Raincube White Paper

Summary
Create a retrofit system for residential houses that collects rainwater and automatically and intelligently irrigates backyard fruit and vegetable plants. The rainwater collected with use a solenoid pump, water flow sensor, and satellite weather data to regulate water delivery to different zones. Using Ethereum smart contracts, collected rainwater will accrue a digital value using a crowdfunded token system. Internal tokens can then be used to purchase food from the rainwater distributed gardening system.

Renovation Steps
Retrofit a backyard into an edible garden with

1. Lasagna mulching
2. Gutter Renovation
3. Rain Barrel Wrapping
4. Raised bed garden
5. Irrigation
6. Planting
7. Computer Setup
8. Test and monitor

Rain Barrel Conversion
275 Gallon IBC Tote. Wrap in black plastic. Stack two on top of each other or side by side. Use cinder blocks as stable platform. Vent air by creating a tube out of the bottom tote by installing a 1 inch pvc pipe.

Attach first flush system to downspout to remove any dirty water

Total Roof Area- 726 square ft
Yearly Water Catchment Volume- 26,000 gallons

BOM

Rainbarrel
Liquid Level Sensor $10.99
IBC tote $100
Superhead first flush- keeps debris out of rainbarrel
Black Plastic Sheeting to make IBC tote UV resistant. Cut 14ft to cover one tote.
Duct Tape

½ inch 24v battery operated ball valve

Gutters
Gutter Guard
First Flush

Brain
Arduino micro controller
Raspberry Pi
Wire Flags to designate irrigation lines and zones

Yard
Mulch
Amended Soil
Plastic Computer Box
½ inch main line 700 millimeter

Features
List accessible through home app dashboard

- water flow rate (over/under) normal usage
- Water quantity
- Water quality
- External Temp and rainfall. Pull in weather data from online and cross reference. Blossom as reference.
- Harvest times

Logic

Inputs: Rainfall Weather Data, Water volume in Raincube.

- If has not rained in last 24 hours, run watering cycle for (x) mins to zone 1 and zone 2.
- If water level is below 5 gallons, use garden hose to refill.

Food Production
What is the water requirement for a high food turnover? Calculate roof area and multiple by rainfall coefficient.

Irrigate on average 1 inch of water per week.

Fruit

Banana, mango, orange, lemon, avocado, goji

Vegetables

Zone 1 carrots, eggplants, tomatoes, pepper, onions, basil, cucumbers, basil

Zone 2 corn, beans, cucumbers, melons, parsley, peas, potatoes, pumpkin, squash.

Currency

Write a smart contract that creates a token system for water collected. Gamify water collection and usage to create community of exchange and services.

Rainwater Schedule

Feb 29 Rainwater Workshop
Mar 5 Install Day 1- Gutters and RainCube
Mar 12 Install Day 2- Irrigation and Raised Beds
Mar 19 Install Day 3- Planting and Computer Installation and Testing
Mar 26 Graduation Party

Weekly Office Hours at Greentech Meetup

Additional Resources

- Instructions for how to make a Wifi Water Valve using ESP8266. How to adapt for use with rainwater?
- Monthly planting schedule for Florida plants.
- American Water Consumption Habits from the LA Times. Americans use on average 100 gallons of water a day. Only need 13 gallons per day for basic needs.
- Estimated Water Use in the US Irrigation makes up 33% of water used in US.
- First Flush Diverter Kit from the Urban Farmer Store