



Business Model of Solar Irrigation System in West Bengal

SwitchON Foundation is a not-for-profit social enterprise working on promoting solar pumps access among small and marginal farmers, since last ten years. As of 2021, **hundreds of solar pumps** have been installed and more than **10000 lives have been impacted** through this initiative. The organization has championed a First Loss Default Guarantee model that minimises the credit risk. We have partnered with some renowned public and private sector banks like **Punjab National Bank, RBL Bank and Axis Bank** to unlock end-user financing.



The solar pumps installed by SwitchON Foundation has significantly transformed the lives of the farmers through:



1.6X increase in income of the farmer



An additional source of income due to water selling



Average of 34,000 INR reduction of recurring cost per year



Diversification of up to 5 crops- resulting in additional income



Sonali Biswas is one such farmer from Hooghly district in West Bengal, who has benefited tremendously from using solar pumps. Previously, she used to grow paddy during summer and monsoon, and potato during winter in 1.5 acres of land. With reliable and affordable irrigation, she is now able to irrigate her entire 2 acre land and undertake multi-cropping instead of mono cropping. Currently, she grows diverse crops like bottle gourd, ridge gourd, flowers and pointed gourd during summer. This has **generated a 61% rise in her income from agriculture**. Now she is able to sell water to **2 acres of land as against 1 acre of land previously**, this has resulted in **113% rise in her revenue from water selling**. Her quality of life has improved as she has upgraded from **kutchha (raw mud) to pucca (cemented) house**. She is also saving on diesel and her Return on Investment is projected to be 87% in 1 year and her Debt Service Coverage Ratio will be 6.1. This indicates that shifting to solar is a very profitable venture for her. The entire calculation is done on the basis of **60% subsidy**.

87%

Return on Investment (ROI)
(in 1 year)



64%

Rise in Revenue



₹ 8745
EMI



6.1

Debt Service
Coverage Ratio



Return on Investment Analysis

Landholding **2 acres**

Pump Size **5 HP** Subsidy **60%**

+	YEAR 1 (Pre-Solar Water Pump)			Total Earnings in 1 year	YEAR 2 (Post-Solar Water Pump)				Total Earnings in 1 year
	Summer (3 months)	Monsoon (3 months)	Winter (3 months)		Season 1 (3 months)	Season 2 (3 months)	Season 3 (3 months)	Quarter 4	
Farmer Profit and Loss Statement									
Crop 1	Paddy	Paddy	Potato		Ridge gourd, Bottle Gourd, Pointed Gourd, Flower	Paddy	Potato		
Total irrigated land	1.50	1.5	1.50		2.00	2.00	2.00		
Total Yield (Kg)	5,250	5250	12,000		10,000	7,000	16,000		
Revenue from Agriculture	52,500	52,500	72,000	177,000	120,000	70,000	96,000		286,000
Revenue from Water Selling	6500		5000	11500	13000	1500	10000		24500
Total Revenue	59,000	52,500	77,000	188,500	133,000	71,500	106,000		310,500
% Revenue Growth					125.42%	36.19%	37.66%		64.72%
Operating Cost									
Non-Irrigation Cost (Seed, Fertilizer, Pesticide, Labour cost included)	4500	6000	19500		28000	6000	26000		
Total Fuel Cost	18750	7500	11250		0	0	0		
Pump maintenance	1000	1000	1000						
Quarterly EMI (@ 13.5% p.a.)					8,745.93	8,745.93	8,745.93	8,745.93	
Payback Period (In years)					3				
Total Operating Costs	24250	14500	31750		36,745.93	14,745.93	34,745.93	8,745.93	
Net Cash Flow	34,750	38,000	45,250	118,000	96,254	56,754	71,254	-8,745.9 3	215,516

*Non-Irrigation Cost per acre is Rs. 3000 for Paddy, 13000 for potato and 14000 for vegetables and flowers grown in summer. It includes the cost of seed, labour, fertilizers and pesticides.

**Water Selling per acres is Rs. 6500 during summer season, Rs. 3000 during monsoon and Rs. 5000 during winter season

EXPENSES			
SWP Total Upfront Investment	236500*	Loan Amount after Subsidy	85140
EMI	8745	Subsidy Amount	127710
years	3	Financed by own savings (10% of the upfront cost)	23650
interest	13.50%	Financed by Bank Loans (13.5%, 5 yrs)	212850
Loan Principal and Interest due in 5 years	111377	vs Cash flows generated in years	646548

DEBT COVERAGE AND INVESTMENT RETURN			
ROI in 1 year	87.45%	Debt Service Coverage Ratio (DSCR)	6.1

*Price of Solar Water Pump has been adjusted based on latest pricing
*A subsidy of 60% has been shown to represent current scenario

