

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

## Project background

Chatgaon Narishakti Farmers Producer Company Limited is a 500-women member farmer-producer organisation (FPO) incorporated in 2022. The details of FPO are mentioned below.

Table 1 Details of FPO

Name of FPO	Chatgaon Narishakti Farmers Producer Company Limited
Address	Chatgaon, Dhanora, District: Gadchiroli, Maharashtra, India - 442606.
Activity	Trading of agricultural produce
Propose activity	Rice mill
Capacity of unit	1 TPH
Produce	Rice
Number of operational days	180
Connected load	30

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	23 kW
Annual mitigation of CO2	26.53-ton CO2 per year
Average savings on annual electricity unit consumption	33580 units
Average saving on annual electricity bill	INR 428000

\*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 12.65 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	Un it	Capacit y	Qty (Nos )	Cost (Rs/unit )	Value (Rs.)	Cost sharing			Sharing (%)	Relevan t scheme s
							FPO equity **	Govt subsid y	Loan		
1	Project Cost*										
	Solar photovoltaic panel system with battery	kW	23	1	11,50,000	11,50,000	2,30,000	0	9,20,000		
	Energy-efficient measures			1	1,15,000	1,15,000	23,000		92,000		
	<b>Total</b>				12,65,000	12,65,000	2,53,000	0	10,12,000	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 12.65 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		
<b>Total Financing required</b>	INR lakhs	12.65
<b>Equity</b>	%	20%
<b>Grant</b>	%	0%
<b>Debt</b>	%	80%
<b>Interest Rate (Per Annum)</b>	%	12.00%
<b>Moratorium</b>	Years	1
<b>Annual Instalment</b>	Years	5

<b>Equity Component</b>	INR lakhs	2,53,000
<b>Grant Component</b>	INR lakhs	0
<b>Debt Component</b>	INR lakhs	10,12,000

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*

<b>Financial Indicators</b>	<b>Estimated</b>	<b>Requirement</b>
<b>Net Present Worth</b>	18.59	Should be positive
<b>IRR</b>	39%	> 10%
<b>BCR</b>	2.8	Should be >1.0
<b>Payback period</b>	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 2.51 tonnes of CO<sub>2</sub> emissions every year.