Project Design Document: Greening of Rural value chains for millets

Project Background

Millets are a predominant crop grown in parts of Nandurbar district, where 45% of the population is tribal, as per the 2011 census. Millets are grown over 21,300 Ha of land (10%) in the entire district of Nandurbar. The hilly terrain and rainfed agriculture have made millet farming possible.

Figure 1. Satpuda millet processing plant, Molgi, Nandurbar

Mahila Arthik Vikas Mahamandal (MAVIM) is working as a nodal agency for the Government of Maharashtra to implement various women empowerment programs through Self Help Groups (SHGs). They help tribal women create mahila bachat gats (women's saving groups) and boost their livelihood by providing support to establish millet processing units.

With support from MAVIM, Pragati Mahila Bachat Gat has formed 10 producer groups (farmer women groups) with 30 women in each group. For processing of millets, Satpuda Naisargik Bhagar Prakriya Udyog was established and run by the bachat gat.

Project Description

This project aims at increasing the scale of operations of the processing unit, diversification of its products, decarbonisation of the energy vector and support for market linkages by enabling the branding of manufactured products. The project envisages the accomplishment of these objectives through purchasing the following equipment:

1. **10 kW solar photovoltaic panels systems and battery storage equipment** - Cumulative total savings on energy consumption amount to 13,500 units annually, assuming 6 hours of daily generation for 250 days in a year. The initial investment is compensated by savings in electricity bills for the operation of the plant at an average variable electricity cost of INR 11/kWh, while also accommodating the operation of expanded activities such as bakery, packaging and branding.
2. **Electric hauler for micro-logistical services** with a payload capacity of 500kg – cumulative total savings on using an electric vehicle as compared to diesel-powered vehicle is INR 1,13,000 annually, along with 1 tonne of CO_2 emissions mitigated.

3. **Extension of scope of operations with additional equipment** for further value addition to fetch better prices, including equipment for bakery unit, packaging unit for packaging and branding.
4. **Supporting the FPO in certification of their products** which would further improve the marketability of the product.

Summary of Investments

Total project cost is expected to be close to INR 19 lakhs that includes design, engineering, procurement, installation, first year operations and support in packaging and branding. The table below summarizes the project components and investment requirements.

Table 1: 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	Electric Hauler (Mahindra Treo Zor)	kg	500		400,000	400,000	40,000	74,000	286,000	10:18.5:71.5	FAME II
2	Project Cost*				2,900,000	2,900,000	2,90,000	1,015,000	1,595,000	10:35:55	PMFME, point iii and iv
	Solar photovoltaic panel system with battery	kW	10	1	6,00,000						
	Oven - Gas fired (36 tray) (SS body)										

	Dow mixture (3 phase)										
	Cream mixer										
	Cutter with mould										
	Trey and moulds (small & medium)										
	SS Working Table (4x10 ft)										
	Packaging machine										
	Weighing machine										
	Tools and rollers										
	Utensils										
	Branding and Packaging				1,50,000	1,50,000					

4	Land cost				125,000	125,000	0	0	125,000		
	Total					**3,425,000**	**330,000**	**1,089,000**	**2,006,000**	**10:32:59**	

Source: MP Ensystems Research

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

**Based on discussions held on ground and their financial conditions, equity share ranges from 5% to 15%, hence has been assumed at 10%

Barriers addressed in the project implementation:

The FPO has been aspiring to work to improve the income levels of farmers in the region through procurement of their produce locally at remunerative prices and distribution of the profits as dividend at a later stage. It aims to achieve these targets through a low carbon pathway, which would further improve its sustainability in the long run. The key barriers addressed through the proposed project implementation are listed below.

Table 2: Barriers addressed through the project

Barriers	**How the proposed project will address barriers through net-zero carbon solutions**
Frequent power outages, reliance on diesel generator sets as backup, high operation expenses	Installation of a rooftop solar panels which eliminates carbon emissions while ensuring continued power availability at minimal costs
High cost of fuel for transport and logistics	Use of electric hauler for local transportation to bring-in produce from the individual farms to the central processing facility
Limited scope of operations	Addition of bakery unit and further processing to produce more value-added products, which have greater visibility and fetch better prices
Market Access	The packaging machine helps shape the brand identity of the products which improves market access.

Source: MP Ensystems Research

Financial Analysis

A simple cash-flow analysis is below, with the conservative assumption that the equipment has a lifespan of 10 years.

Project Cost

The major component of a small-scale millet processing unit is land, building and civil works. A project cost of **INR 34.25 Lakhs** has been estimated. The details of project cost are given in **Table 3.**

Table 3: Total Project Cost

Project Cost					
S. No.	**Particulars**	**Unit**	**Qty.**	**Rate (Rs.)**	**Amount (Rs. Lakh)**
1	Land	acre	0.25	500000	1.25
2	Land Development				5
3	Civil Work				5
4	Plant and Machinery				19
5	Miscellaneous fixed assets				2
6	Preliminary and Preoperative expenses				2
	Total				34.25

Source: MP Ensystems Research

Operational Expenses

The operational expenditure incurred under different heads is as specified in Table 4. The operational expenditure is expected to grow at an annual rate of 5%.

Table 4: Operational expenditure

Manpower Requirement				
S. no.	**Personnel**	**Number**	**Salary (Per Month)**	**Total (Rs. Lakh/year)**
1	Plant manager	1	15000	1.8
2	Manager – Technical	1	15000	1.8
3	Supervisors	2	13000	3.12
4	Accountant	1	10000	1.2
	Total			7.92
Other Costs				
S. No.	**Cost Head**	**Annual Cost (INR)**		
1	Administrative Costs	50000		
2	Utility Costs	50000		
3	Marketing and advertising	50000		
	Annual Increase in wages, administrative and utility costs	5%	(Assumed)	

Source: MP Ensystems Research

Means of Finance

Financing to food processing falls under priority sector lending. The loans to units meeting the criteria of MSME are classified under MSME sector. Such units can be financed by any Scheduled Commercial Banks, Regional Rural Banks and Cooperative Banks. Important terms and conditions of financing such units are discussed in this section.

Table 5: Means of Financing

Means of Finance		
Total Financing required	INR lakhs	34.25
Equity	%	10%

Grant	%	32%
Debt	%	59%
Interest Rate (Per Annum)	%	12.00%
Moratorium	Years	1
Annual Installment	Years	9
Equity Component	INR lakhs	3.425
Grant Component	INR lakhs	10.96
Debt Component	INR lakhs	20.21

Source: MP Ensystems Research

Based on the assumptions on input and output parameters, an Income Expenditure statement (Cash Flow Statement) is prepared, with financial indicators analyzed in **Annexure II**.

Table: 6 Estimated Financial Indicators

Financial Indicators	**Estimated**	**Requirement**
Net Present Worth	46.63	Should be +ve
IRR	37%	> 10%
BCR	1.28	Should be >1.0
DSCR	3.5	Should be >1.5

Source: MP Ensystems Research

The repayment period has been drawn by considering net surplus available for repayment. The bank loan with interest is repayable within 9 years with a moratorium of one year. The debt service coverage ratio based on assumed techno economic parameters is found satisfactory.

The following specific attributes of Environmental Social and Governance (ESG) factors 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 11 tonnes of CO_2 emissions every year, while the usage of EVs leads to the prevention of 1 tonne of CO_2 annually.
- There is a strong integration of gender-diverse leadership as most of the members of the FPO, including decision-making positions, are women. The project will increase social opportunities and strengthen existing community relations by generating local employment and increasing income opportunities.

Annexure I: Catalogue of processed products

Types of processed Products	Proportion in sales	Selling Price (Rs/kg)	Packaging Cost (INR/kg)
Processed Bhagar	50%	60	1
Ready premix	10%	300	1
Chips	20%	150	5
Cookies/Bakery	20%	200	5
Wastage of millets during processing	%	40%	
Rate of Millets	INR/kg	34	
Weighted average cost of packing	INR/kg	2.6	

Annexure II: Calculation of financial indicators

Particulars	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**	
Capital Cost	34.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Recurring Cost	20.4	23.6	29.6	32.9	36.2	39.5	40.1	40.7	41.4	42.1	
Total Cost	54.7	23.6	29.6	32.9	36.2	39.5	40.1	40.7	41.4	42.1	381
Benefits	23.4	29.3	41.0	46.8	52.7	58.5	58.5	58.5	58.5	58.5	486
Net Benefits	-31.3	5.6	11.3	13.9	16.5	19.0	18.4	17.8	17.1	16.4	
Discounting Factor	10%										
Net Present Worth	46.63										
IRR	37%										
BCR	1.27										
DSCR	3.79										