

Project Design Document: Greening of rural value chains for rice mill unit

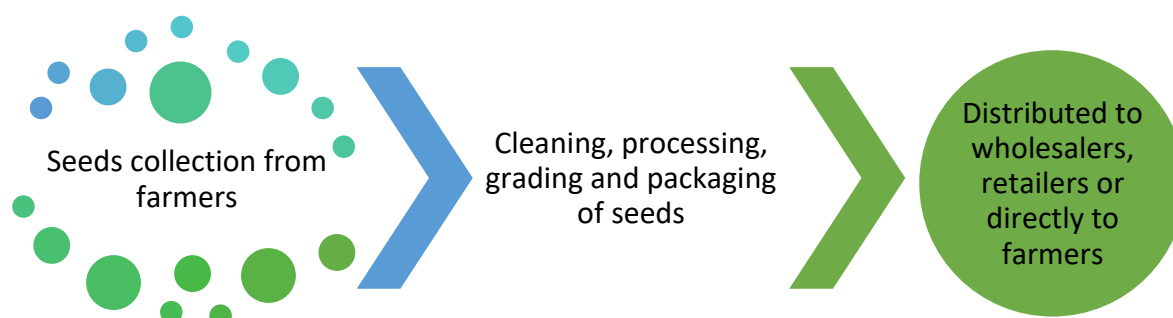
Project background

Vyahad Farmers Producer Company Limited is a 759-member farmer-producer organisation (FPO) incorporated in 2019. The details of FPO are mentioned below.

Table 1 Details of FPO

Name of FPO	Vyahad Farmers Producer Company Limited
Address	At Gondpipari District: Chandrapur, Maharashtra, India - 442702.
Activity	Trading of agricultural produce
Propose activity	Rice mill
Capacity of unit	2TPH
Produce	Rice
Number of operational days	150
Connected load (kW)	52

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 will face challenges of high operation costs, a major component of which is electricity cost. This issue will result in low profitability of the unit.

Project description

This project aims at the solarisation of unit by installing solar PV. 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	39.11 kW
Annual mitigation of CO ₂	45.11-ton CO ₂ per year
Average savings on annual electricity unit consumption	57104 units
Average saving on annual electricity bill	INR 728254

*Assumption:

1. Saving per unit electricity consumption INR 10 per KWh
2. Average power generation per KWp= 4 kWh/KWp/day
3. Average daily working of unit = 5 hours

Summary of investments

Total project cost is expected to be close to INR 21.51 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 N O	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	39.1125	1	19,55,625	19,55,625	3,91,125	0	15,64,500		
	Energy-efficient measures			1	1,95,563	1,95,563	39,113		1,56,450		
	Total				21,51,188	21,51,188	4,30,238	0	17,20,950	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 21.51 lakh includes solar panel equipment cost and installation cost, other components of project cost are taken as zero as the plant is already proposed.

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	21.51
Equity	%	20%
Grant	%	0%

Debt	%	80%
Interest Rate (Per Annum)	%	12.00%
Moratorium	Years	1
Annual Instalment	Years	5
Equity Component	INR lakhs	4.30
Grant Component	INR lakhs	0
Debt Component	INR lakhs	17.21

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	31.61	Should be positive
IRR	39%	> 10%
BCR	2.8	Should be >1.0
Payback period	5.1 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 45.11 tonnes of CO₂ emissions every year.