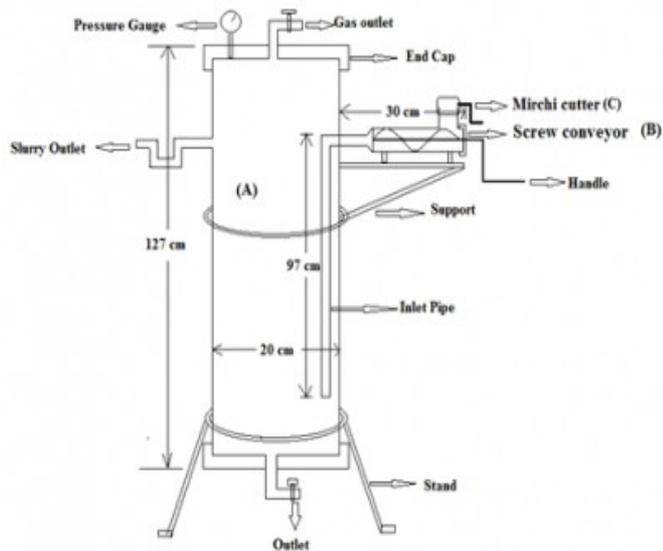




Kitchen Waste Biogas Unit

Feasibility tests were carried out for

- A design of low weight, small BioGas unit
- Suitability for a family of 4 members
- Capability to Run from Kitchen Waste



Biogas in PVC

Test Results -

- The gas burnt with blue flame for 6 to 8 min. after adding the feed in the biogas



Egg Incubator

- A small, commercial Unit
- Aimed at small enterprise units, in Villages
- Runs from 60W DC Source
- 85% results in Tests at lab (on Solar Power)
- Required environmental parameters are maintained using hot water
- Incorporates Humidity and Temperature Sensors



Currently - Testing

- with 500 eggs
- Capacity to switch over to different power sources (Grid, Inverter and Photovoltaic Panels)



Immediate and Long-term Tasks

1. Learn appropriate use of Fablab Machines – Laser Cutter, Vynyle Cutter and Milling Machine.
2. Understand the basic maintenance and repair work of machines.
3. Integrate Fablab with Vigyan Ashram's Overall efforts on educational systemic changes



Next - Focus on waste management at Fablab



Beyond Recycling



Overall Focus

Apart from occasional and focused situations we work upon, next year, focus will be on

- Expanding the Fablab sphere, by reaching out to more people (e.g. through Schools)
- Mastering on Effective Power Subunits to a given device (availability of Power being core issue)
- Creating a permanent documentation for Fablab operations

