

Powering Agriculture : Affordable & Reliable Solar Water Pumping for Irrigation (Intervention & Up scaling)



*Avishek Malla
President
SunFarmer Nepal*



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ENERGY FOR ALL



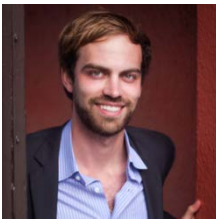
Company History



- SunFarmer's regional Kathmandu office opened in **March 2014** and is staffed by a team of leading solar engineers
- Our team has been involved in over **1,000 solar projects worldwide**, worth over **\$1 billion**
- SunFarmer Nepal has led **over 100 projects in Nepal**, primarily in health, education, agriculture, and business



- SunFarmer is **backed by SunEdison**, the largest solar energy company in the world and **Y Combinator**, a leading investor in Silicon Valley
- We draw on solar expertise of SunEd's ~4,000 staff



- Experienced management team with over \$150M in closed solar energy financings.
- Creative engineering team responsible for many "firsts" in Nepal, and design of proprietary remote monitoring system.



Business Model :

Motivation for Solar-Powered Irrigation

1. 60%* of farmers report insufficiency of own produce for household consumption for 4-9 months in a year.
2. < 5%* of farmers has access to pump technology for irrigation using one of the following solutions:
 - **Electric pumps** unreliable grid
 - **Diesel pumps** unpredictable supply and price , High Maintenance

*(National Census of Agriculture, Dec 2013)



Business Model

Barriers to Solar Water Pumping

- Low volume market (Hardware cost is high) 75 SWP in last decade
- Highly subsidy-driven market, not commercial
- Financial risk (cost of capital is high >18%)
- Proven market worldwide – Nepal Technological risk
- User Awareness for Technology adoption



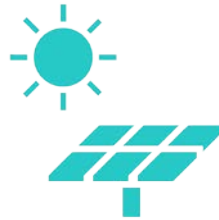
Business Model



**SF Provides
consultation,
carries out
Site Audit &
Design**



**Farmer(s)*
Signs Water
Purchase
Agreement**



**SF builds
quality SWP
System**



**Farmer(s)
make monthly
payments**



**SF continues to
monitor and
maintain the
system.**



**After 5 years the system is yours.
SF can continue to provide O&M service for a fee**

***Individual or Group of Farmers**



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Business Model



Progress To-Date

- **Piloted 4 systems under the Business Model proposed herein (1 group , 3 individuals)**
- **Projects <2 month old – 100% collection efficiency**

Learnings

- Diesel user / irrigation unreliable – Farmers Motivation
- Cost reduction
- Educate farmers – solar pumping is different to diesel
- Training / awareness through demonstration for adoption (heavy lifting initial activity)
- Impact is seen immediately



Business Model

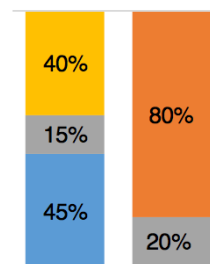
	Piloting Stage	Up Scaling
Awareness / promotion program	High	Moderate
Development cost	High	Low
Cost of Hardware	High	Decreased
Availability of Financing	Low	High
Technology Adoption	Low	High
Operational Overhead	High	Low
Initial setup cost	High	None



Business Model

	# of Projects	Project Cost (\$)*	Subsidy (%)	SF Investment (%)	Bank Financed (%)	Customer Down Payment (%)	Cost of Investment (%)	Financing Period	Avg. Farmer Pmt. (\$/mo.)
Phase 1 - Initial Rollout	50	200	40%	45%	0%	15%	8%	3 years	47
Phase 2 - Volume	200	640	30%	10%	45%	15%	8%	3 years	45
Phase 3 - Volume w/ Financing	1,000	3,200	0%	5%	80%	15%	8%	5 years	42

Project Cost Breakdown



Pilot Phase Scaled Phase

*In 000'
IRR to SF 16%



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Thank You

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