

Data Driven Approach to Developing Solar Based Productive End Use Services



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Gham Power: Social Enterprise with Solar-based Solutions



Started in 2010



2 MW of Solar Deployed across 1,500+ Projects





A Common Challenge Faced by Nepali Farmers:

How will I irrigate my fields?

How much water can I afford to irrigate?

Given whatever water I can get, what should I grow?

In the absence of data, all this becomes expensive guesswork




Water sources like rivers drying up for longer spells



As a result...




High Cost of Irrigation forces Poor Crop Choices



Wells are dug deeper and deeper each year

This photograph shows the interior of a deep, circular well. The walls are made of rough, light-colored earth. Several long, dark-colored irrigation pipes are visible, extending from the top of the well down into the darkness. The pipes are bundled together and appear to be secured with some form of rope or tape. The lighting is dim, with a bright light source at the top creating a strong contrast.



Pumps run by generators 5 to 12 hrs / day (burning a litre of diesel / hour)

This photograph shows a generator pump system installed in a well. A red generator is connected to a pump unit, which is submerged in the water. A long, orange corrugated hose is connected to the pump. The surrounding area is dark and cluttered with debris, including a white plastic bag and some metal parts. The lighting is bright, highlighting the generator and the hose.

Rs. 250 (USD 2.50) per hour to use this pipe



Why?

Farmers



- Mostly unaware of solutions
- Even if aware, can't assess solution impact
- Poor access to financing -> can't afford solutions

Solution Provider



- Lacks detailed field data -> can't assess needs well -> oversizes systems
- High project development costs

Banks/MFI



- Poor data -> difficult to assess farming project risks
- Manual cash collection -> high loan servicing costs

Policy Makers



- Difficult to gauge the effect of interventions
- Difficult to track impact metrics

Solution: Off Grid Bazaar Platform

- Provides solar-powered farming solutions (e.g. water pumps) equipped with a smart meter
 - Tracks rich field-level data like electricity usage, water flow, ph, soil moisture, weather data
 - Integrated with mobile money
- Uses data + algorithms to optimize farming solutions and list them on platform as investment-ready projects
- Provides a market place for investors
 - Review project cost and benefits in detail
 - Automated cash collection lowers operational risk/costs
 - Automated monitoring -> transparent project performance

Solution: Off Grid Bazaar platform



70
Projects

\$3.5M
Investment

Login | Signup

All

Water Pump

Grinding Machine

Dairy Chilling

Refrigeration

Microgrid



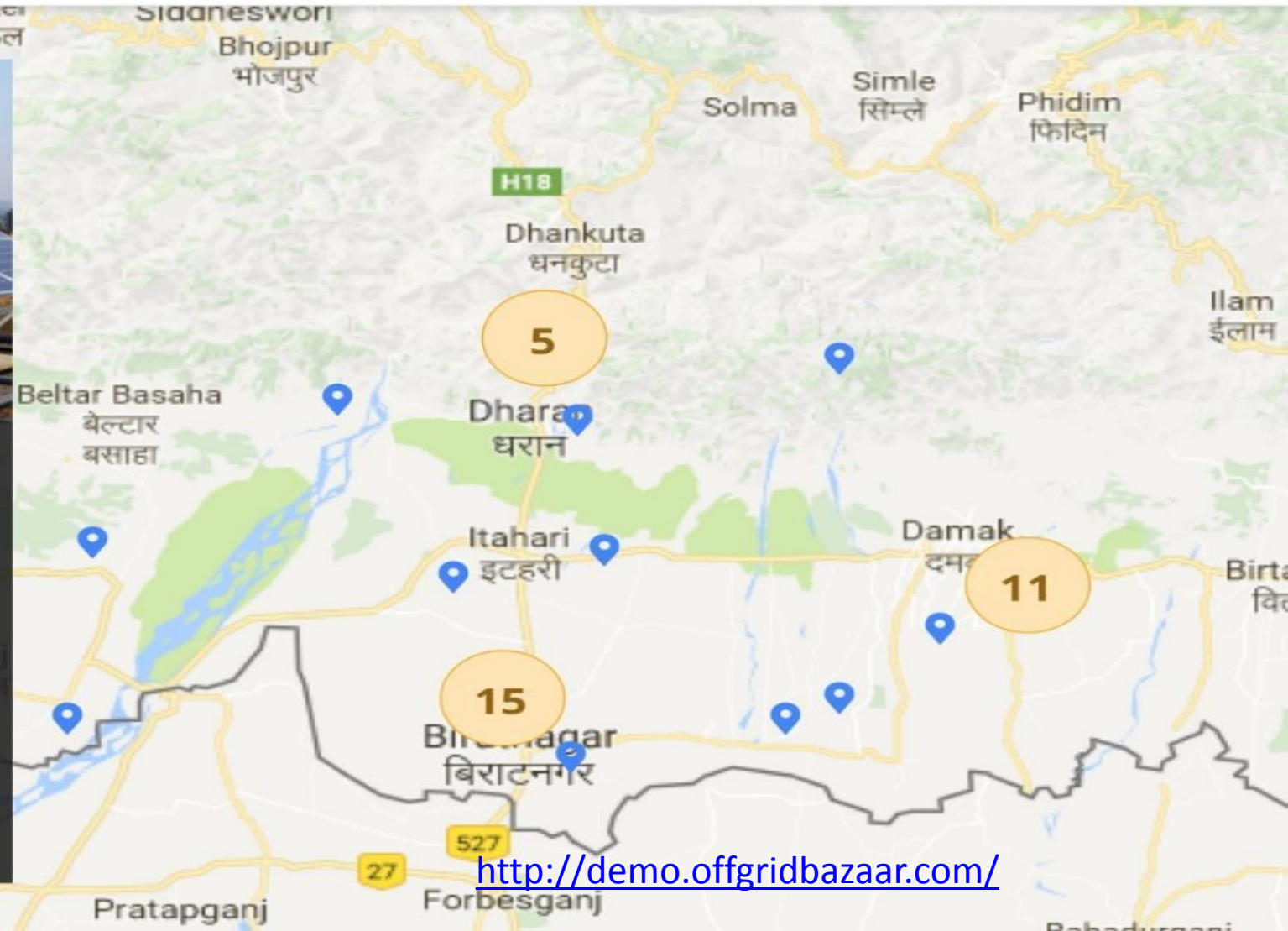
Invest in Off-Grid Solar

Register now to research, invest and bring power to the people.
Register now to research, invest and bring power to the people.
Register

LOGIN AS

INVESTOR

DEVELOPER

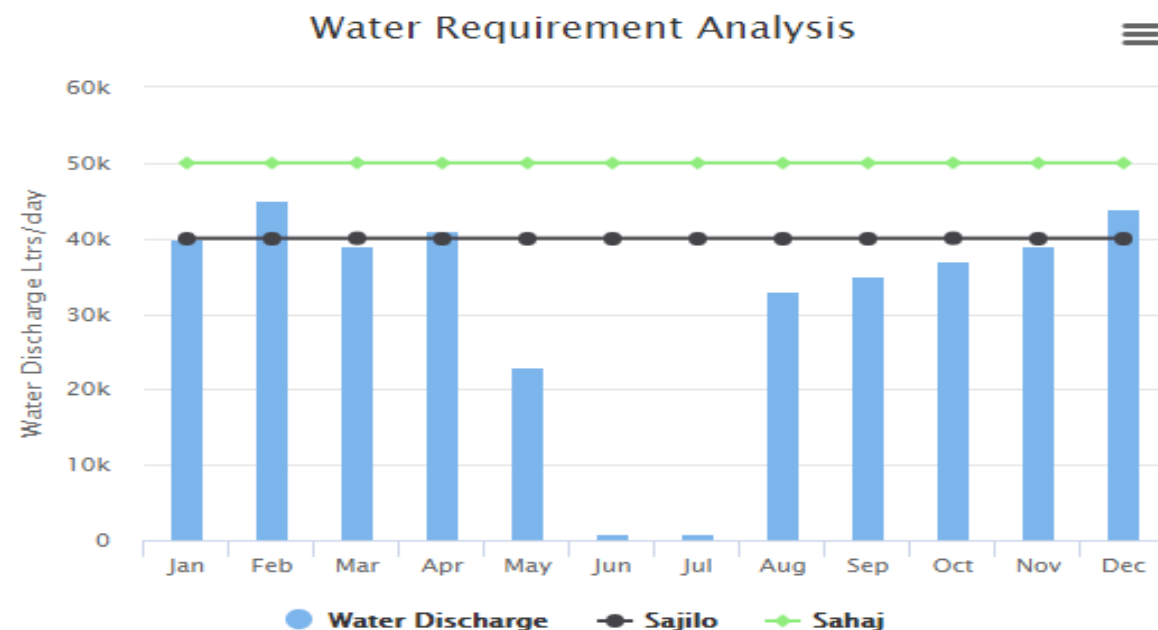


<http://demo.offgridbazaar.com/>

Solution: For Developers

Water Requirement Analysis

We analyzed water requirement for your crops throughout the year. Based on that, we suggest the following solar- powered water pumping solutions. Select the solution that best suits you.



Minibharts.com

PLAN 1

Sajilo

Daily Discharge 40,000 Ltrs per day

Solav PV Size 678W

Water Pump Size 1hp

\$2,025



PLAN 2

Sahaj

Daily Discharge 50,000 Ltrs per day

Solav PV Size 945W

Water Pump Size 1.5hp

\$3,600

PLAN 3

Bishesh

Daily Discharge 75,000 Ltrs per day

Solav PV Size 1,350W

Water Pump Size 2hp

\$5,000

SUBMIT FOR FINANCING

GO BACK AND UPDATE INFO

CANCEL

Solution: For Financial institutions



\$5,255

Net Annual Income

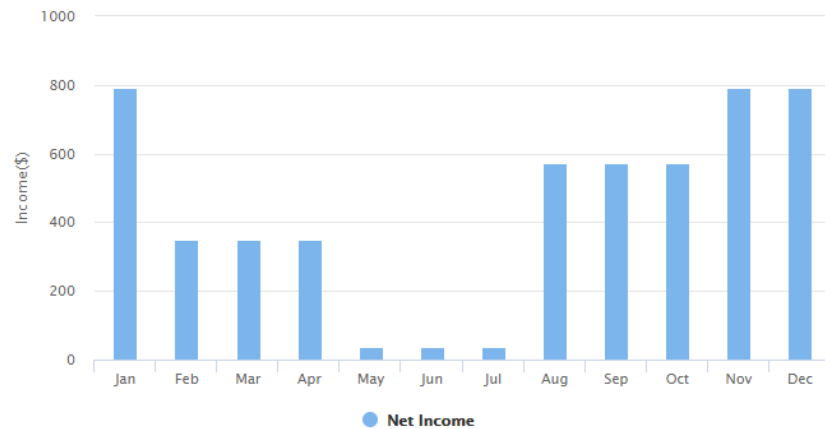


225%

Projected 3-year ROI

Net Income Projection

Monthly Net Income Projection



Highcharts.com

Impact Map

Impact

Metrics

Diesel Displaced

0.1 KL/year

CO₂ Curbed

1.1 Tons/year

Households Served

5

Businesses Served

1

Jobs Impacted

5

Lives Impacted

50

Express your Interest to Fund

This project is looking for bank loans, grants/subsidies, and equity investment.

Select the amount or percentage you are interested to invest, and your desired investment terms. You can also contact the project developer to get more information about the project.

In Percentage

In Amount

Percentage

%

Solution: For Policy makers



\$2,450

Repaid



3,431 kl

Water Discharged

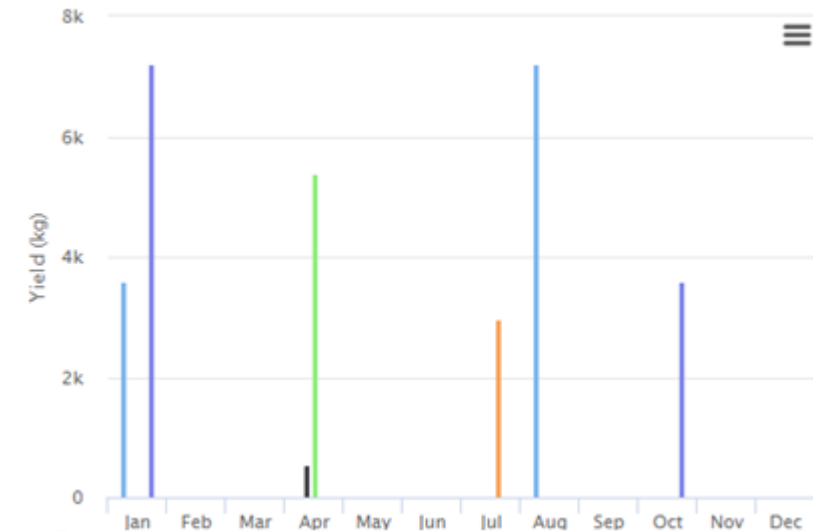


2,232 KWh

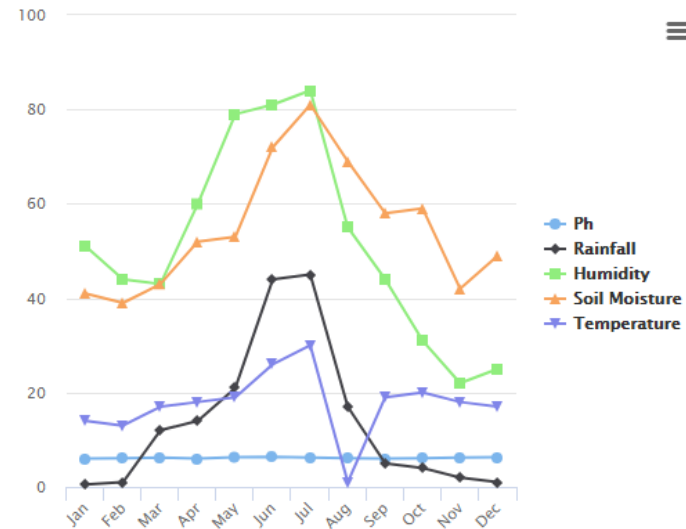
Solar Energy Used

yield(kg/ha)	Crop	yield month
10,800	Tomato	Jan/Sep
10,800	Cauliflower	Jan/Oct
540	Small Grains	Apr
5,400	Cucumber	Apr
2,970	Maize	Jul

Crop yield prediction



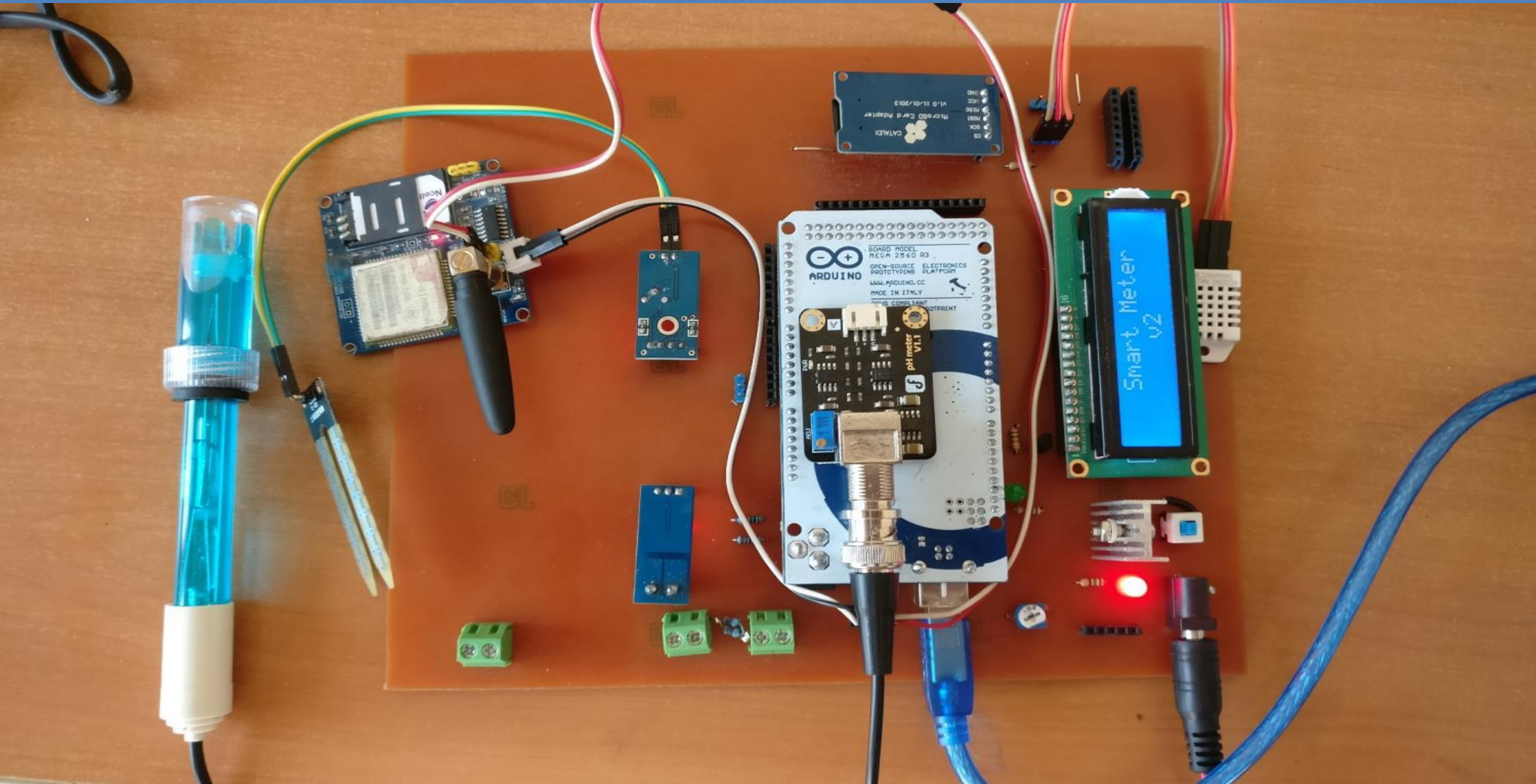
Environmental Variables Trend



Highcharts.com

Month	Temp °C	Humidity %	pH	Rainfall mm	Soil Moisture %
Jan	14	51	6	0.5	41
Feb	13	44	6.1	1	39
Mar	17	43	6.2	12	43
Apr	18	60	6	14	52
May	19	79	6.3	21	53
Jun	26	81	6.4	44	72
Jul	30	84	6.2	45	81
Aug	21	55	6.1	17	69
Sept	19	44	6	5	58
Oct	20	31	6.1	4	59
Nov	18	22	6.2	2	42
Dec	17	25	6.3	1	49

Solution: Smart Meter Tracks Comprehensive Field Data



With Off Grid Bazaar Platform:

Farmers



- Can identify optimal farming solutions suggested by scientific data analysis
- Get access to finance
- Can assess solution impact by tracking field data

Solution Provider



- Can identify investment-ready projects with data + analysis
- Reduces development costs by aggregating projects on platform
- Can track project performance

Banks/MFI



- Can identify and invest in high potential projects based on real data
- Reduces loan servicing costs with automated payment collection
- Can accurately track impact

Policy Makers



- Enables spatial targeting of programmes
- Can use field-level data to track performance of systems operational in the field and develop new policies



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Thanks!

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