

Helping farmers earn revenue with agro-processing systems

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Gham Power: Social Enterprise with Solar-based Solutions



2.5 MW of Solar Deployed across 2,000+ Projects



Learnings from past work

- Revenue distribution– Businesses need to generate a bulk of them
- Capacity factor – High latent time in earlier months, underutilized capacity during earlier months hurts profitability
- Expensive project development
- Seasonality of revenue – If anchor loads are seasonal, revenue is not certain

Identified paths to scale

- Standardize project development process
- Data driven process
- Business first, but focus on standalone systems
- Quantify increase in revenue to the farmer (increased revenue over displaced cost)
- Facilitate cross-sectoral collaboration
- Phased wise approach ?

Operation process

1. Project Creation



Our agents survey communities and create projects online based on farmer's data.

2. Project Design



Our algorithm uses the data for technical sizing, estimation of cash flow and credit risk assessment of the farmers.

3. Project Pooling



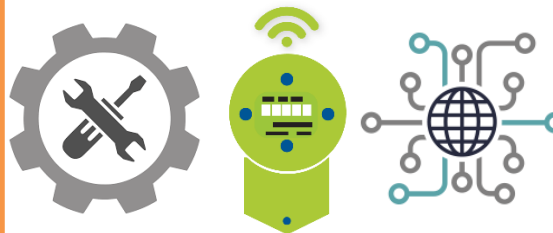
Several projects will be pooled into a SPV based on returns, risk profile, end-uses, implementation partners, geography, capital structure, etc.

4. Project Funding



The projects will then be presented to investment commitments from different private and public funds.

5. Installation



Gham Power / EPC partners install & commission the pumping systems with mobile-money enabled smart-meters and test remote monitoring/data retrieval.

6. Monitoring & Knowledge Management



The could dashboard enables regular monitoring of the systems, and collects operational data from each farmers, which will be analyzed to predict yield, recommend best practices, etc.

Off Grid Bazaar

Create new project

Fill in the information about the project below.

Farmer's Details

Name of the Farmer *

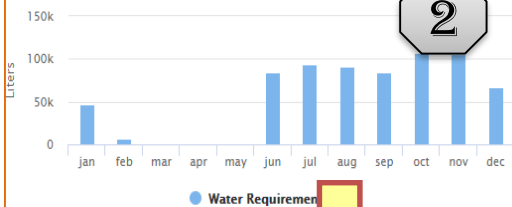
Farmer Name

Address *

Enter address

1

Water Requirement Analysis



2

Rajendra Sharma

Kalalya, Kalalya, Province No. 5

Project Developed by Bijay Kaldhan (Contact)

Rs. 24341

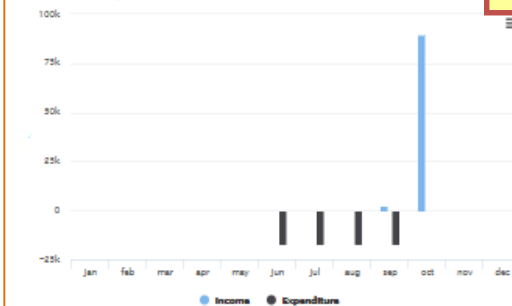
N/A

Net Annual Income

Projected 3-year ROI

3

Net Income Projection



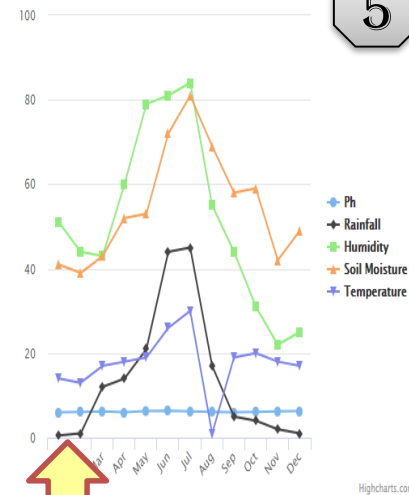
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Off Grid Bazaar
Invest in Off Grid Funds with Confidence

All Water Pump Grinding Mill



Environmental Variables Trend



5

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

Crop yield prediction



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Step 1: Power Productive End Usage (PEU)

Combine solar + appliance to enable income generation



Grinding Mills



Solar Refrigeration

Cold Storage /Dairy

- Identify sites with high potential to run profitable agro-businesses
- Pumps, Mills, and Cold Storage



Water Pumps

Price: \$2k - \$10k

Size: ~3 kW

Implementation time: 1-2 weeks



Step 2: Extend to Microgrids

Partner with PEU owners to power others in community

Price: \$50k

Size: Microgrid (~10kw)

Implementation Time: 1-3 months

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- Develop projects with PEU owners as partners (PEU as “Anchor Load”)
 - Centralized system serving 20+ households
 - Lights + mobile charging (\$2/month)
 - Optional: DC fan, TV, small fridge
 - Facilitate financing from private investors, banks, and grant funds
 - Asset management related services
 - Mobile payments / prepaid meters
 - Remote monitoring
 - Technical support and maintenance

What have we done so far ?

- Technological innovations
 - Smart meters w/ agri sensors w/mob money
- Access to finance
 - Established partnerships with the banks
 - provided buy-back guarantee
 - Raised grants for 60 projects for 30% of the project cost
- Distribution channel
 - Recruited 10 agents (sales commission)
 - Training installers
- Access to agricultural data
 - Created database of weather data, farmer's data
 - Algorithms to design project sizes/sort projects

Off Grid Bazaar: Future Directions

- Have deployed 60 projects ~ \$160k in the dashboard
- What do we hope to learn from the initial batch of projects?
 - Establish a baseline to understand farmer's yield and revenue
 - Agent retention strategies
 - Farmer's usage patterns and seasonality
 - Data to improve predictive algorithms
 - Optimum way to blend private and philanthropic capital to minimize risk
- Attract other developers and agents to develop PEU projects
 - More than 2.1 million small holder farmers
 - >\$300m market only for PEU's
- Gham Power's focus: develop large asset classes and invite other EPC's for implementation
 - 2018-19 Goal: \$800k asset under management

Thank You!



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