सत्यमेव जयते

Nanaji Deshmukh Krishi Sanjeevani Prakalp (PoCRA)

Maharashtra Project on Climate Resilient Agriculture

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DETAILED PROJECT REPORT

(Template)

Soy Milk / Tofu Unit

Prepared as a part of

Memorandum of Understanding (MoU-IV)

Between

Nanaji Deshmukh Krishi Sanjeevani Prakalp (PoCRA)

And

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1 Introduction: Soybean as a commodity

Glycine max (L.) Merrill is a self-pollinated diploid annual legume. It is thought to have been domesticated for food around three thousand years ago in eastern China from its viny wild relative, Glycine soja. Most soybean seeds, unlike Glycine soja, do not have a dormancy phase following harvest, and hence rely on human agriculture. The soybean is a tall, branching plant that can grow to be more than 2 metres (6.5 feet) tall. Soybeans may be grown in a variety of soil types, but they thrive in sandy loam that is warm, productive, and well-drained. Soybean flowers are white or purple, and seeds can be yellow, green, brown, black, or bicolored, however most commercial cultivars have brown or tan seeds. Each pod contains one to four seeds.

Because of its high productivity, profitability, and critical contribution to soil fertility, soybean occupies a significant position in the world's oilseed farming situation. The crop is also the world's most important seed legume, contributing 25% of worldwide vegetable oil production, nearly two-thirds of the world's protein concentrate for cattle feeding, and is a valuable element in formulated poultry and fish diets.

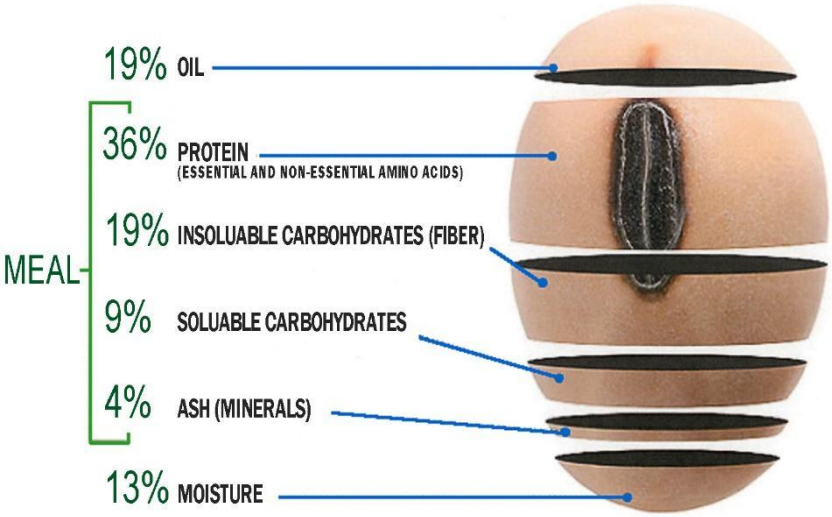

Figure 1.1 Composition of Soybean grain

(Source-https://www.nopa.org)

1.1 Composition of Soybean

Soybeans are abundant in protein and have a high nutritional value. It contains around 19% oil and 36% high-quality protein (as against 7.0 per cent in rice, 12 percent in wheat, 10 per cent in maize and 20 to 25 per cent in other pulses). Soybean protein is high in the essential amino acid lycine (5%), which is lacking in most cereals. It also has a lot of minerals, salts, and vitamins (thiamine and riboflavin), and its sprouting grains have a lot of Vitamin C. Vitamin A is present in the form of precursor carotene, which is transformed into vitamin A in the intestine.

1.2 Production of soybean in PoCRA district

Production of Soybean in India has increased at a CAGR of 9.60 per cent while a convincing growth of 43% in the annual production is observed in Maharashtra in the previous decade (43.16 lakh tonnes in 2010-11 to 62.01 lakh tonnes in 2020-21). Over the decade, an average annual production of soybean in Maharashtra has been 62.01 lakh tonnes wherein a major contribution has been from the PoCRA district (39.3 lakh tonnes). That means, around 63% of the state's soybean production has come from the PoCRA district. Figure 1.2 shows the distribution of Soybean production in the PoCRA district. The three major producing districts are Buldana, Latur and Washim.

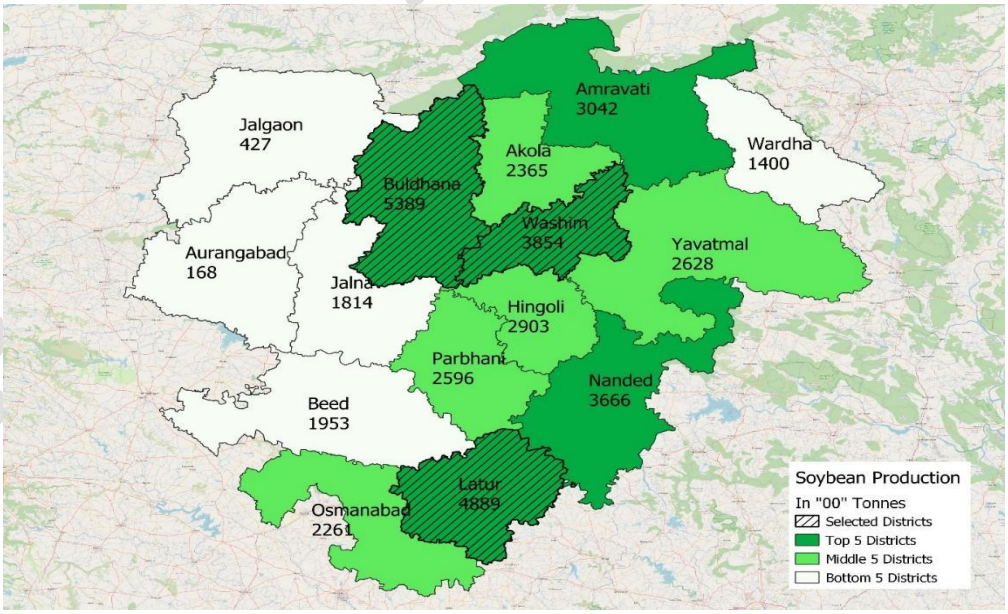

Figure 1.2 Production of Soybean in PoCRA districts

1.3 Quantum of Soybean in visited FPCs

The field work suggested that the quantum of soybean in FPCs was variable and a summary of the observed quantum is presented in Table 1-1. Four categories of quantum being <10MT/annum, 10-100MT/annum, 100-500MT/annum and >500MT/annum was made. Most of the visited FPCs dealt in >100MT/annum. The purpose of field visit as stated was to understand ground realities and current practices of FPCs. Moreover, the field work was a sample survey comprising of a small sample size, therefore generalization of quantum based on geography, capacity of FPCs etc. would be inappropriate. (Turmeric row in the below table could go in the turmeric part)

Table 1-1 Quantum of Soybean in visited FPCs

	<10 MT/annum	**10 to 100 MT/annum**	**100 to 500 MT/annum**	**> 500 MT/annum**
Soybean	7 (B-2,J-3, L-1, Y-1)	6 (B-1, H-3, J-1, Y-1)	10 (B-1, H-1, J-1, L-4, W-2, Y-1)	8 (B-1, H-2, L-3, W-2)

A- Aurangabad, B- Buldana, H- Hingoli, J- Jalna, L- Latur, Y- Yavatmal , W- Washim

The current soybean related activities in most of the FPCs comprised on cleaning, grading, packaging and trading. Based on discussions with the FPC directors, it was calculated that the soybean grain trading provided them a profit of around 2%. Certain FPCs were involved in soybean seed processing which generated an average profit of 15%. However rejection rate in seed processing was high and the rejected soybean would be sold as grain in market. Pertaining to soybean, no other processing activities were observed during field visits.

2 Proposed value added product

Given the numerous benefits of soybean consumption, it is past time to promote soybean consumption as a food component. When processed into edible forms, soybean can replace traditional diets due to its high nutritional value. In daily dietary systems, it can be used in the form of soymilk and milk products such as tofu / soy paneer.

2.1 What is Soymilk?

Soymilk is prepared by soaking and crushing soybeans in water to produce a creamy, milk-like beverage. In mainland China, soymilk has been consumed for centuries. Soymilk is an economical, lactose-free, highly digestible, and nutritious alternative to a dairy and meat-based diet, in addition to being high in protein, vitamins, and minerals. It can perform nearly all of the functions of bovine milk. It is a cholesterol-free product with a low fat content and a high concentration of polyunsaturated phospholipid fatty acids, particularly lecithin and linolenic acid. Soymilk typically has a total solids content of 7-8 percent. When 3-4 percent sugar and around 0.05 percent salt are added, it reaches a sugar, salt, and total solids level that is similar to toned (2 percent fat) cow's milk, i.e. about 12-13 percent total solids. This can be consumed as such or after sweetening and diluting, alternatively, it can be made into yogurt (curd) or tofu (paneer).

1.1.1.1 **Health benefits and comparison to dairy milk**

Table 2-1 illustrates that soymilk has a nutritional content that is nearly equal to or better than human and cow milk. Lactose intolerance affects around half of India's adult population. They get sick, bloated, have abdominal pain, and have gas after drinking milk. Lactose intolerance occurs in humans when the capacity to digest lactose, the carbohydrate component of cow/buffalo milk, is lost. The majority of people who have this problem are unable to notice signs when they consume dairy products. They simply refuse to consume milk. For children and adults who are lactose intolerant or allergic to bovine milk, soymilk is the effective alternative.

Table 2-1 Composition of Soy milk as compared to other milks

	Human	Cow	Buffalo	Soybean
Moisture	87.43	87.20	82.76	93.00
Fat	3.75	3.70	7.38	2.00
Protein	1.63	3.50	5.48	3.00
Lactose	6.98	4.90	5.48	0.00

Ash	0.21	0.70	0.78	0.20
Other carbohydrates	0.00	0.00	0.00	0.00

2.2 Market demand and Potential in PoCRA region

Currently Soy beverages have a niche market but with the increasing health consciousness among the general people, the use of Soybean is getting acceptance in the form of Soya milk, Tofu and Soya curd etc. Globally, the consumption of soy milk has increased at a rate of 20.8% from being 13.48 billion litres in 2015 to 16.29 billion litres in 2018. The global Leaders in soy milk production are as follows:

USA: DuPont, Kraft, SunOpta, Twin Oaks, Vermont Soy, White Wave, Biodyn

Europe: Unilever, TofuTown, Kalma, Assoy

Canada: Earth's Own, Yeliv

Israel: Tnuva

India: Hershey, Life Health Foods

Iran: Soya Sun

South Korea: Namyang

Latin America: Compania de Alimentos, Café Soluble, Toni S.A.

Africa: Health Life, Relish

In India, the soya milk sector is valued at Rs 50 crore. International brands like Silk and Soyfresh, as well as domestic names like Sofit (Hershey Foods) and Staeta Soy Milk, currently dominate the soy milk market (ProSoya Foods). In 2011, even Hindustan Unilever made a stir in the sector with Kissan Soya Milk. Ruchi Soya Industries, an FMCG company, also intends to re-enter the soya milk market with a changed offering and maybe a new brand. In 2008, the creator of the Nutrela brand of soya nuggets and edible oil entered the soya milk industry under the N'rich brand, but later exited. Since India is mainly a country of vegetarians, India has high potential for Soya products. Soy products are already penetrating in the Indian markets and the

soy milk and soy drinks category is forecasted to grow at a CAGR of 10.6 % between 2018 to 2023 (Fnbnews, 2019). The characteristics of soy milk being lactose free makes it a superior alternative for lactose tolerant population. Soymilk and soy products has the potential to be competitive in the functional food market which is constant growing due to the health awareness and rising incomes of the Indian populations.

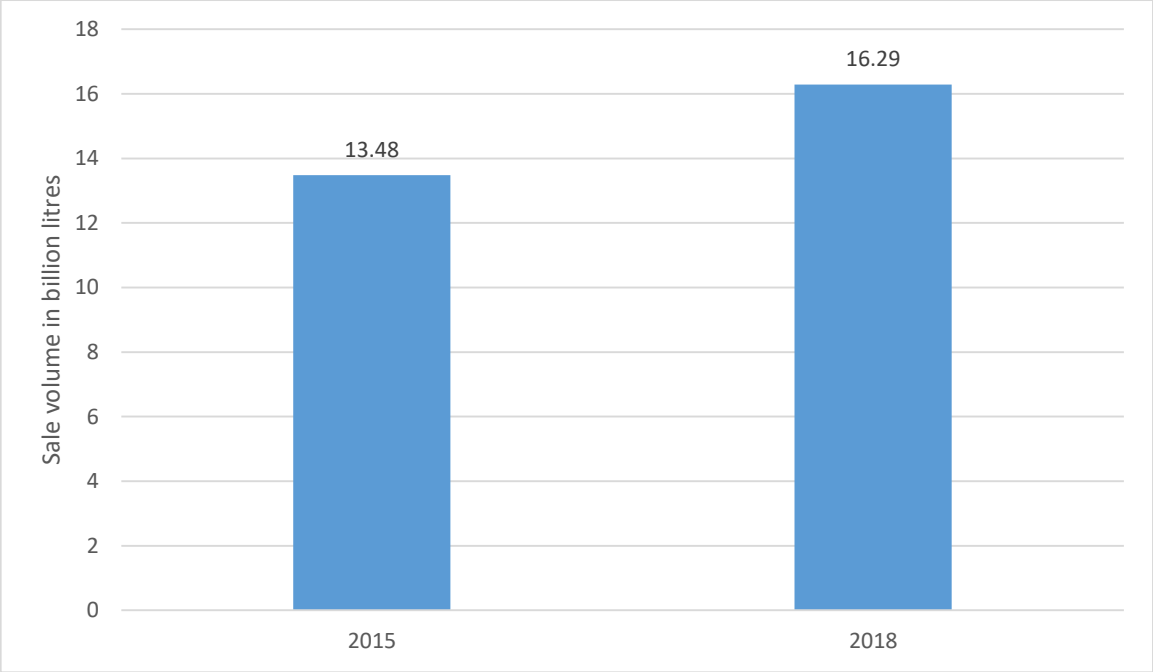

Figure 2.1Global sale of soy milk in year 2015 and 2018

Since PoCRA region has large soybean production, the availability of soybean as raw material should be convenient. Currently, the market of soy beverage is already well established in Tier-1 cities and due to the growing trend of health consciousness in Tier-2 and Tier-3 cities, the demand of soy milk and tofu is expected to rise in PoCRA region as well. The soy milk intervention could be setup even at small scale. The processing technology is simple and ready available in the Indian markets. Details of soy milk processing and economics of manufacturing is discussed in following section.

3 Techno-economic analysis

The following section describes the process and financial analysis of soy milk and tofu manufacturing plant.

3.1 Process flow diagram

The soymilk is produced in the processor by cold grinding of properly soaked soybeans in water without air, pressure cooking the resulting slurry with culinary steam and separating the soymilk from the undissolved solids (okara) in a filter press (Figure 3.1). The basic soymilk thus obtained is absolutely free from any chemical impurity and can be easily formulated into tasty cold or hot drinks, or further processed to produce tofu, yogurt, frozen desserts and a variety of other products. The list of equipment required are Grinder, Cooker; Steam generator (Boiler); and Tofu press. The production of tofu consists of two main steps: 1.The preparation of soy milk. 2. The coagulation of this soymilk to form curds which are then pressed to form tofu cakes. In general, 1 kg of soybean produced around 7.5 litre of soy milk while 1 litre of soy milk produced around 0.2 kg of Tofu after processing soy milk with coagulant.

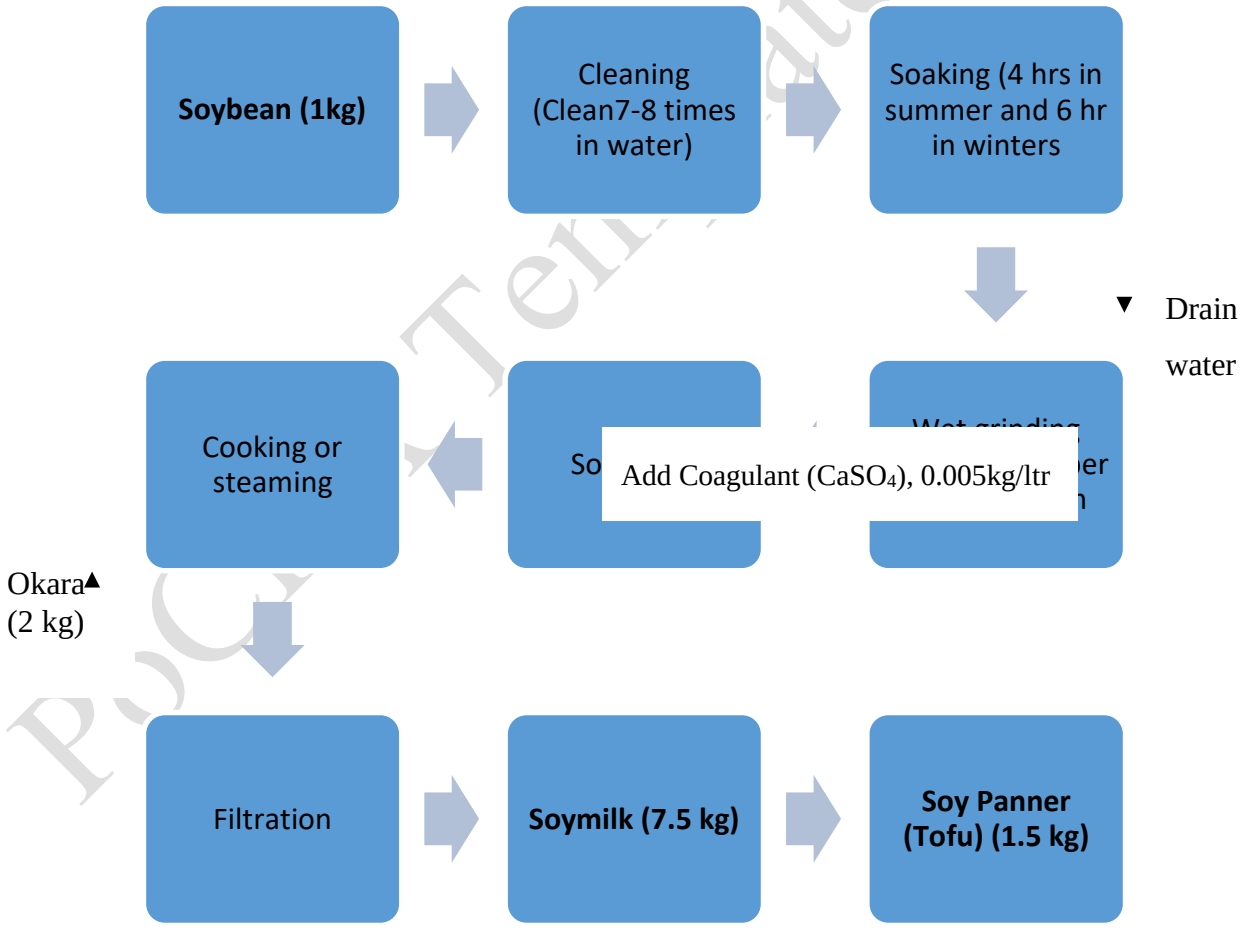

Figure 3.1 Process flow diagram of Soy milk and Tofu processing

3.2 Plant layout

The plant layout for soy milk and tofu processing plant is presented in Figure 20.5.

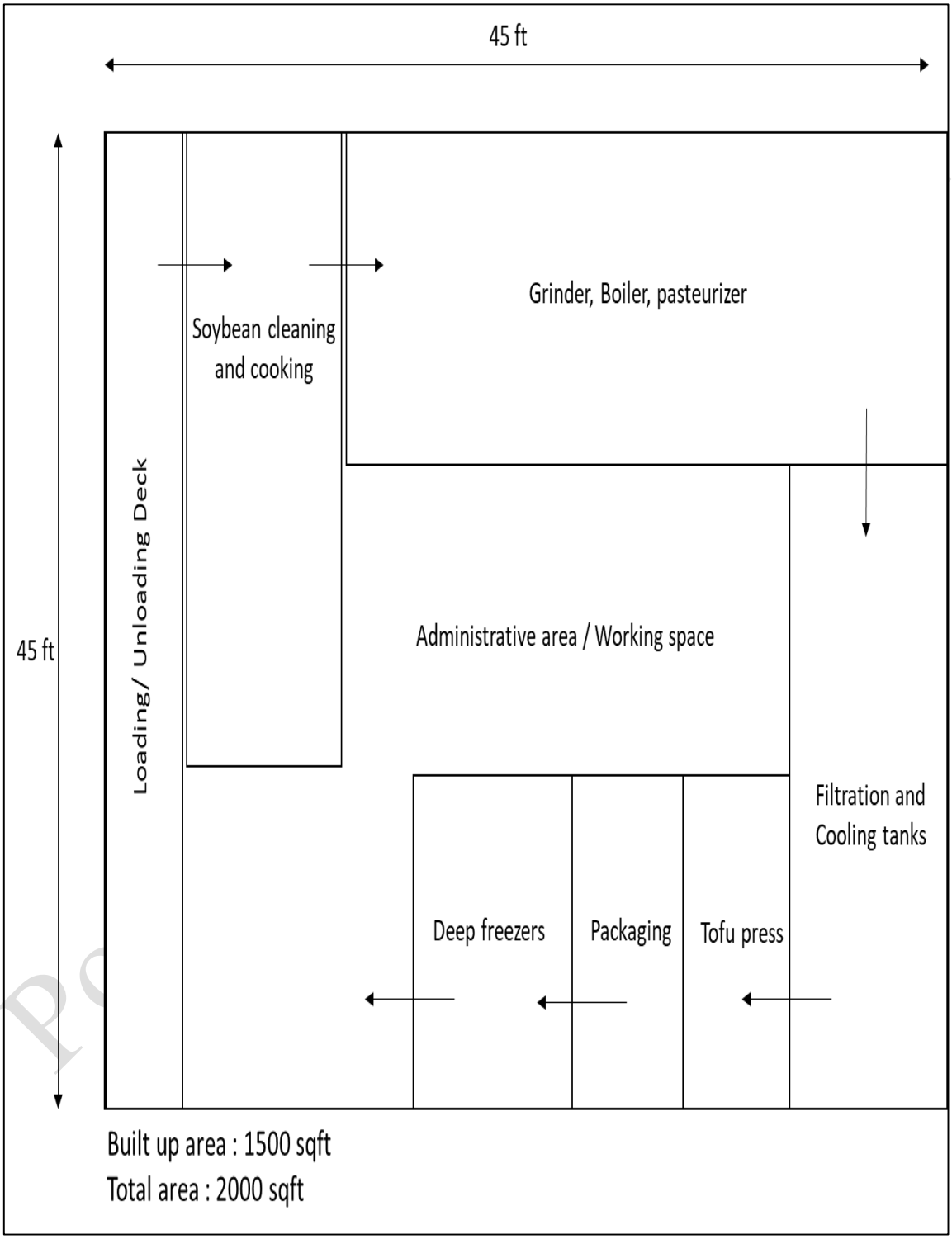

Figure 3.2 Plant layout for Soy milk and tofu processing plant

3.3 Financial analysis

Table 3-1 presents the financial analysis for a soy milk and tofu processing unit of 350 ltr/hr capacity. The assumptions and costs are considered after through study of literature and contact with manufacturers/vendors. The analysis has been done considering the 200 days of operations. A work shift of 8 hours is used for the analysis and based of these considerations, the annual raw material requirement (raw soybean) is estimated to be around 75 tonnes. The fixed cost (capital investment) include the cost of machinery, land, civil construction, taxes and pre-operative expenses. The operating or variable cost include the salaries of staff, cost of raw material, power/electricity, fuel, maintenance and contingency. The costs of individual items is mentioned in Table 3-1.

It is considered that of the total production, soy milk is 60% while Tofu is 40%. That means, that the 40% milk is converted into tofu. As mentioned in the process flow diagram (Figure 20.4), 1 litre of milk produces 0.2 kg of tofu. Therefore the annual production of the plant at full capacity and 60-40% distribution of milk and tofu is 336000 litres and 44800 kg respectively. Assuming a wholesale selling price of soy milk and tofu as Rs. 30 litre and Rs. 120/kg, the annual income of the plant is estimated as Rs. 1,54,56,000. Considering the life of plant as 10 years, the Net Present Value (NPV) is calculated to be Rs 1,25,26,666 at a discount rate of 10%. The calculation indicate an internal rate of return (IRR), benefit to cost ratio (BCR) and discounted payback period (DPBP) as 36%, 1.67 and 3.13 years respectively. Since, the value of IRR is in the acceptable range while BCR is more than one, it could be inferred that the soy milk and tofu processing unit of the proposed capacity is convincingly profitable.

Table 3-1Financial summary of Soy milk and Tofu processing unit

Value addition intervention – Soy milk/Tofu processing unit		**Remarks/Details**	**Values**
A. Machine Capacity		In litre/hour	350
A.1	*Number of operating days*		200
A.2	*Raw material requirement per annum (at full capacity)*	In kg	74667

B. Capital Investment				
B. l	*Cost of Machine excluding taxes & duties (Grinder, Cooker, Manual Boiler, Tofu box, Tofu Press)*			385467
B.2	*Accessories*			
	B.2.1	Containers and Utensils		100000
	B.2.2	Vacuum packing machine	70000/unit x 2	140000
	B.2.3	Pouch sealing machine	12000/unit x 2	24000
	B.2.4	Tofu slice/cutting machine (Cap-100 kg/hr)	15000/unit x 2	30000
	B.2.5	Deep freezer cost (500kg/hr)	Seven days storage post Tofu production	169641
B.3	*Land (plant area)*		In sqft (square feet)	2000
	B.3.1	Land cost (ownership/leased)	1500/- sqft including taxes	3000000
	B.3.2	Civil Work including water tank and electrical work	Construction cost 1200/sqft + utility cost 300/sqft (Electrical)	3000000
B.4	*Pre-Operational Expenses*			
	B.4.1	GST on machines	18%	152839
	B.4.2	Licencing and registration fees		300000

	B.4.3	Training, Installation and delivery charges	10% of equipment cost	70911
	B.4.4	Office Furniture & Equipment		50000
	B.4.5	Miscellaneous		50000
B.5	*Total Capital Investment (B.l+B.2+B.3+B.4)*			7472858
C. Annual Expenses				
C.1	*Interest on Loan@ 10%pa*		Considering 40% of capital cost is loaned by FPC	298914
C.2	*Manpower Cost 3 Workers @ 10000/- per month*		400000/- marketing expenditure per annum	760000
C.3	C.3.1	Raw soybean	60 Rs/kg	4480000
	C.3.2	Coagulant ($CaSo_4$)	25 Rs/kg	70000
	C.3.3	Packaging material		
		C.3.3.1 Milk packing material	Tetra pack (200 ml) - 5 Rs/unit	1678320
		C.3.3.2 Tofu packing material	250 gram pieces - 2.5 Rs/unit	111888
C.4	*Power Consumption*			
	C.4.1	Unit consumed per annum		107461
	C.4.2	Cost of Electricity @ Rs. 10/kWh	Industrial power supply- 10Rs/kWhr	1074610
C.5	*Cost of Water*		RO water - 0.4 /litre	2240000

C.6	*Maintenance*			20000
C.7	*Fuel-LPG*		900 Rs/cylinder	44053
C.8	*Contingency*		5% of total fixed cost	373643
C.9	*Depreciation*			
	C.9.1	Depreciation on Furniture	at 10%	5000
	C.9.2	Depreciation on Machines	at 10%	74911
	C.9.3	Depreciation on Civil work	at 10%	300000
C.10	Total Annual Expenses (C1:C9)			11531340
D. Total production per annum			**Distribution of production**	
D.1	*Soy milk (Plain)*		60% of total production	336000
D.2	*Soy Tofu*		40% of total production	44800
E. Cost of production				
E.1	*Soy milk (Plain)*			20.59
E.2	*Soy Tofu*			102.96
F. Annual Income (Full capacity)				
F.1	*Soy Milk (Plain)*		Soy milk selling price -30 Rs/ltr	10080000
F.2	*Soy Tofu*		Soy Tofu selling price -120 Rs/ltr	5376000
F.3	*Total income*			15456000
G. Economic Indices			Plant life: 10 years. Capacity Utilization :	

		Year 1- 50% , Year 2 – 65%, Year 3 – 80%, Year 4 onwards 100%	
G.1	*Net present value (NPV)*	In Rs.	12,52,6666
G.2	*Internal rate of return (IRR)*	%	35.98
G.3	*Benefit to cost ratio (BCR)*		1.676
G.4	*Discounted payback period*	In years	3.136

3.4 Sensitivity analysis

To understand the impact of fluctuation of variables on the returns, a sensitivity analysis is done. Those variables are chosen which might vary in real time situations. These variables are cost of raw soybean, cost of water, cost of packaging material, soy milk selling price, soy tofu selling price, capital investment, operating days, production distribution and plant capacity. A variation of ± 30% in the variables is considered for this analysis while its impact on the BCR is studied. The plant capacity is varied at 200 lph, 350 lph (base case) and 500 lph while scenarios for production distribution are 80-20, 60-40 and 40-60 (Soy milk- Tofu). The analysis is done by changing one variable at a time while keeping others constant.

Figure 3.3 shows the results of the sensitivity analysis. The base case-350lph is taken as benchmark to understand the variation due to each variable. As seen in Figure 3.3, soy milk selling price is the most sensitive variable as it causes the highest variation. Similarly, in the order of sensitivity, operating days, tofu selling price and cost of raw soybean are the next three sensitive variables. Production distribution turns out to be the least sensitive, meaning that by changing the production distribution pattern from 60-40 to 80-20 doesn't affect the BCR significantly as compared to other variables. It could also be observed in Figure 3.3 that the BCR in certain scenarios is less than 1, suggesting that those scenarios should be avoided to prevent losses.

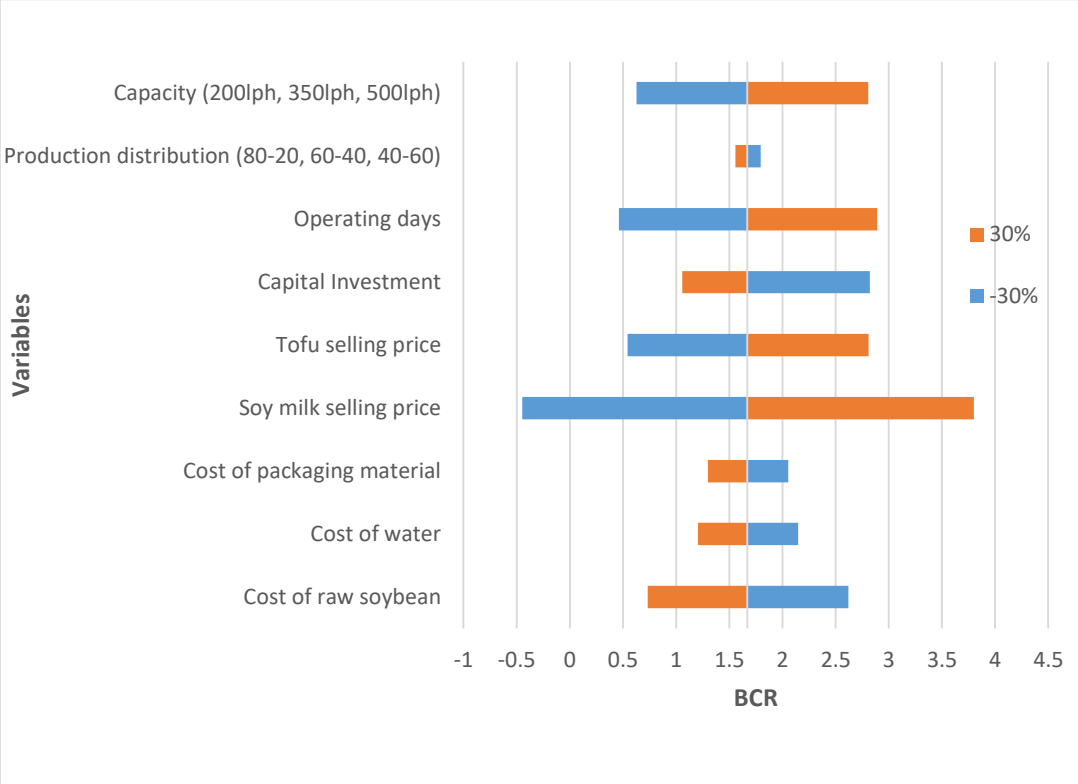

Figure 3.3 Sensitivity analysis of Soy milk and Tofu processing

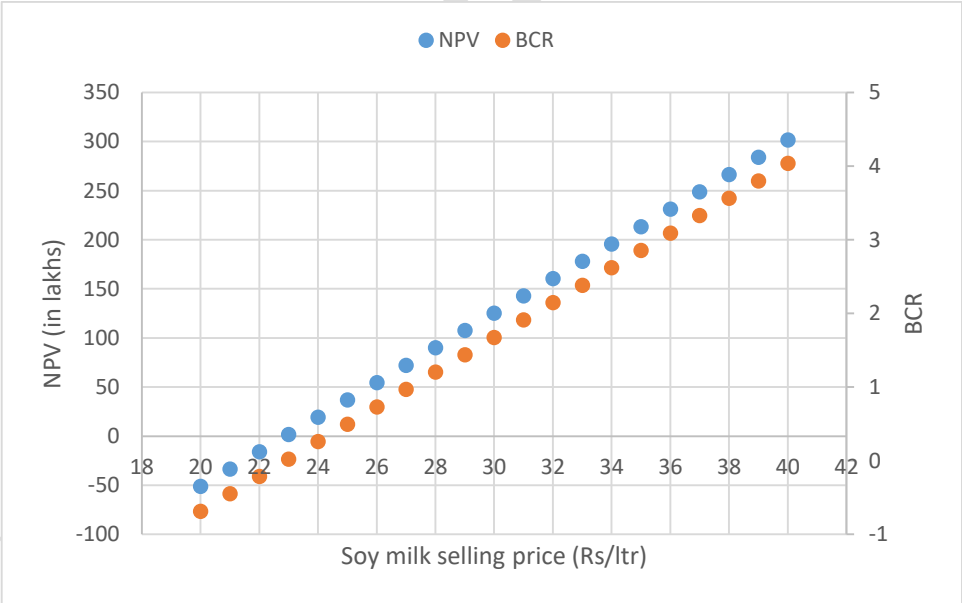

Figure 3.4 NPV and BCR vs Soy milk selling price

Since soy milk selling price is observed to be the most sensitive parameter, another study is performed to understand the variation of soy milk selling price with NPV and BCR. The purpose of this study is to identify threshold values of soy milk selling price, below which the

soy milk should not be sold to avoid losses. The cost of production of soy milk is estimated as Rs. 20.59/ltr which means selling soy milk higher than Rs. 20.59/ltr would be profitable. However, as suggested in Figure 3.4, for positive NPV, the milk selling price should be above Rs. 23. Also, considering a BCR more than 1, the minimum value for selling milk should be more than Rs. 27.15. For better scenarios such as a selling price of Rs. 40, the BCR could be as high as 4.03. It could be inferred that an appropriate price for selling the soy milk should be above Rs. 27.15/kg while to achieve a BCR of 2 and 3, the prices should be Rs. 31.4/kg and Rs. 35.6/kg.

3.5 Conjoint analysis

Three cases of raw material prices (raw soybean) are developed for conjoint analysis.

Low – Rs. 48/kg

Baseline – Rs. 60/kg

High - Rs. 72/kg

The effect on NPV of variation in raw material price and milk selling price is shown in Figure 3.5. Similarly, the effect of variation in raw material price and operating days in shown in Figure 3.6. The project viability is negative (NPV<0) in high case with low milk selling price and less operating days. Therefore these scenarios should be avoided for profit viability.

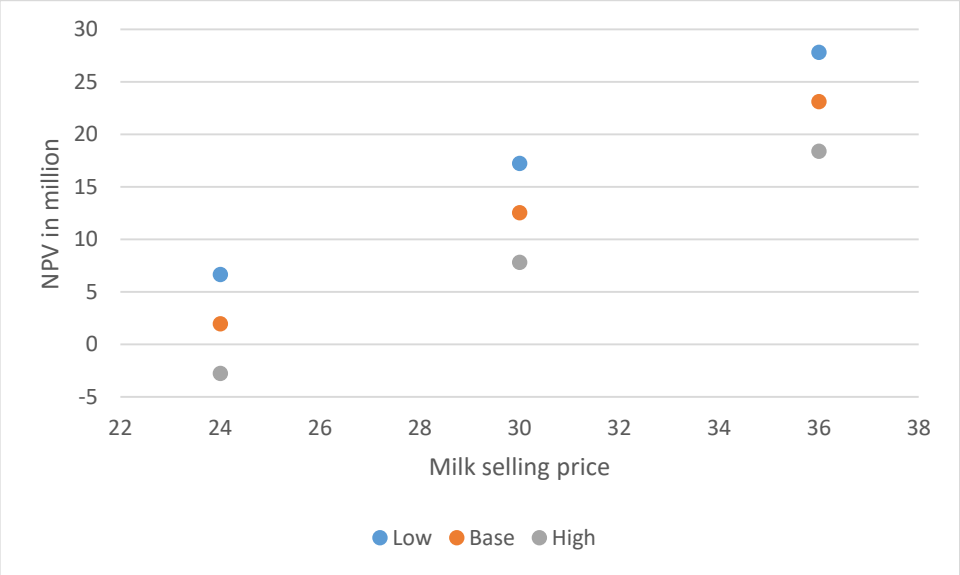

Figure 3.5 Effect of soy milk selling price and raw material price on NPV

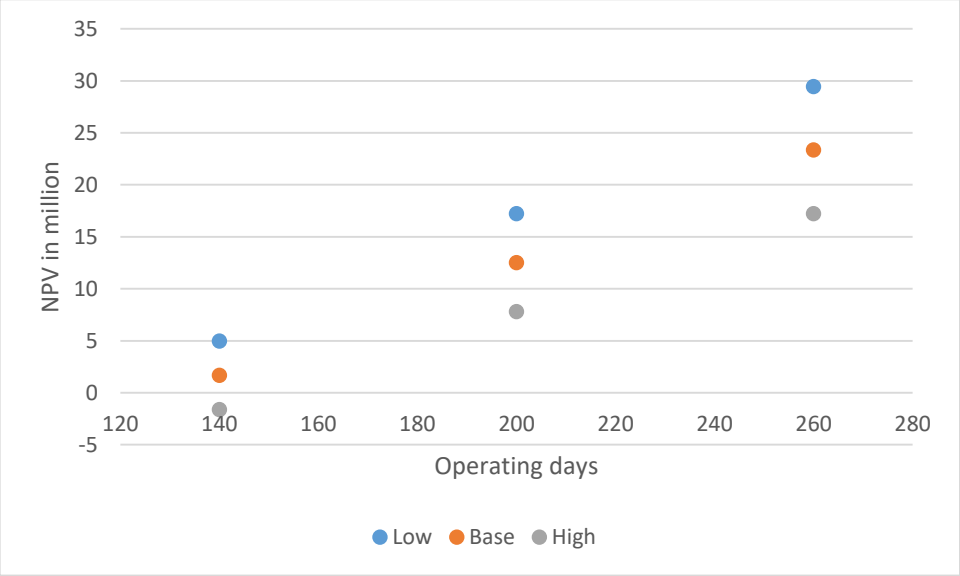

Figure 3.6 Effect of operating days and raw material price on NPV in soymilk processing

3.6 Breakeven points

The project is profitable only when the selling price of soy milk is above ₹ 27.15/lit. The project is profitable when operated at least for 140 days in case of low case and base case scenario as mentioned above and in case of high case scenario it is profitable when operated at least for 160 days.

3.7 Monte-Carlo simulations (Uncertainty analysis)

As discussed in section 13.3.5, a monte-carlo simulation has advantages over sensitivity analysis to estimate the uncertainty in a project. The parameters that may vary in soymilk processing plant simultaneously are as mentioned in Table 3-2.

Table 3-2 Range of uncertain parameters considered for monte-carlo simulation of soy milk/tofu processing unit

Parameter	Min	Max
Soybean cost (Raw material)	50	70
Soymilk selling price	25	35
Soy tofu selling price	100	140

The simulation results in terms of NPV and BCR are shown in Figure 3.7 and Figure 3.8 respectively. Ten thousand scenarios are generated using the range of uncertain parameter to capture every possible real life scenario. The blue bars indicate a favourable scenario while a red bar is an unfavourable scenario. A probability that among all the scenarios, the plant would have a positive NPV is 99.7% while that the plant will have a BCR greater than one is 78.8%.

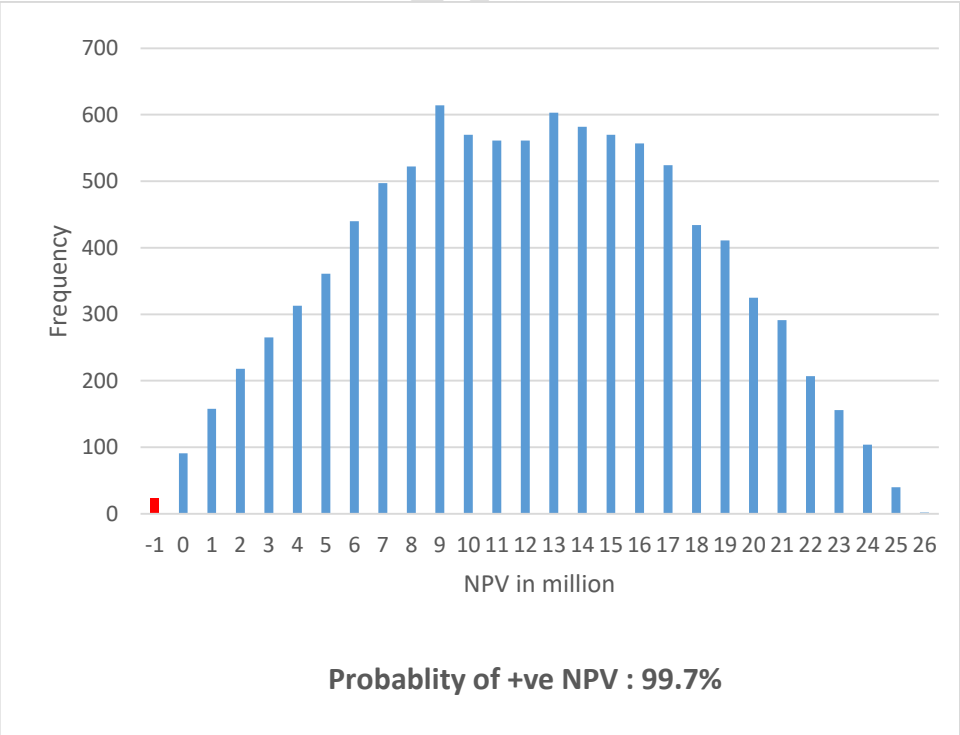

Figure 3.7 Histogram showing Monte Carlo simulation w.r.t to NPV for soymilk plant

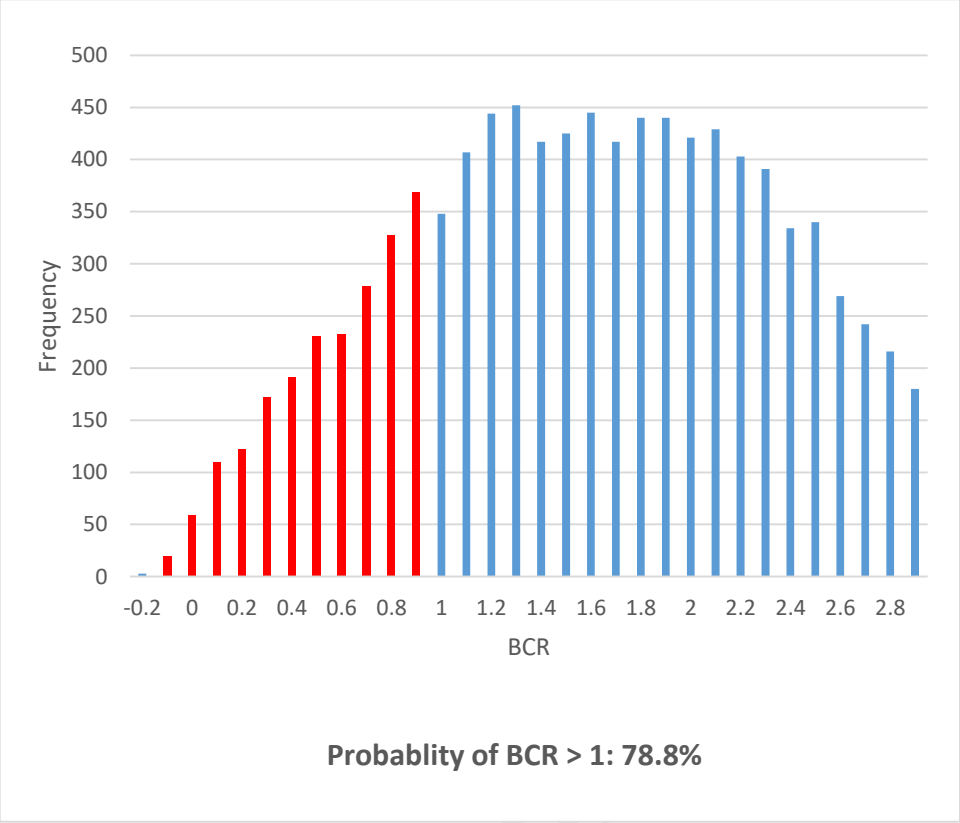

Figure 3.8Histogram showing Monte Carlo simulation w.r.t to BCR for soymilk plant

4 SWOT analysis

Strength	Weakness
• Soy milk captures the nutritional qualities of soybean and is an impressive alternative to dairy milk. • Soymilk base lends itself to making several value added products like tofu, yogurt, soy-cream, soy ice-cream and soymilk base chocolates, energy bars and sweets. • Efficient and cost-effective technologies are now available for soymilk processing.	• Lack of awareness among the general public belonging to all classes, ages and groups about the value and role of soybean and its products as indispensable part of daily diet, in providing vitamins, minerals and proteins, is a major challenge. • Advertising and promotional measures to increase the sales are also a weak point of the industry. • Lack of awareness regarding the latest innovations in the soymilk production

	process is another reason for low rate of adoption among entrepreneurs.
Opportunities	Threats
• Large scope of tapping the "Protein rich- lactose free-healthy" products market. • Scope for technology upgradation. • FPOs can also tap opportunity of soymilk for malnourished children programs or distribution in school programs.	• The taste of soymilk is different than dairy milk therefore competition with dairy milk is difficult • Branded products have high visibility and acceptance due to their constant high cost marketing efforts. Even on shelf, consumers often chose these brands due to familiarity with these brands. • Perishability of soy milk and allied products

5 Forward and Backward linkages

Following is the list of Soymilk Wholesaler:

- **Yash Enterprises**, B u bhandari industrial estate B/38 GAT No.15, taluka shirur, Sanaswadi, Pune-412208, Maharashtra, India, +91-8048250466
- **Heet Enterprise**, Mahadev nagar 136 nr. nivrutinath mandir bhatar, althan, Surat-395017, Gujarat, India +91-8048371514
- **Supreme Enterprises**, A-3, Brindavan Housing Society, Near B.A.R.C. Hospital,Lala Jamnads Marg, Deonar, Mumbai-400088, Maharashtra, India, +91-8046073527
- **Nisha Agencies**, 1st Floor 57/54 Kutti Thambiran Street, Muthu Hospital, Pulianthope, Chennai-600012, Tamil Nadu, India, +91-8046075599
- **Laksh Agro,** Kamlabai chawl halavpool masrani lane near gauri, Near gauri shankar mandir, Kurla, Mumbai-400070, Maharashtra, India, +91-8048781453
- **Amara Services,** C3/13, Nilgiri CHSL, Deonar Baug, Deonar, Mumbai-400088, Maharashtra, India, +91-8048372664

The entrepreneur must provide tentative supplier list and quotations with respect to his project. However, there are many machinery suppliers available within India for soymilk machineries and equipment. Following is the list of machine suppliers:

- **Pushpanjali** Agro Tech, Gaurav park 29 jagadhri road ambala cantt, Tangri Bridge, Mahesh Nagar, Ambala-133001, Haryana, India, +91-8048372771
- **KSP Equipment**, MCF 24, Gali No. 2, Bhikam Colony, Dominos Pizza, Ballabhgarh, Faridabad-121004, Haryana, India, +91-8048738957
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6 Food safety standards for soy milk/tofu processing unit

Food processing industry in India require certain licences to produce and market their consumable products. FSSAI (Food Safety and Standard Association India) lays the science based standards for food articles that regulates manufacturing, storage, distribution, sale and import of food. FSSAI is mandatory before starting any food business and is issued with a validity of one to five years. It is a 14 digit registration or licence number which is printed on food package.

The Codex Alimentarius Commission (CAC) was created in 1961/62 by Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO), to develop food standards, guidelines and related texts such as codes of practice under the Joint FAO/WHO Food Standards Programme. The FSSAI, (Ministry of Health and Family Welfare) has been designated as the nodal point for liaison with the Codex Alimentarius Commission. Codex standards are preferred for import and export of food articles.

6.1 FSSAI specification for raw material

Soybean shall be obtained from the plants of Glycine max (L.) Merr, which shall be mature, clean and dried seeds free from moulds and musty odour and shall also be free from non-edible and toxic seeds. Table 6-1 mentions the parameters and respective limits for FSSAI specification for soybean.

Table 6-1FSSAI specification for raw material (Soybean)

Parameter	Limit
Moisture (%), Maximum	12
Extraneous matter	< 1 % by weight of which not more than 0.25 % by weight shall be mineral matter and < 0.1 % by weight shall be impurities of animal origin
Organic (%), Maximum	
Inorganic (%), Maximum	
Immature, Shrivelled and green seeds (per cent. by mass), Maximum	6
Weevilled Seeds by count (no. of grains/100g) (%), Maximum	2
Damaged or split or cracked seed (% by mass), Maximum	4
Oil content (% on dry basis), (%), Minimum	13
Acid Value of extracted oil (Maximum)	2.5
Uric acid (mg per kg), Maximum	100

6.2 FSSAI specifications for soybean based beverages

Table 6-2 presents the FSSAI specifications for Soybean based beverages.

Table 6-2 FSSAI specification for soybean based beverages

Food Category system	Food Category	Food Additive	INS No.	Recommended maximum level
6.8.1	Soybean based beverages	Caramel III - ammonia caramel	150 c	1500 mg/ kg
		Phospahates		1300 mg/ kg
		Riboflavins		50 mg/kg
		Steviol glycosides	960	200 mg/kg
		Sucralose (Trichlorogalactosucrose)	955	400 mg/kg

6.3 Codex standards for soy milk

The term 'soybean milk' is also inconsistent with the use of terminology in the Codex General Standard for Food Additives, CODEX STAN 192, (GSFA), section 06.8.1 which uses the term 'Soybean-based beverages' and does not use the term 'Soybean milk'. Furthermore, the GSFA 06.8.1 acknowledges that in a number of countries the category 'Soybean-based beverage' includes products referred to as 'soybean milk' but does not use this terminology in the Codex standard. This approach is consistent with the spirit of the GSUDT (General Standards for the Use of Dairy Term) and is prudent.

7 List of Statutory Clearances Required

The following table mentions the list of statutory clearances required to set up the processing unit of soy milk/tofu.

S.NO.	Approval and Clearances required	Departments/Offices to be consented
1	State Investment Promotion Board, Stage – I clearance	Department of Industries
2	Environmental clearance	Maharashtra State Pollution Control Board
3	GST registration	Commercial Taxes
4	Change in land use	Land revenue department
5	Sanction and supply of power	DISCOM
6	Sanction and supply of water	

8 Conclusion

In this section, soy milk and tofu processing unit is introduced and its market potential is discussed. Based on the techno-economic analysis, it is understood that the soy milk and tofu plant of the proposed capacity is profitable with a quantum requirement of around 75 MT/annum. Based on the field visit experience, majority of the FPCs have sufficient quantum to venture into the soy milk business. Additionally, it is observed in the analysis that as the capacity of the unit is increased, the profitability increases therefore FPCs with large quantum could plan higher capacity processing plants.

The plant economics is highly dependent on the selling price of the soy milk and tofu as observed in the sensitivity analysis. A detailed uncertainty analysis using Monte Carlo method clearly shows that probability of achieving positive NPV and BCR greater than one is high.

As compared to the current activities of FPCs, soy milk processing plant could provide a profit of around 135% while trading and seed processing could generate merely 2% and 15% respectively. Therefore soy milk and tofu processing unit could be seen as highly profitable value addition intervention for the PoCRA region.