Project Design Document: Greening of rural value chains for cotton ginning and pressing unit

Project background

Vanashree Farmers Producer Company Limited is a 1400-member farmer-producer organisation (FPO) incorporated in 2015. The details of FPO are mentioned below.

Table 1 Details of FPO

Name of FPO	Vanashree Farmers Producer Company Limited
Address	A/p Shahada, Tal: Shahada, Dist: Nandurbar Maharashtra
Activity	Cotton ginning and pressing unit
Capacity of unit	1.5 TPH
Produce	Cotton
Number of operational days	200
Connected load (KW)	350

The raw material is sourced from the member and non-member farmers of FPO in the region. The value chain is as follows:

However, the processing unit faces challenges of high operation costs and a major component is electricity cost. This issue results in low profitability of the unit.

Project description

This project aims at the solarisation of unit by installing solar PV. The electricity bill of the FPO indicates a cumulative annual electricity consumption of 203041 units. The specifications of the proposed solar PV system and annual savings are as follows,

Table 2 Details of solar PV system

Solar photovoltaic panel system	203 kWp
Annual mitigation of CO2	234.19-ton CO2 per year
Average savings on annual electricity unit consumption	296440 units
Average saving on annual electricity bill	INR 37,00,000

*Assumption:

1. Saving per unit electricity consumption INR 10 per KWh
2. Average power generation per KWp= 4 kWh/KWp/day

Summary of investments

Total project cost is expected to be close to INR 111.68 lakhs that includes design, engineering, procurement, and installation. Per kW cost of solar PV is considered 50,000 Rs/kW with EE measures of INR 5000 per kW is considered.

Table 3 Capital Costs for the project

S. No	Technology	Unit	Capacity	Qty (Nos.)	Cost (Rs/unit)	Value (Rs.)	Cost sharing			Sharing (%)	Relevant schemes
							FPO equity **	**Govt subsidy**	**Loan**		
1	Project Cost*										
	Solar photovoltaic panel system with battery	kW	203.041	1	1,01,52,050	1,01,52,050	20,30,410	0	81,21,640		
	Energy-efficient measures			1	10,15,205	10,15,205	2,03,041		8,12,164		
	Total				1,11,67,255	1,11,67,255	22,33,451	0	89,33,804	20::0::80	

**Project cost includes all costs (plant and machinery, solar photovoltaic panel costs, et al), excluding land cost*

***Based on discussions held on the ground and their financial conditions, equity share ranges from 5% to 30%, hence has been assumed at 20%*

Financial analysis

A simple cash-flow analysis is below, with the conservative assumption that the equipment has a lifespan of 20 years.

Project cost

The project cost of 111.68 lakh includes solar panel equipment cost and installation cost, other components of the project cost are taken as zero as the plant is already installed and operational.

Means of finance

Regarding the implementation of solar rooftop installations for industrial consumers, no subsidies are accessible for this initiative. Consequently, the funding for the project will be undertaken by the FPO. The financial arrangement for this venture entails a 20% equity investment from the FPO and the remaining 80% through a loan arrangement. Additional specifics concerning the financing breakdown can be referenced in Table 5.

Table 4 Means of Financing

Means of Finance		
Total Financing required	INR lakhs	111.68
Equity	%	20%
Grant	%	0%
Debt	%	80%

Interest Rate (Per Annum)	%	12.00%
Moratorium	Years	1
Annual Instalment	Years	5
Equity Component	INR lakhs	22.33
Grant Component	INR lakhs	0
Debt Component	INR lakhs	89.34

Source: MP Ensystems Research

The financial indicators analysed by discounting cash flow at 10% and the summary is presented in **Table 5**.

Table 5 Estimated Financial Indicators

Financial Indicators	Estimated	Requirement
Net Present Worth	164.11	Should be positive
IRR	39%	> 10%
BCR	2.8	Should be >1.0
Payback period	5.2 years	

Source: MP Ensystems Research

The bank loan with interest is repayable within 5 years with a moratorium of one year.

The following specific attributes of ESG can further be achieved through the implementation of this project:

- There are a number of environmental opportunities including mitigation of carbon emissions, reduction of resource depletion. There are direct climate benefits to the project. The installation of roof-top solar results in the mitigation of 234.19 tonnes of CO_2 emissions every year.