

# Financing Solar Minigrids:

A developer's perspective on needs and challenges of unlocking capital

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# Gham Power: Social Enterprise with Solar-Powered Solutions



Started in  
2010

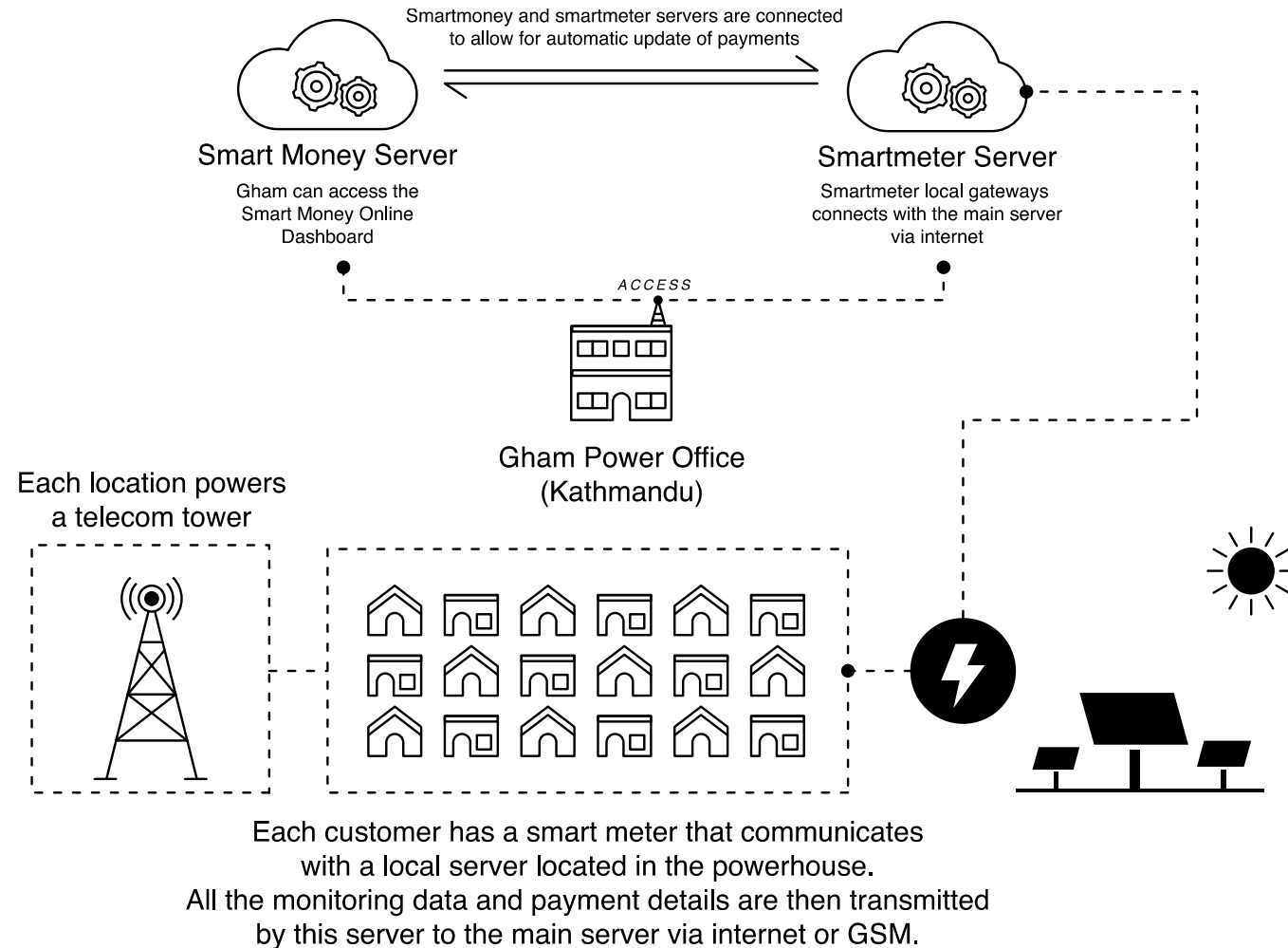


2.5 MW of Solar Deployed across 2,000+ Projects



# We started developing microgrids in 2013 with some key design criteria

- Co-own microgrid with local community
- Fund partially using commercial debt
- Develop a single asset class for commercial investment by bundling several microgrids together
- Use of anchor tenants – Ncell first mobile operator in Nepal who signed a Power Purchase Agreement (PPA) with a solar microgrid
- Use pre-paid metering to collect operational data + revenue collection using mobile money



## Deploying 100+ kW over 10+ microgrids resulted in immediate learnings

- Revenue distribution– Bulk of microgrid revenue comes from local businesses and microenterprises (e.g. farmers, tea-shops, eateries, lodges)
- Capacity factor in earlier months hurts profitability – High latent time and underutilized capacity
- Project development is expensive given the size of project
- Seasonality of revenue – If anchor loads are seasonal, revenue is not certain
- Pairing energy with appliances (e.g. tourism /agriculture) provides more stable revenue

As a result, we modified our model to focus on two  
most investment-ready asset classes

# Asset Class 1: Microgrids in trekking trails

Price: \$50k

Size: Microgrid (~10-15 kw)

Implementation Time: 1-3 months

Bundle 3 or more in a SPV

- Regions that can attract cash
- Focus on tourism/pilgrimage sites
- Develop energy infrastructure & capacity

# Trekking trails help diversify revenue streams

- Shops/organizations provide services / generate revenue
- Manage fluctuations/seasonality and diversify revenue

Communication



Telemedicine



Water-pumping



# Investors have begun committing funds for trekking trail microgrids

## Objective

Fund Raising program for 20 microgrids along scenic trekking trails

## Program

One week cycling challenge- Annapurna Base Camp

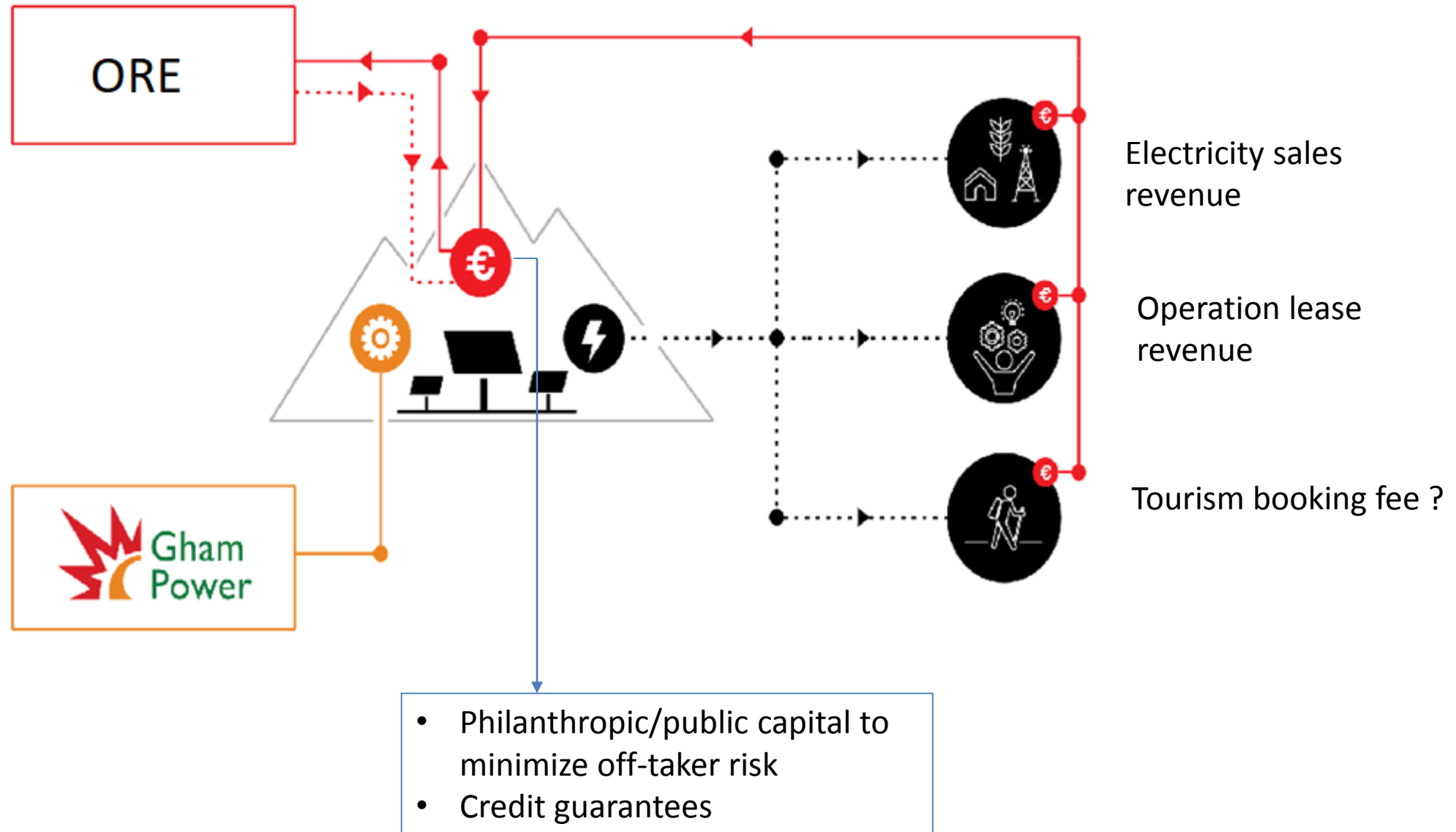
## Result

Created a fund with 1<sup>st</sup> tranche committed -> Off-grid Renewable Energy (ORE) Fund





# ORE mixes private capital with public funds and credit guarantees



# Asset class 2: Power Agro-Processing

Combine solar + appliance to increase farming income



Grinding Mills

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



Solar Refrigeration



Water Pumps

Price: \$2k - \$10k

Size: ~3 kW

Implementation time: 1-2 weeks



Cold Storage /Dairy

# Agro-processing: Faster development, shorter financing term reduces risks

- Higher margins (low development cost, financing term of 3 years)
- Minimize chances to go wrong if businesses don't start as projected
- Demand side management possible
- No latent time for microgrid cashflow
- Phase wise approach possible

# Deployment model

## 1. Project Creation



## 2. Project Design



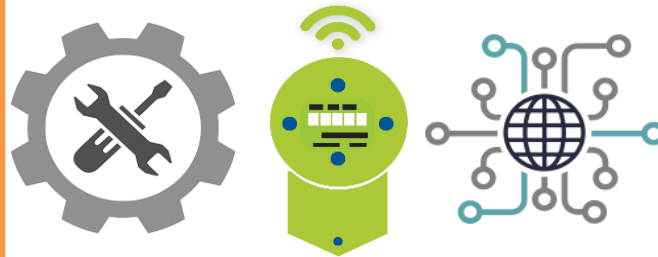
## 3. Project Pooling



## 4. Project Funding



## 5. Installation



## 6. Monitoring & Knowledge Management



# We developed online platform to enable crowd-funding grants that help securitize private investments into projects

5 Kl 55 tons 3/5

### Vegetable Farm

Dhangadhi 3.3Kw

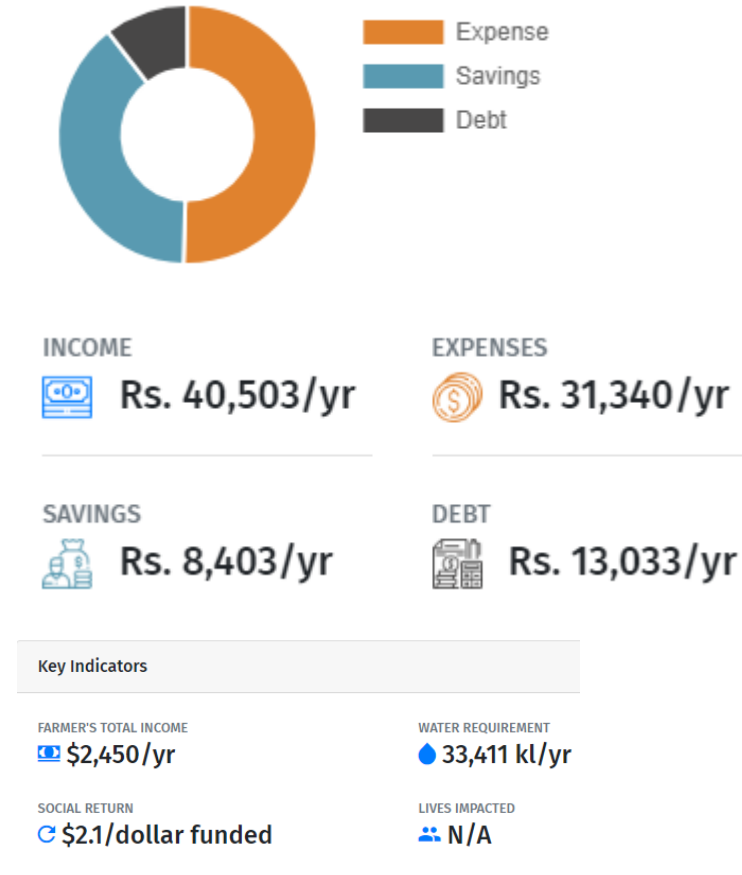
Help Harka install solar water pump in Janakpur so that he can grow tomatoes to support his family.

Funds required **\$5,400** Raised **\$3,700**

[View Details](#) [Share](#)

↑

*Projects are marketed on the online platform*



↑

*Key metrics are automatically generated*

Help Harka install solar water pump in Janakpur so that he can grow tomatoes to support his family.

**This project is 70% funded.**

You can invest full remaining amount or select your preferred amount below.

Total pledged **\$5,400** Amount raised **\$3,700**

[+ Invest in this project](#)

or, select your preferred amount

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↑

*Up-to 30% of project cost raised as grants*

## Next Steps / How you can help

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- We are
  - Securing investments through credit guarantees/insurance
  - Seeking concessional finance to test out early batch of projects; establish WTP
  - Attracting other developers and agents to develop Agro-processing projects
    - More than 2.1 million small holder farmers
    - >\$300m market only for Agro-processing
- Our target: Develop and deploy \$20 million worth of projects in 5 years
- Need help spreading the word to more grant foundations and impact investors (both debt and equity)

Thanks!



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