



Economic Feasibility Analysis of Processing of Sesame (Edible Oil) in Northern Telangana Zone

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Sesame is an ancient crop and is often called as Queen of seeds. Sesame oil is consumed from ancient times for its extensive health benefits. The study was aimed to analyze financial feasibility of processing of sesame to sesame edible oil in Northern Telangana Zone of Telangana state where sesame is produced extensively. The data was collected from three districts from NTZ where sesame is grown extensively. Random sampling method is used to select the sesame processors in the study area. The data has been collected from 30 sesame processors from three districts through pre schedules. The data was analysed by using discounted cash flow techniques involving Internal Rate of Return (IRR), Net Present Worth (NPW), Benefit cost Ratio (BCR) were employed.

Result: The Net Present Worth of the processing units in the study area was positive and the results revealed that the sesame processing units higher IRR (30.33) and BCR (1.60) greater than one. The study showed that sesame processing units in the study area are financially feasible and profitable. The study suggests to increase awareness about the consumption and health benefits of using sesame oil in the study area.

Keywords: *Sesame processors; financial feasibility; discounted cash flow technique.*

1. INTRODUCTION

Sesame is an ancient crop originated from Africa and Turkey. Among the oil seed crops, sesame enjoys a special status and is often called as the "Queen of seeds" [1]. Sesame is one of the most commonly eaten foods either in fresh or processed. Sesame is also an important component of many processed food products due to its excellent flavor, and high levels of many macro- and micro-nutrients. Sesame seeds contain 50-60% oil [2]. Myanmar, India and China are the three major sesame producing countries in the world. India is the second largest producer of sesame crop. In India the area cultivated under sesame is 1.6 million hectares, production is 0.65MT and productivity is 405 kg/ha in the year 2019-20. According to the 4th advanced estimates sesame production will be 0.81 MT in the year 2020-21 (Source: indiastat.com)

Sesame seed oil is an edible vegetable oil derived from sesame seeds through different processes namely hot pressed oils (Refined oils) and cold pressed oils. Refined oils are extracted using high heat. Refined oils are made by grinding them at high speed which can generate heat upto 200C and using chemicals which finally gives the oil. Cold pressing is a mechanical process in which the oil is extracted from the seeds without addition of chemicals or any other substances at a temperature that does not exceeding 35C. Pressing is the process of applying pressure to squeeze the seeds. This method allows the nutrients and vitamins being retained in the oil without being extracted since there is no application of external heat. It is the healthiest way of making oils which contains adequate amounts of nutrients. Sesame oil is a polyunsaturated semi drying oil. Sesame seed oil can be produced from black hulled and white hulled sesame seeds [3-10].

Sesame oil is composed of fatty acids such as linoleic acid (41% of the total), oleic acid (39%) , palmitic acid (8%), stearic acid (5%). The essential nutrient present in significant content is vitamin K. It consists of relatively high percentage of unsaponifiable matter (1.5 to 2.3%). In India and some other European countries Sesame oil (5 to 10%) is added to margarine and hydrogenated veget The market for sesame oil at global level experienced 5.2% value growth. Sales of sesame oil were high in the food processing industry, accounting for around 30% market share from 2016-2020. The

Sesame oil industry in India is expected to grow at a CAGR of 5% during the forecasted period of 2017-2022. The country is facing a paradigm shift in the consumption of sesame oil because of its increasing use in different cuisines, ayurveda, various massage oils, etc. The sesame oil is very popular amongst the Southern regions in India, along with countries in Asia, USA, etc.

Now a day's cold pressed oils have been preferred to refined oils due to their natural characteristic flavour and their minor bioactive components including natural antioxidants. The minor bioactive lipids present in the cold pressed oils are phytosterols, phospholipids, tocopherols, phenolic compounds, hydrocarbons, flavour and aroma compounds. The minor bioactive lipids in cold pressed oils have beneficial effect on human health such as antiinflammatory, antimicrobial, anticancer, antihypertension and lowering of low density lipoprotein. Further these bioactive compounds play an important role in prolonging the shelf life of the oil by increasing oxidative stability [11-15].

2. MATERIALS AND METHODS

2.1 Study Region

The study was conducted in Northern Telangana Zone of Telangana state where the Sesame is produced extensively. The cultivated area under sesame in Telangana state was 20,264 hectares, production was 14000 tonnes and productivity was 583.33kg/ha in the year 2019-20. Northern Telangana Zone includes Adilabad, Komaram Bheem, Asifabad, Nirmal, Mancherial, Nizamabad, Jagityal, Kamareddy, Rajanna sircilla and Karimnagar districts. Three major districts Jagityal, Nirmal, Nizamabad were selected to extensively cover the Sesame processing areas of Northern Telangana Zone of the state.

2.1.1 Location

Telangana is situated in southern peninsula of India. It is the eleventh largest state with geographical area of 1.12 lakh square kilometres. It is the twelfth largest state in terms of population with 350.04 lakh as per 2011 census. The area was separated from the north western part of Andhra Pradesh as the newly formed state on 2nd june 2014 with Hyderabad as its capital.

Chart 1. General information about the study area (2020-2021)

S. No.	Parameters	Telangana
1	Geographical area (Sq.km)	1,12,077
2	Population density (Persons per square km)	312
3	Total population (Lakhs)	350.04
	Males (Lakhs)	176.12
	Females (Lakhs)	173.92
4	Sex Ratio (Female per 100 males)	988
	Literacy rate (%)	66.54
	Administrative districts (No)	33
	Revenue divisions (No)	74
	Mandals (No)	591
	Revenue villages (No)	10,434

Chart 2. List of districts and their description

District	Parameters	Description
Jagityal	Area (Sq. Km.)	2419
	Population	985417
	Literacy rate (%)	60.26
	Annual rainfall (mm)	976.2
	Important crops	Rice, Maize, Groundnut,
	Area under sesame cultivation (acres)	Sesame, Red gram, Turmeric 28,556.08
Nizamabad	Area (Sq.km.)	4288
	Population	1571022
	Literacy rate (%)	64.25
	Annual rainfall (mm)	919.6
	Important crops	Rice, Maize, Groundnut,
	Area under sesame cultivation (acres)	Sesame, Chillies, Turmeric 23,545.52
Nirmal	Area (Sq. Km.)	3845
	Population	709418
	Literacy rate (%)	58
	Annual rainfall (mm)	767.5
	Important crops	Rice, Maize, Redgram,
	Area under sesame cultivation (acres)	Sesame, Groundnut 20,384.26

2.2 Sampling Procedure

Purposive sampling method is used to select the three districts of Northern Telangana Zone and random sampling method is used to select the oil units in each district. In each district a sample of 10 oil units are selected making a total sample of 30 oil units.

The NPV was calculated by using following formula

$$NPV = \sum Y_i (1+r)^{-i} - I$$

Where : Y_i = net cash inflow during the period, I = initial investment, r = discount rate, and i = year of life period 1, 2...n

2.3 Economic Viability of Processing Unit

a. NPV (Net Present Value): The difference between the present value of cash inflows and the present value of cash outflows. NPV is used in capital budgeting to analyze the profitability of an investment or project.

b. BCR (Benefit Cost Ratio): A ratio attempting to identify the relationship between the costs and benefits of a proposed project. Benefit cost ratios are oftenly used in corporate finance to detail the relationship between possible benefits and costs, both quantitative and qualitative undertaking of new projects or replacing old ones.

Table 1. Distribution of respondents according to socio economic characters

Socio economic characteristics	Frequency	Percentage
Gender		
Male	29	93.4
Female	1	6.6
Total	30	100
Marital status		
Married	30	100
Unmarried	0	0
Total	30	100
Educational level		
No formal education	0	0
Primary	4	13.3
Secondary	12	40
Graduation	14	46.7
Total	30	100
Sources of finance		
Private money lender	0	0
Friends and relatives	12	40
Bank	18	60
Total	30	100

Table 2. Financial feasibility of the sesame processing units

Unit	NPW	IRR	BCR
1	227776.53	31.38	0.94
2	5460482.91	58.32	1.09
3	2164405.22	13.00	1.87
4	6280472.03	11.53	1.53
5	201067.28	14.70	1.44
6	3032116.82	37.45	1.61
7	1613718.74	27.67	1.01
8	299093.06	16.06	1.15
9	3161886.70	44.67	1.81
10	2639936.77	29.88	1.51
11	1744512.27	16.35	10.21
12	383144.87	21.19	1.08
13	1907711.55	35.48	1.16
14	1708503.56	37.98	1.09
15	1604721.32	35.79	1.04
16	859504.36	28.88	1.06
17	999484.64	28.86	1.58
18	3663337.43	37.49	1.48
19	1195914.88	30.34	1.40
20	1735585.82	29.50	1.00
21	1759690.64	36.63	1.38
22	1443657.55	32.58	1.40
23	3865628.59	38.53	1.00
24	3014976.91	34.39	1.38
25	1892033.16	45.29	1.40
26	1851.97	12.01	1.52
27	2695737.75	34.99	1.36
28	733665.51	21.62	1.29
29	1730562.25	33.89	0.71
30	1676162.20	33.33	
Average	2022639.33	30.33	1.60

$BCR = \frac{\text{Present worth of gross return}}{\text{Present worth of costs}}$

c. IRR (Internal Rate of Return): The discount rate often used in capital budgeting that makes the net present value of all cash flows from a particular project equal to zero. The higher a project's internal rate of return, the more desirable it is to undertake the sesame processing unit, the project with the highest IRR would probably be considered the best and undertaken first.

$IRR = \text{Lower discount rate} + \frac{\text{Diff. between two discount rate} \times (\text{NPW at lower discount rate})}{\text{Absolute diff. between two NPW}}$

3. RESULTS AND DISCUSSION

Sesame is extensively grown and processed in Northern Telangana Zone. The data required for the study was collected from 30 sesame oil processors in Northern Telangana Zone through pre-schedules. The findings of the study are shown in the table 1 and 2. Table 1 shows the socio-economic characteristics of the sesame processors. The table 1 shows that all the respondents were married, 93.4% of the sesame processors are male, 46.7% of the processors are graduated and 60% of the processors had banks as their source of investment.

3.1 Feasibility Analysis

The NPW is used in capital budgeting and investment planning to analyze the profitability of a project. The findings of the feasibility analysis of the processing units are given in the Table 2. It shows that the NPW of the processing units is positive which indicates that the processing units are profitable in the study area. The results also showed higher IRR (30.33) and BC ratio (1.60) greater than 1 which indicates that the processing units are economically viable in the study area.

4. CONCLUSION

The feasibility analysis of the study revealed that the sesame processing units have positive NPW, higher IRR and the BCR of the units is greater than one which indicates that the processing of sesame in the study area is economically feasible and profitable. The study suggests that the processing of sesame in the study area is

profitable. The study also suggests that there is a need to increase the awareness about usage and health benefits of sesame oil in the study area.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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