Pulses and Pulses Products Cluster

MACHAVARAM-Andhra pradesh

Detailed Project Report-DPR

For

Establishment of Common Facility Centre

To Wards the Fulfillment of Requirement of Micro and Small Enterprises

Cluster Development Programme of Ministry of Micro, Small and Medium Enterprises

Submitted to: The Office of the Development Commissioner (MSME)

Ministry of Micro, Small and Medium Enterprises, Govt. of India

Nirman Bhavan, New Delhi- 110011

Prepared By: Intaglio Technical and Business Services

Supported By:

MSME-Hyderabad, Govt. of India

Dept. of Industries and Commerce, Govt. of Andhra Pradesh

Submitted By:

Sri Mahalaxmi Pulses Mills Cluster Association

Atchutapuram Road, Machavaram, Rayavaram Mandal-533261

Executive Summary

Pulses (Dal) are a wonderful gift of nature. They provide nutrition to human beings and animals. Pulse cultivation improves soil health by fixing nitrogen. Their importance as a source of protein for masses in India is well recognized and therefore, their production and availability assume special significance for the nutritional security of the people.

India, the world's biggest producer and consumer of pulses, produces 16-20 million tonne–or a quarter of global production. However, pulse production in the country is stagnating due to long standing problems. This ***disturbs nutritional balance of the population especially of poor and weaker sections*** who cannot afford expensive animal proteins.

Production of pulses has been trailing demand for 50 years, forcing Indian traders to rely on imports, which has now reached about 15% of demand. The Lack of proper Post Harvest processing facilities contributes to about 30 percent losses annually.

India has been importing pulses since the early 1980s. This was due to domestic demand for essential pulses of mass consumption were rising faster than increase in production. The imports of pulses kept on rising because country's self sufficiency level has been considerably eroded over the past two decades. ***Currently, India imports more than 15 per cent of domestic production.*** It was observed that demand and production gap per year is around five million tonnes. ***The import bill for more than four million tonne of pulses in 2014-15 was Rs 15,990 crore.***

Without government intervention and a long-term plan, prices of pulses may stay high coming years. ***In order to meet the projected demand of 32 million tonnes of pulses by 2030***, as per the Vision 2030 paper prepared by the Indian Institute of Pulses Research ***will, require a paradigm shift in research, technology generation and dissemination, popularization of improved crop management practices, commercialization, Post Harvest Processing and Storage*** along with capacity building of the stakeholders in frontier areas of research.

The lack of advanced processing and lack of waste minimization technologies adoption by the processing industries is one of the major issues in the poor performance of pulses market. Government interventions in the pre processing and post processing sector would provide adequate support in achieving sustainability of the pulses demand-Supply.

Thus it is very essential to upgrade India's post harvest processing capacity to save the wastage of pulses due to lack of processing, the CFC with advance machinery will help in minimizing the wastage of pulses during processing by up to 30%.

Pulses and Pulses Products Cluster- Machavaram, Rayavaram Mandal is promoted by Sri Mahalakshmi Pulses Mills Cluster Association is located in Rayavaram Mandal of East Godavari District. The Cluster has 119 Micro Units providing employment to about 595 people directly and about 1500 people indirectly. The estimated turnover of the cluster is Rs. 77.00 Crores for the year 2018-19. The Cluster has good availability of Raw material about 1.3 lakh tons in the cluster region and 5 lakhs tons in the district. The processing machineries are traditional mechanical machines as a result the productivity and quality of product is low.

In order to address the problems of the cluster the SPV proposes to establish the Common Facility Centre with advance machineries. The DSR has recommended the hard interventions. The State Level Steering Committee has cleared the project. The Project is accorded In-Principle Approval by MSME New Delhi in its 51st Steering Committee Meeting held at MSME New Delhi.

The estimated cost of establishment of CFC is **Rs. 1483.06 Lakhs** with GoI contribution of **Rs. 1186.44 Lakhs (80%),** Govt. of Andhra Pradesh contribution of Rs. 148.31 Lakhs (10%) and SPV contribution of Rs. 148.31 Lakhs (10%).

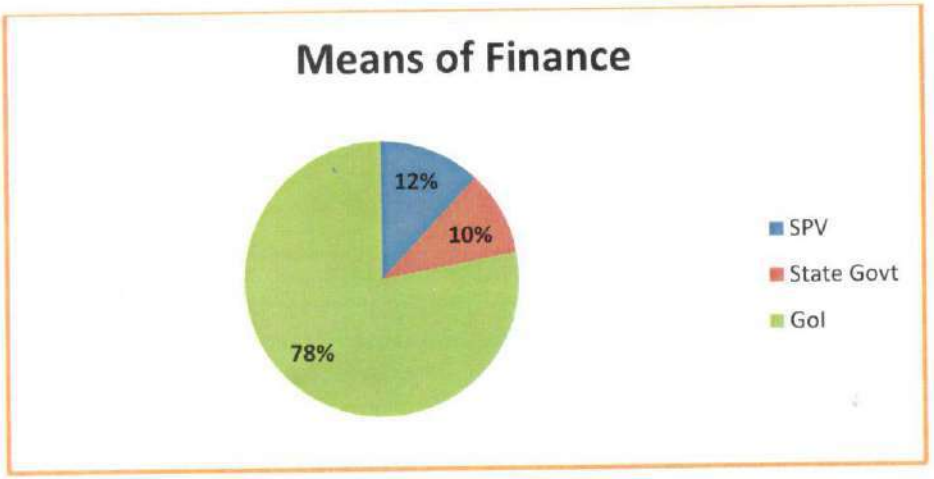
The CFC will have pre-processing and post processing machineries to improve the productivity and quality of the products along with the storage, Testing, Training and research facilities. The Project is technically feasible and financially viable project. It is a support worthy project.

1. Project Cost and Fund Utilization Pattern

Sl. No.	Particulars Of Cost	Amount in Rs. Lakhs	% of Project Cost
1	Land 1.06 acres with Building-20000sqft on lease for 15	120.00	8.09%
2	Building construction	0.00	0.00%
3	Plant And Machineries	1,244.82	83.94%
4	Misc. Fixed Assets-Furniture	20.00	1.35%
5	Pre Operative Expenditure (Advance For Power Etc)	20.00	1.35%
6	Contingencies (2% Building And 5% Machineries)	62.24	4.20%
7	Margin Value Of Working Capital	16.00	1.08%
	Total Project Cost	**1,483.06**	**100.00%**

2. Means of Finance

Sl. No.	Agency	Amount In Lakhs	% Of Project Cost
1	SPV	148.31	10.00%
2	State Government-Andhra Pradesh	148.31	10.00%
3	MSME GOI	1,186.44	80.00%
	Total	**1,483.06**	100%



1.3 Milestones Already Covered

1. SPV is formed and registered
2. Bank Account opened in the name of SPV.
3. Land Leased Registered Agreement is executed
4. DPR is prepared and validated.
5. DPR is approved by State Govt.
6. DPR is approved and Accorded In-Principle Approval by MSME New Delhi.
7. In-principle Sanction of Electrical Load is availed
8. NOC from Pollution Control Board is availed.
9. Working Capital Letter from Bank is Availed.
10. Micro Certificate from DIC is availed.
11. Commitment letter from SPV for Fund Contribution is Availed.

1.4 Summary of Financial Analysis

The project is financially viable with the following ratios

a) IRR Post Tax 26 %
b) NPV Post Tax 26%
c) Breakeven Point 35 %
d) ROCE 41%

The ratios with sensitivity of 5% reduction in revenue:

a) IRR 24 %
b) NPV 24 %
c) Breakeven Point 43 %
d) ROCE 33 %

The ratios with sensitivity of 10 % reduction in revenue:

a) IRR 22%
b) NPV 22 %
c) Breakeven Point 45 %
d) ROCE 30%

Comparison between Expected Ratios

Sl. No.	Particulars	Expected Ratios As Per MSE-CDP Guidelines	Achievable Ratios By The Project
1	Internal Rate of Return- IIR	Above 10%	26 %
2	Net Present Value- NPV	Need to be Positive	26%
3	Breakeven point	Below 60%	41%
4	Return on Capital Employed-ROCE	Above 25%	35%
The ratios achievable by the CFC project are according to MSE-CDP guidelines			

1.5 Expected Outcome of the Project

Particular	Present	After intervention
Units	119 units	150 units
Employment	Direct = 595 Indirect = 1500	New direct = 1000 New Indirect = 3000
Product Quality	The quality of product is little poor due to lack of advance processing machines and there is very little value addition taking place	Improved quality of product with product diversification and value addition
Market	Domestic and village/ local District market	Urban, National and international market
Average Turn over	Rs. 77.00 crores	Rs. 100 crores after two to three years of CFC
Capacity	12500 tons per year	20000 tons per year
Processing Losses/Wastage	30% to 35% wastage and losses taking place	The percentage of loss can be minimized to 10% by the use of advance machinery at CFC
Testing	No such facility available	Test labs for standards and certification with state of art facility of FSSAI Standards
Trade	High degree of dependence of the producer on the traders at the mandis	Direct access to profitable markets. Lowered dependence on traders
Export	Nil or very little indirect trade	Direct export likely by 5 units
Profits	Inconsistent profit margins due to price fluctuations, product quality inconsistencies and inefficiencies in production	Consistent and 20 to 25% higher profits for producers due to better quality and price and increased production efficiencies.

1.7 Implementation Schedule and Agencies

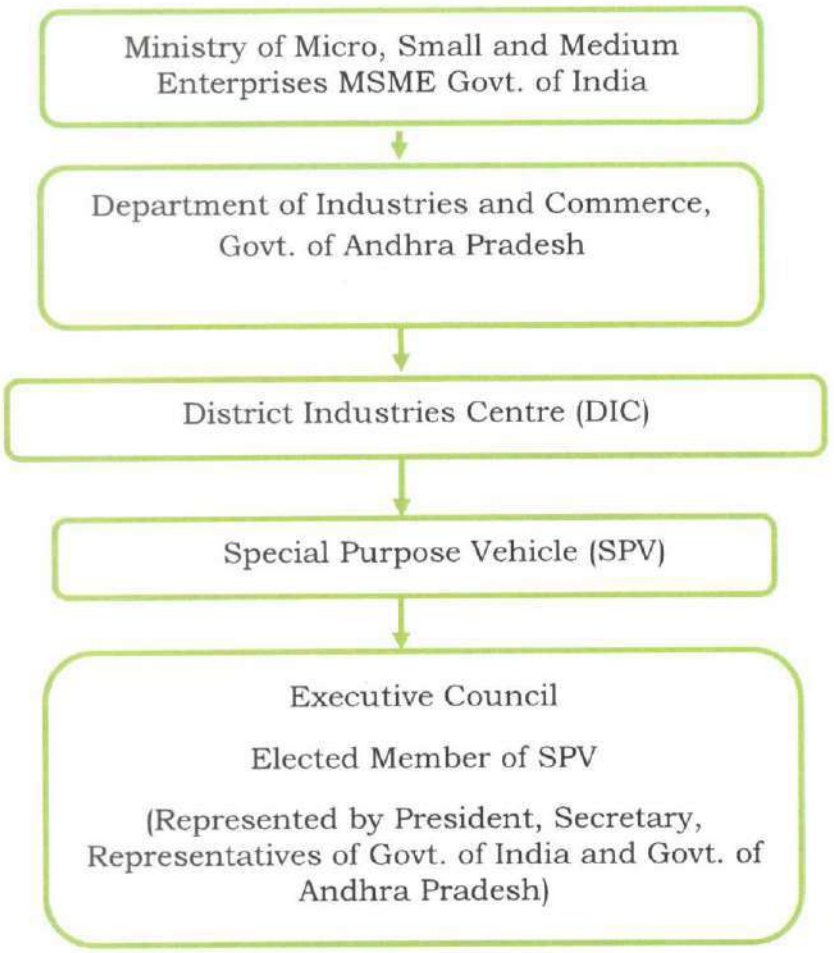
Agencies

The time required for the implementation is expected to be about 18 months. A detailed description is given at the executive summary.

In order to overcome the short comings of the cluster a Special Purpose Vehicle in the form as a society has been registered.

Monitoring Mechanism for Reporting progress will have the following:
The Govt. of India (MSME): - will be the highest authority for monitoring the progress made in the project during different stages of development.

State Government Agency: Department of Industries and Commerce, Govt. of Andhra Pradesh



Intaglio Technical and Business Services will be the PMC/Cluster Development Agency/CDE for the Implementation of the Project as a Technical Agency.

1.8 Implementation Schedule

Planning Timeline	Months																			
Tasks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Land Development and Boundary Wall																					
Electricity and Water facility Installation																					
Construction of CFC Building																					
Machinery Tendering/order																					
Arrival of Machinery																					
Erection of Machinery																					
Commissioning																					
Commercial Usage																					

The CFC will be completed within 18 months from the date of final approval order.

Table of Content

Chapter 1

Brief Overview of the Cluster

Sl. No.	Particulars	Answer
Cluster Details		
1	Name of the cluster and SPV with Address	**Pulses and Pulses Products Cluster**-Rayavaram-Andhra pradesh
2	Age of the cluster	40 years
3	Address of the cluster	Atchutapuram Road, Machavaram, Rayavaram Mandal-533261
4	Number of Units	119 Units (100% Micro Units)
5	Geographical spread	Majority of the Members are located within 10 km
6	Total Employment Direct/Indirect	**Direct – 595** Indirect –1500
7	Products of the cluster	Pulses and Pulses Products of Different Varieties like • Red gram (tur dhal) • Green gram (mung dhal) • Black gram (urad dhal) • Bengal gram (chana dhal) • (lentil) • Toor Dal • Mix Dal Flour for Dosa, Wada • Baby Mix Dal Food Products
8	Technology used in the cluster	Conventional techniques/ Equipments/machineries for cleaning and Hulling of Pulses and Grinding.
9	Turnover of the cluster	Rs. 77.00 Crores (2018-19)
10	Market Domestic/Export	• Direct Market: Domestic • Indirect Market: Export through Traders Network
Units Details		
11	Total Number of units	119
12	Micro units	100% Micro
13	Small	Nil
14	Scale of Investment in each unit	Rs 5 to 10 lakh rupees
15	Average Employment per unit men/women	5 Women=2

		Men=3
16	Average annual turnover	Rs. 65 lakhs
17	No. of units doing Export	Nil, indirect export through traders
Information Related to SPV		
18	Name of the SPV	Sri Mahalakshmi Pulses Mills Cluster Association
19	Registration Number	AP15 48383235
20	Type of Registration	Registration under The Registrar of Societies, Kakinada.
21	Nature of SPV	Open type
22	Number of Units in Cluster	119
23	Total Board Of Directors	7
24	Total Members Participating Directly/Contributors	SPV Members:110 Non SPV Members: 9
25	Contribution Raised So Far	Rs. 10 Lakhs
26	Share Holding Pattern	equal
Raw Material Availability		
28	Andhra Pradesh is one of the important pulse-growing states in India with **an area of 19.49 lakh hectares** with a production of **16.23 lakh tones annually as per IPNI Data for 2012-13.** The important pulses grown in Andhra Pradesh are **Bengal gram, black gram, Red gram and Green gram.** The area in Andhra Pradesh represents 6 per cent of the total area in the country. The Andhra Pradesh state ranks seventh in area and eighth in production.	
Market Potential		
29	Market of The Cluster Products (Domestic/Export)	**Huge Domestic National Market** To meet the demand of pulses, India is at present importing about 4.02 million tons. In order to ensure self- sufficiency, the pulse requirement in the country is projected at 32 million tons by the year 2030 which necessitates an annual growth rate of 4.2%. The gap of 4.5 million to 5 million tons is bridged with imported pulses. The gap between supply and demand has been growing every year due to increase in population as well as consumption. Thus it is very essential to upgrade India's post-harvest processing capacity to save the wastage of pulses due to lack of processing, the CFC with advance machinery will help in minimizing the wastage of pulses during processing by up to 30%.

30	Specialty of The Products	The potential of pulses to help address future global food security, nutrition and environmental sustainability needs has been acknowledged through the UN declaration of the 2016 International Year of Pulses. Pulses are a Smart Food as these are critical for food basket (dal-roti, dal-chawal), important source of plant protein and help address obesity, diabetes etc.
31	Value Addition	Little value addition taking place in the Cluster due to lack of technology. however there is a good scope for value addition utilizing the bye- products of the pulses processed. Like preparation of ready to eat and ready to cook items which have huge urban demand.

Other Information	
32	Pulses are one of the important food crops globally due to higher protein content. Pulses are an important group of crops in India, which is also responsible for yielding large financial gains by amounting for a large part of the exports. Pulses are the major sources of protein in the diet. Of all categories of people pulses form an integral part of the Indian diet, providing much needed protein to the carbohydrate rich diet. India is the largest producer of pulses in the world. quite low at 781 kg/ha which might be due to policy neglect. ***The post green revolution era saw a sharp decline in per capita production and availability of pulses with record 4.0 million tones imports of pulses in 2012-13.*** ***The country would require 39 million tonnes of total pulses by 2050, which will require pulses production to grow at an annual rate of 2.2%.*** To fulfill the growing requirement, the country has to produce enough pulses as well as remain competitive to protect the domestic production. There is scope for a lot of enhancement in pulses Processing productivity. ***This will, however, require a paradigm shift in research, technology generation and***

	dissemination, popularization of improved crop management practices, commercialization, Post Harvest Processing and Storage along with capacity building of the stakeholders in frontier areas of research. ***The lack of advanced processing and waste minimization technologies adoption by the processing industries is one of the major issues in the poor performance of pulses market. Government interventions in the pre processing and post processing sector would provide adequate support in achieving sustainability of the pulses demand.*** The cluster is having good availability of raw material and the CFC can become a bench mark for other similar pulses growing regions.
DSR Findings	
33. Major Problems and Key Technology Missing in the Cluster	The following are the main findings of DSR ❖ Good Collaboration and Organizational Practice of the Cluster Members ❖ Prolonged process ❖ Lack of Pulses drying machineries ❖ Lack of Fine Cleaning and grading facility ❖ Lack of Pulses polishing and Sorting facility ❖ Poor packaging practices ❖ Testing facility not available in the cluster region ❖ Regional marketing presence, lack national market reach, Dominance of Traders ❖ Lack of Storage Facilities ❖ Poor Value Addition and Product Diversification ❖ Lack of Research and Training Facility
DSR Recommendations	
34. Soft Interventions	The DSR has found that the Cluster members are aware of the Cluster Scheme and Few Programs of Soft Interventions have been organized by MSME Hyderabad. The cluster members have also visited

	few existing clusters as a part of study tour and hence the DSR does not recommend any soft intervention for the cluster. The DSR found that the cluster members are ready to take up hard interventions and hence recommended.
35. Hard Interventions recommended by the DSR	The DSR recommends the establishment of Common Facility Centre with following Hard Interventions ❖ CFC with Automatic Pulses dryers ❖ CFC with Automatic Fine Cleaning and Size Grading Facility ❖ CFC with Automatic Color Sorting Facility ❖ CFC with Automatic Pulses Polishing Machine ❖ Common Packaging center with Automatic Pouch and Bag Packing Machines ❖ Common testing facility for Pulses of BIS and FSSAI Standards ❖ Common marketing and Export Centre. ❖ Cold Storage Facility. ❖ Value Added Product Development Centre ❖ Pulses Processing Research and Training Centre

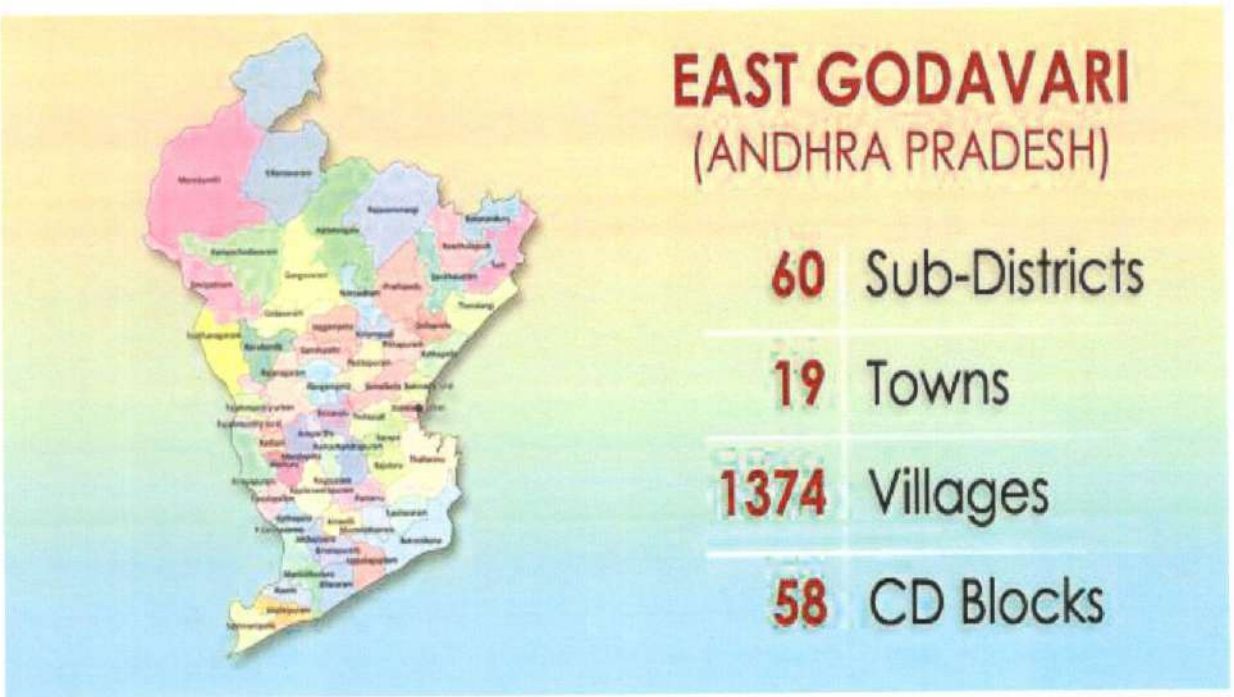
Chapter 2

Brief Overview of East Godavari District

2.1 Introduction

East Godavari district or Toorpu Godavari jilla is a district in Coastal Andhra region of Andhra Pradesh, India. The District is a residuary portion of the old Godavari District after West Godavari District was separated in 1925. As the name of the district conveys, East Godavari District is closely associated with the river Godavari, occupying a major portion of the delta area.

The Headquarters of the District is located at Kakinada. East Godavari District lies North - East Coast of Andhra Pradesh and bounded on the North by Visakhapatnam District and the State of Orissa, on the East and the South by the Bay of Bengal and on the West by Khammam and West Godavari Districts. As of Census 2011, it became the most populous district of the state with a population of 5,151,549. Rajahmundry and Kakinada are the two largest cities in the Godavari districts in terms of population.



Area of the District is 10,807 Sq.Kms. The District is located between Northern latitudes of 16o 30' and 18o 20' and between the Eastern longitudes of 81o 30' and 82o 30'. It has a population of 48.73 lakhs as per 2001 Census. The District consisting of 5 Revenue Divisions viz.,

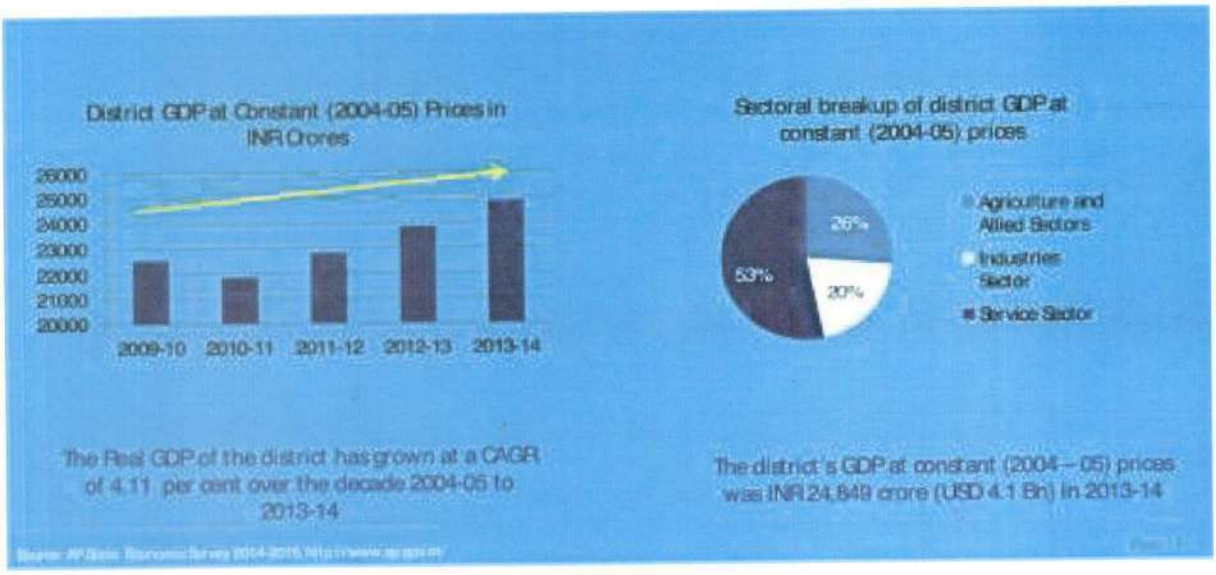
- Kakinada
- Rajahmundry
- Peddapuram
- Rampachodavaram
- Amalapuram.

2.2 Economic Occupational Structure Background

The Gross District Domestic Product (GDDP) of East Godavari is ₹52,294 crore (US$8.0 billion) and it contributes 10% to the Gross State Domestic Product (GSDP). For the FY 2013–14, the per capita income at current prices was ₹78,255 (US$1,200). The primary, secondary and tertiary sectors of the district contribute ₹16,093 crore (US$2.5 billion), ₹10,857 crore (US$1.7 billion) and ₹25,343 crore (US$3.9 billion) respectively. The major products contributing to the GVA of the district from agriculture and allied services are, paddy, sugarcane, betel leaves, coconut, milk, meat and fisheries. The GVA to the industrial and service sector is contributed from construction, electricity, manufacturing, unorganised trade and transport. The discoveries of oil and natural gas, it has increased its industrial sector. It is home to two major fertiliser factories and in addition, gas based power plants and oil refineries. Now it is one of the largest oil & gas hubs in India. The Real GDP of the district has grown at a CAGR of 4.11 percent over the decade 2004-05

The Gross District Domestic Product (GDDP) of East Godavari is ₹52,294 crore (US$8.0 billion) and it contributes 10% to the Gross State Domestic Product (GSDP). For the FY 2013–14, the per capita income at current prices was ₹78,255 (US$1,200). The primary, secondary and tertiary sectors of the district contribute ₹16,093 crore (US$2.5 billion), ₹10,857 crore (US$1.7 billion) and ₹25,343 crore (US$3.9 billion) respectively. The major products contributing to the GVA of the district from agriculture and allied services are, paddy, sugarcane, betel leaves, coconut, milk, meat and fisheries. The GVA to the industrial and service sector is contributed from construction, electricity, manufacturing, unorganised trade and transport. The discoveries of oil and natural gas, it has increased its industrial sector. It is home to two major fertiliser factories and in addition, gas based power plants and oil refineries. Now it is one of the largest oil & gas hubs in India. The Real GDP of the district has grown at a CAGR of 4.11 percent over the decade 2004-05

Source: AP Socio Economic Survey 2014-2015, http://www.ap.gov.in/



2.3 Industries

There are around 24 Industrial Estates in the East Godavari District.

The industrial sector in the district includes:

- Mining & Quarrying
- Manufacturing (Registered & Unregistered)
- Construction

Construction is the predominant industry with a GVA of Rs 3,378 crore (US $ 552 million) followed by a growing manufacturing industry with a GVA of Rs. 2,557 crore (US $ 418 million) The Mining and Quarrying industry comes in third at a GVA of Rs. 1,348 crore (US $ 220 million)

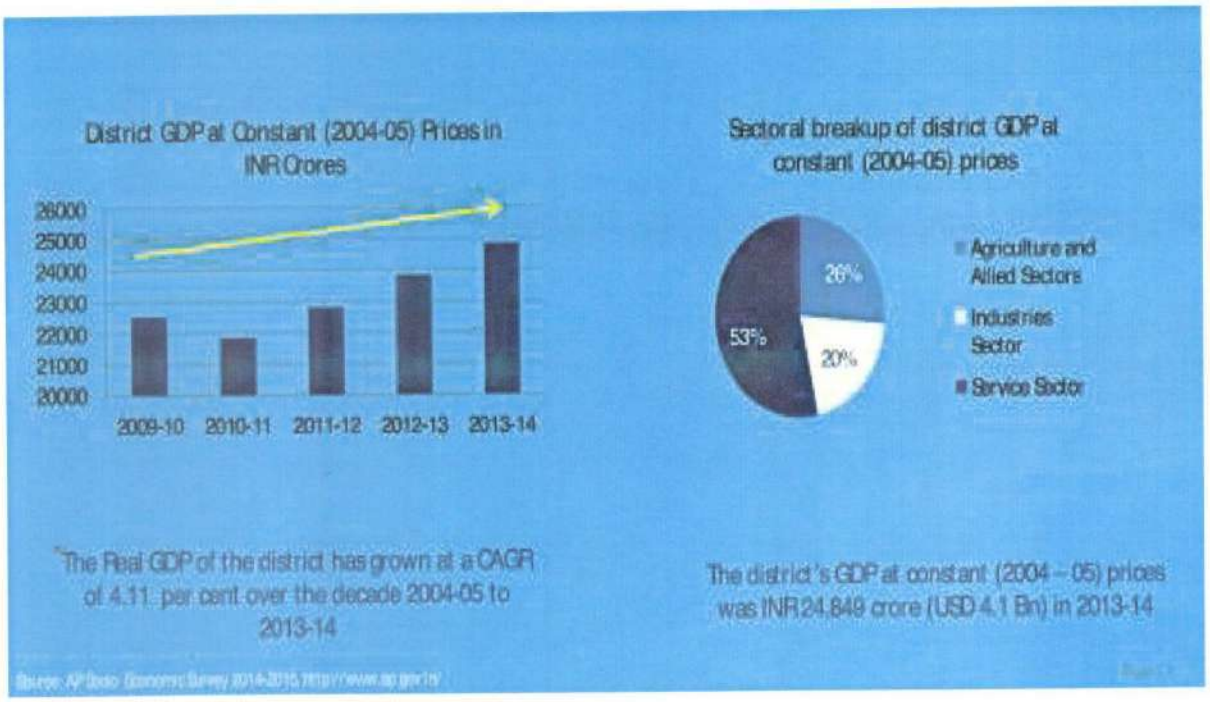
The primary, and secondary sectors of the district contribute ₹16,093 crore (US$2.5 billion) and ₹10,857 crore (US$1.7 billion) respectively. The major products contributing to the GVA of the district from agriculture and allied services are, paddy, sugarcane, betel leaves, coconut, milk, meat and fisheries.

The GVA to the industrial and service sector is contributed from construction, electricity, manufacturing, unorganised trade and transport.

PARTICULARS	INVESTMENT (INR CRORE)	EMPLOYMENT (Nos)
Large & Mega Industrial Projects established	13,836	49,873
Micro Small and Medium Enterprises established	2,039.85	1,21,939

Sr. No	HEAD	UNIT	PARTICULARS
1	REGISTERED INDUSTRIAL UNIT	No.s.	2,743
2	TOTAL INDUSTRIAL UNIT	No.s.	2,743
3	REGISTERED MEDIUM & LARGE UNIT	No.s.	156
4	ESTIMATED AVG. NO. OF DAILY WORKER EMPLOYED IN SMALL SCALE INDUSTRIES	No.s.	20,565
5	EMPLOYMENT IN LARGE AND MEDIUM INDUSTRIES	No.s.	31,497
6	NO. OF INDUSTRIAL AREA	No.s.	24
7	TURNOVER OF SMALL SCALE IND.	IN LACS	NA
8	TURNOVER OF MEDIUM AND LARGE SCALE INDUSTRIES	IN LACS	NA

Source: Ministry of MSME



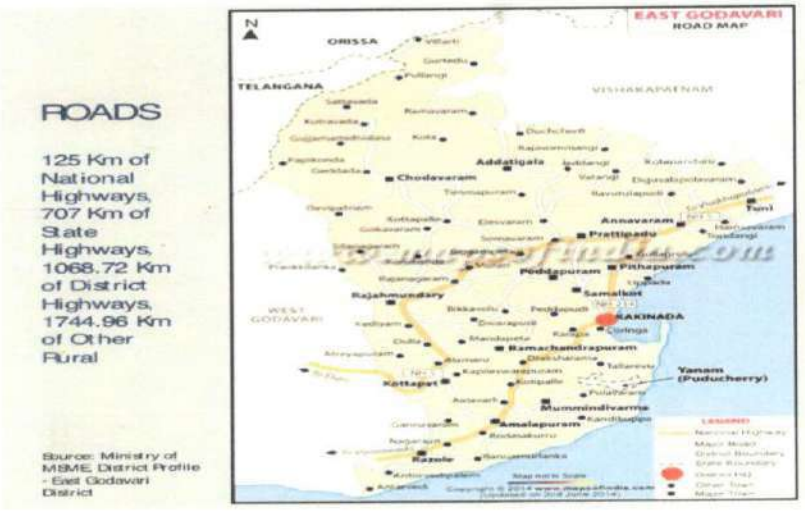
2.4 Infrastructure

The total of core road network of the district is 1,274.067 km (791.669 mi). It includes, 613.289 km (381.080 mi) of existing and a proposed length of 660.780 km (410.590 mi).

The total rail network of the district is 171.34 km (106.47 mi).
The National Highway 5 connecting Chennai and Howrah passes through this district. Rajahmundry, Tuni and Samalkot are the railway junctions in the district. The Chennai to Howrah rail line also passes through this district.

Roadways

Kakinada is connected to Visakhapatnam (152 Km) via NH 5, to Hyderabad (489 Km) via NH 9 and NH 5, to Bangalore(880 Km) via AH 45

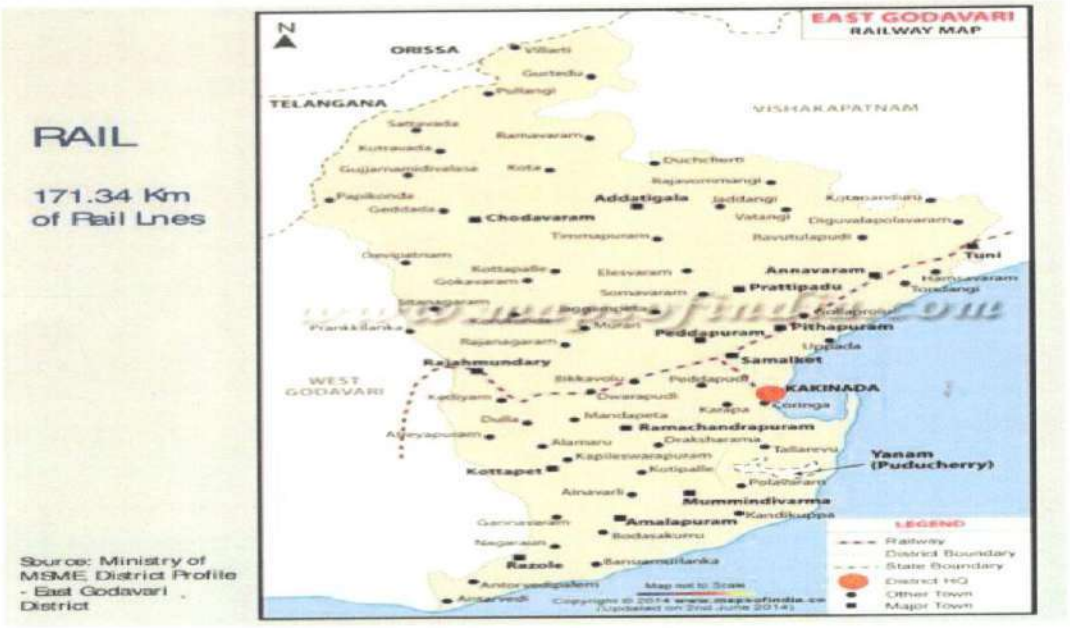


Railways

► Kakinada is a railway terminus. It has four railway stations.

► Through a branch line, Kakinada is connected to Samalkot Junction (13 km) which is

on the Chennai-Howrah trunk line, where almost all express trains stop to connect Kakinada with the important places of the country



Airways

The nearest airport is located at Rajahmundry, about 65 km from Kakinda. Rajahmundry City Airport has services to Chennai, Hyderabad, Vijayawada and Bangalore. Nearest major airport is at Visakhapatnam at 145 km

Agriculture

The main occupation of the district is agriculture where more than 24% of the population is engaged. At the same time more than 60% of the population are non-workers which is a potential force available for self-employment and industrial purposes. Paddy is the main crop, which occupies more than 50% of the area and also dominates in yield and production in comparison to all other crops.

The district also tops the production of coconut and banana cultivation in the State. The main source of irrigation is canals followed by tube wells. and tanks, Godavari Central Delta and Godavari Eastern Delta are the main source of major irrigation.

East Godavari District has got the unique distinction of having marine, inland and brackish water pisciculture. It has a coastline of 144 kms. Fire clay, china clay, Graphite and Laterite are the important mineral resources available and clusters of industries based on these minerals are flourishing in the district.

2.5 Geography and climate

East Godavari district occupies an area of 10,807 square kilometres (4,173 sq mi), comparatively equivalent to Indonesia's Sumba Island. The district has hilly terrain to the west and plains to the east. To the east of the district lies the Bay of Bengal. The district headquarters Kakinada lies on the coast. The district receives rainfall from June to October; both southwest and northeast monsoon contribute to the rainfall. Average rainfall varies widely from 100 centimetres at the northern part of the coast to 140 centimetres at the extreme western parts of the hills.

2.6 Resources

East Godavari is famous for **agriculture** because of fertile lands which are adequately irrigated throughout the year. Thanks to Sir Arthor Cotton Who turned entire Godavari region to fertile position with his wonderful engineering mind, he constructed **Dowlesawaram Barrage** Across the river Godavari. And it is the most prosperous district in the state and is the one of richest district in the country. Statistically it is a potential hinterland for **oil and natural gas reserves** in the country as many areas are identified as richest sources for oil and Natural gas in Godavari basin.

2.7 Culture

The culture of East Godavari district is a rich traditional one in all parts of the district, and reflects the true culture of Andhra Pradesh. It is known for Veda-pandits, the Godavari River and the hospitality of the people. The Telugu language originated in this district (in Rajahmundry or Rajamahendri). East Godavari District has produced several stalwarts in area of culture, music, art and cinema. Poet and writer Devulapalli east godavarisastri, famous Musician and Singer M.Balamuralieast godavari (Mangalampalli Balamurali east godavari), P.B. Srinivas, Adurthi Subba Rao, C. Pullaiah, actress Jaya Prada belong to this district, freedom fighter, social worker and politician Durgabai Deshmukh.

2.8 Divisions

The district is divided into 6 revenue divisions and 60 revenue Mandals among which 58 are rural and 2 are urban. The district has 57 Mandal Praja Parishads and 1,011 Gram Panchayats and nine municipalities and two municipal corporations. Total number of villages in the district is 1,379.

2.9 Education

The primary and secondary school education is imparted by government, aided and private schools, under the School Education Department of the state. As per the school information report for the academic year 2015-16, there are a total of 5,986 schools. They include, 29 government, 3,452 mandal and zilla parishads, 1 residential, 1688 private, 2 model, 12 Kasturba Gandhi Balika Vidyalaya (KGBV), 285 municipal and 517 other types of schools. The total number of students enrolled in primary, upper primary and high schools of the district are 722,123.

PARTICULARS	NUMBER OF INSTITUTES 2014-15	TOTAL STUDENTS 2014-15
Govt. Degree Colleges	15	10279
Private Aided Degree Colleges	11	10469
Junior Colleges in the State 2013-14	362 (Number of Institutes)	

Source: Andhra Pradesh, Socio economic survey – GoAP 2014-15,

http://www.ap.gov.in

PARTICULARS	NUMBER OF INSTITUTES (2014-15)	TOTAL INTAKE (2014-15)
Engineering Colleges	67	32660
MBA Colleges	70	490
MCA Colleges	41	2800
M. Tech Colleges	46	2233

Source: Andhra Pradesh, Socio economic survey – GoAP 2014-15,

http://www.ap.gov.in

District has universities located at Rajahmundry City such as Adikavi Nannaya University Rajahmundry, Telugu University, Acharya NG Ranga Agricultural University. There are numerous educational institutes with Jawaharlal Nehru Technological University, Kakinada, District Institute of Education and Training (DIET) in Rajahmundry, established in 1989 for the benefit of teacher trainees and in-service teachers. There are many educational institutions that provide education in different fields such as Engineering, Medical, Law, Pharmacy, Polytechnic and Postgraduate colleges etc. Some of the notable universities, colleges are Rangaraya Medical College in Kakinada and Govt Pithapuram Rajah College, Kakinada.

2.10 Demographics

According to the 2011 census East Godavari district has a population of 5,154,296.[10] This gives it a ranking of 19th in India (out of a total of 640 districts) and 2nd in the state. The district has a population density of 477 inhabitants per square kilometre (1,240/sq mi). Its population growth rate over the decade 2001–2011 was 5.1%. East Godavari has a sex ratio of 1005 females for every 1000 males, and a literacy rate of 71.35%.

East Godavari district has a total population of 51,51,549; 25,69,419 and 25,82,130 male and female respectively. There was change of 5.10 percent in the population compared to population as per 2001 census. The census data states a density of 477 in 2011 compared to 454 in 2001.[11] Average literacy rate of East Godavari in 2011 was 71.35% compared to 65.48% in 2001. On a gender basis, male and female literacy was 74.91% and 67.82% respectively. With regards to sex ratio in East Godavari, it stood at 1005 per 1000 males compared to the 2001 census figure of 993. The average national sex ratio in India is 940 as per the 2011 census.[citation needed] There were total 4,92,446 children under the age of 0-6 against 6,13,490 of 2001 census. Of total 492,446 male and female were 2,50,086 and 2,42,360 respectively. The child sex ratio as per census 2011 was 969 compared to 978 in 2001. In 2011, children under 0-6 formed 9.56% of East Godavari district compared to 12.52% in 2001.

2.11 Household indicators

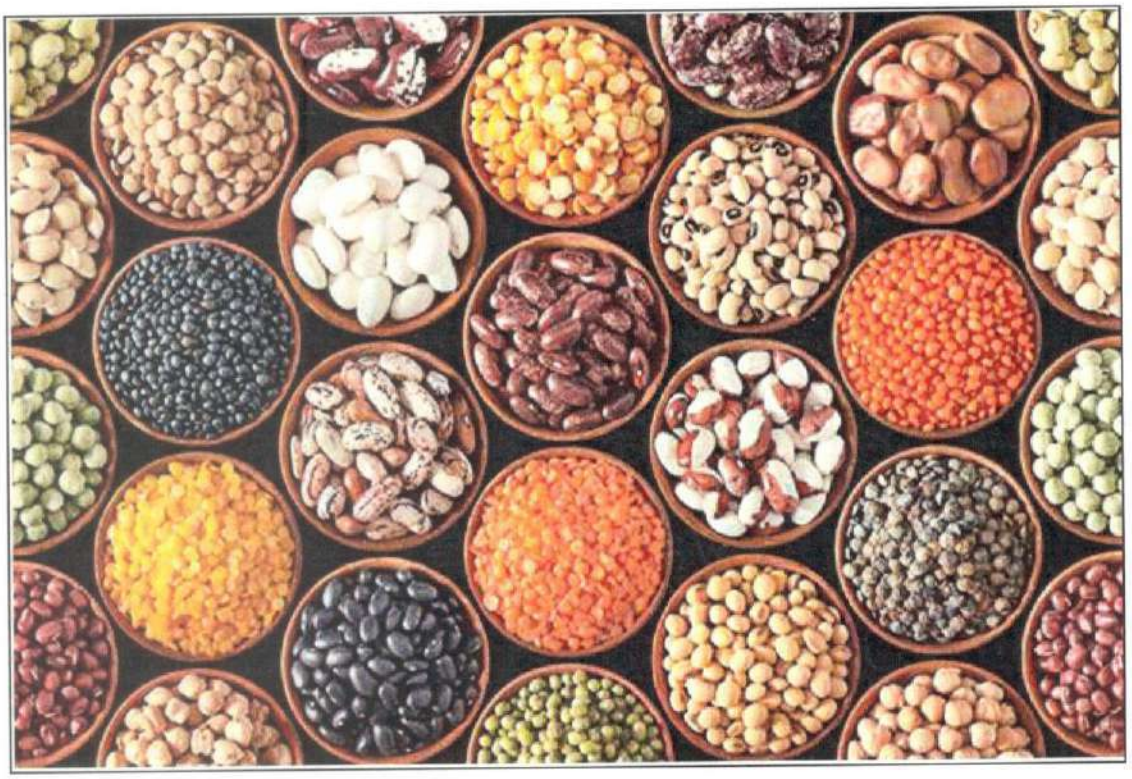
In 2007–2008 the International Institute for Population Sciences interviewed 1019 households in 38 villages across the district.[12] They found that 92.5% had access to electricity, 96.7% had drinking water, 50.4% toilet facilities, and 30.9% lived in a pucca (permanent) home.[12] 28.6% of girls wed before the legal age of 18 and 79% of interviewees carried a BPL card.[12]

- East Godavari District's literacy rate of its urban population is 80.78 per cent which is much above the national average
- The district's literacy rate has grown from 65.48 per cent to 70.99 per cent over the years 2001 – 2011
- The district's population constitutes over 6 per cent of the state's population
- The district has a progressive sex ratio of 1006

Chapter 3

Overview of Pulses Industry

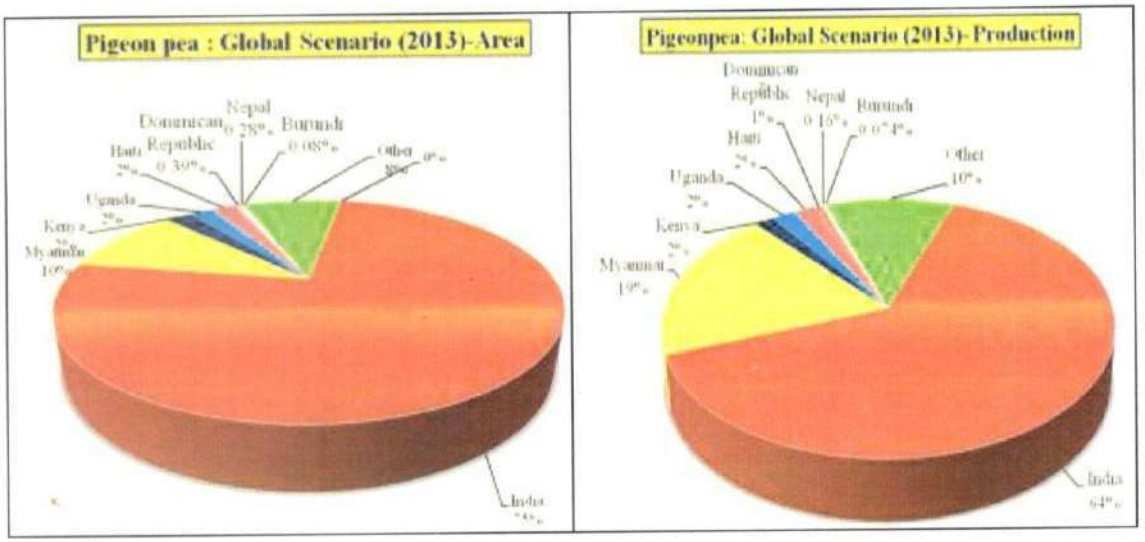
3.1 Pulses Industry Global Scenario



Pulses are the important crops in the farm production system as they add nitrogen in the soil and provide food and nutritional security to large number of vegetarian population. Pulses are annual leguminous crops yielding between one and 12 grains or seeds of variable size, shape and colour within a pod, used for both food and feed. The term "pulses" is limited to crops harvested solely for dry grain, thereby excluding crops harvested green for food, which are classified as vegetable crops, as well as those crops used mainly for oil extraction and leguminous crops that are used exclusively for sowing purposes.

Pulses are grown in virtually every corner of the globe. They have a strong history of nourishing people around the world for centuries. Along with the early cereal grains, pulses were among the first crops cultivated as far back as 11,000 years ago.

In the past three decades, global pulse production has grown rapidly. In the past ten years alone, the world has produced between 50 and 60 million tonnes of pulses each year.



As of 2015, the world's biggest producers of pulses were **India, Canada, Myanmar, China, Nigeria, Brazil, Australia, USA, Russia, and Tanzania,** while the world's most important pulse exporters also include **Argentina, France, Ethiopia, and Turkey.** Overall there were nearly 173 countries in the world that grew and exported pulses between 2010 and 2013. Besides serving as an important source of protein for a large portion of the global population, pulses contribute to healthy soils and climate change mitigation through their nitrogen-fixing properties.

Global Pulses Production

World Pulse Production Summary

(metric tons)

Production (MT)	2016	2017	2018
Beans, dry	22,458,000	22,846,000	22,427,400
Broadbeans	4,247,000	4,272,000	4,160,400
Chick peas	12,789,800	14,136,600	12,585,476
Cow peas, dry	5,639,000	5,759,000	5,609,000
Lentils	6,679,000	5,719,000	5,236,800
Lupins	1,055,000	1,039,000	1,012,000
Peas, dry	14,039,000	12,726,000	11,495,000
Pigeon peas	4,180,000	4,115,000	4,007,800
Vetches	862,000	865,000	842,400
Bambara beans	143,000	143,000	139,600
Pulses, nes	3,531,000	3,511,000	3,419,400
Total	75,622,800	75,131,600	70,935,276
Area (hectares)	2016	2017	2018
Beans, dry	28,039,000	28,060,000	27,811,000
Broadbeans	2,496,927	2,514,872	2,408,444
Chick peas	13,631,323	14,876,973	14,378,794
Cow peas, dry	11,012,702	11,081,977	10,590,089
Lentils	2,309,187	2,168,758	1,923,108
Lupins	876,479	855,556	820,140
Peas, dry	3,072,845	3,010,927	2,615,136
Pigeon peas	5,333,620	5,206,289	5,006,260
Vetches	558,611	564,173	536,408
Bambara beans	200,789	200,835	193,475
Pulses, nes	4,780,828	4,717,471	4,536,375
Total	72,312,310	73,257,830	70,819,228

India is the world's largest producer of pulses; but last year the country had to import 1.8 million tones of pulses to meet the growing domestic consumption. During the year 2006-07, India imported 1.8 million tonnes of various pulses, especially from countries like China, Canada and Australia. For instance, the Kolkata Dock System alone handled over a million tonnes of pulses imported from these countries. This was a nearly 90 per cent jump over the previous year and over 50 per cent of the country's total import of pulses.

Despite being the largest producer of the largest varieties of pulses, the demand for consumption of pulses is just growing. This has led to a spurt in the prices of pulses in markets that have have risen by Rs 5-7 per kg. Unable to keep prices under control, the Manmohan Singh government haddecided to import a further 1.5 million tonnes of the commodity. The government has also decided to do away with import duties for pulses.

India is the world's largest pulse producer accounting for 27-28 per cent of global pulse production. India harvests between 12- 15 million tonnes of pulses each year but the yield has been pretty much static for the last 30 years averaging between 500-600 lb./ acre.

While the green revolution produced a three-fold increase in wheat yields in India, pulses have not received the same level of attention in research. Pulses are grown on dryland during the winter season under less than ideal conditions. All of the pulses in India are harvested by hand but losses due to insects and storage problems can be significant.

What makes India such an interesting market is that India is best described as a very price sensitive market. There is a great deal of substitutability between pulse crops. If pigeon peas are high priced, more yellow peas will be consumed. If desi chickpeas are low priced, more chickpeas will be consumed. This dynamic pulse consumption pattern combined with the large, and sometimes variable, domestic production makes Indian market demand difficult to predict on a year-to-year basis.

Last year, the government banned the export of pulses to ensure that people have enough stocks of the commodity to eat. The ban applied to over 10 types of pulses, guarseed, lentils and split ones too. The pulses that are covered under the ban are chickpea, dried leguminous vegetables, including shelled ones, peas, black matpe (urad), arhar (pigeon pea), small red beans, broad beans, red kidney beans and split beans.

According to Food and Agriculture Organisation (FAO) data, the global pulses production which was approximately 61 million tons in 2005, 2006 and 2007 reached 62,7 million tons in 2008, 64,2 million tons in 2009 and 70,6 million tons in 2010. Decreasing to 69,2 million tons in 2011, production amount increased again to 75,1 million tons in 2012. Increase trend in pulses production continued in the following years; and production increased to 77,2 million tons in 2013 and 77,6 million tons in 2014.

It is seen that growth in both cultivation areas and efficiency affected this increase; because pulses cultivation area which was 71 million hectares in 2005 exceeded 85 million hectares in 2014. At the same time, efficiency which was 8 thousand 533 hectoliters per hectare reached 9 thousand 65 hecto liters in 2014.

When we look at the production of pulses in 2014 on country basis, it is seen that India has the first position in world production. India produced 14 million tons of pulses in 2009 and has raised this amount over 17 million tons in 2010 and 2011. The amount of production in the country dropped to 16.7 million tons in 2012 and it increased again to 18.3 million tons in 2013. It continued to increase in 2014 and reached 19,9 million tons. India is immediately followed by Canada, which increased its annual average pulses production of 5 million tons to 6.1 million tons in 2013. However the production amount decreased again to 5,8 million tons in 2014. The world's third largest producer of pulses is Myanmar, which realised pulses production with an amount of about 5 million tons in 2013 and 2014.

In general, pulses are grown all over the world. When observed in a basis of continents, it is evident that the highest pulses production in 2014 was in the continent of Asia with 35,1 million tons. Asia is followed immediately by Africa with 17 million tons. The continent of America has the third place with 15.3 tons of production in 2014. 6,9 million tons were produced in Europe, whereas it is around 3,1 million tons in Oceania.

3.2 Product Based World Pulses Production

Countries have focused on one or two items of pulse production. In general terms, dry beans are the most produced pulses all over the world. The world production of dry beans was approximately 21 million tons in 2009, increased to 24 million tons in 2010 and decreased by an amount to about 23 million tons in 2011-12-13. In 2014, the production increased again and reached 25 million tons which is the highest amount of the last 6 years. The Asian continent is the first in world dry bean production. In 2014, 10.6 million tons of dry bean production was carried out in the Asian continent, it is followed by the Americas in the same year by 7,7 million tons and Africa by 5.9 million tons.

Chickpeas have the second place after dry beans for pulses production in the world. In 2009, the world chickpea production was 10.4 million tons and it was around 11 million tons in 2010-2011 and 2012.

According to FAO data, the world chickpea production reached 13.3 million tons in 2013 and 14,2 million tons in 2014. Asia is dominant in the world chickpea production as well as seen in dry beans.

It is even possible to say that, almost the entire chickpea production is realised in the Asian continent. That's because, according to data from 2014, 11,9 million tons of a total of 14.2 million tons of world chickpea production was carried out in Asia. Asia is followed by Oceania with production of 817 thousand tons, Africa with 765 thousand tons of production, America with 478 thousand tons of production and Europe with 174 thousand tons of production.

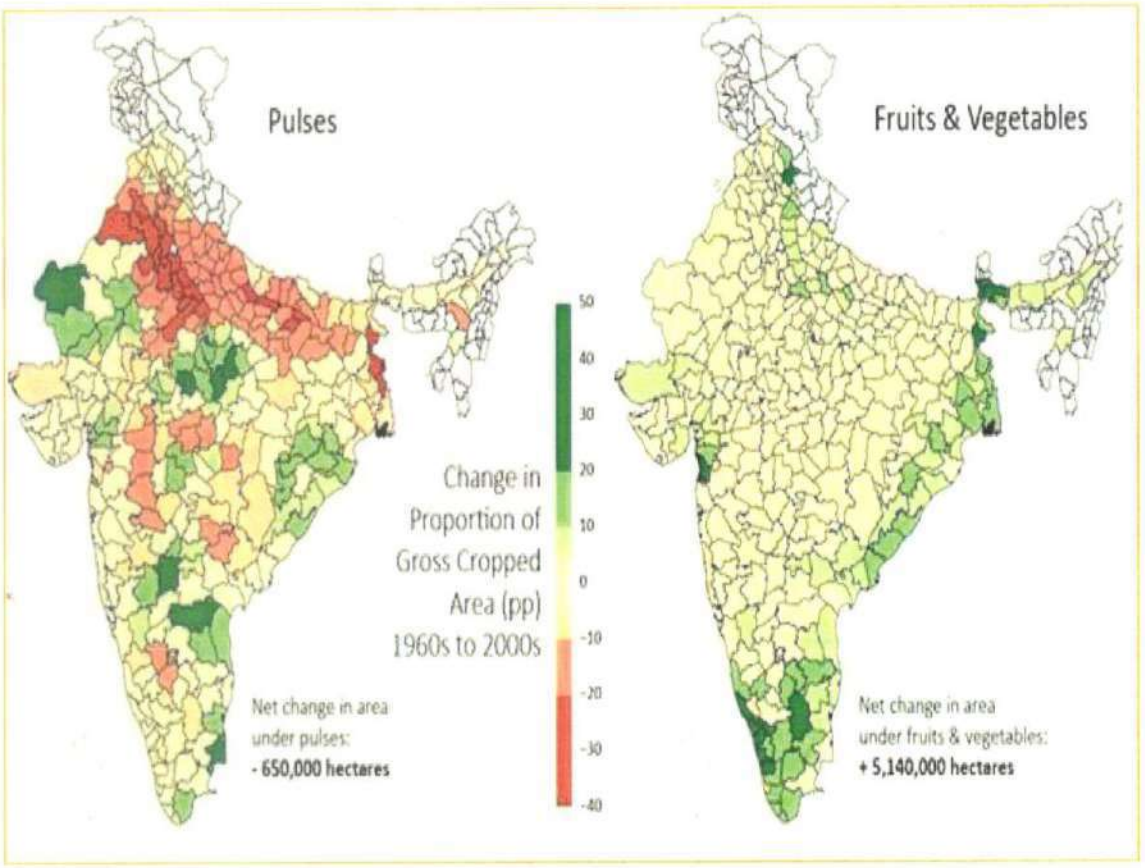
Following dry beans and chickpeas, the third most produced pulses in the world are dry peas. In 2009, 2010, 2011 and 2012 world production of dry peas was around 10-11 million tons, this reached to 11.4 million tons in 2013 and decreased to 11.3 million tons in 2012.

According to the 2014 data, the largest share of dry pea production in the world was owned by American continent with 4.4 million tons. In the same year, America is followed by Europe with 3,3 million tons, Asia with 2.5 million tons and Africa with 656 thousand tons.

3.3 Pulses Production in India

India is the largest producer (25% of global production), consumer (27% of world consumption) and importer (14%) of pulses in the world. Pulses account for around 20 per cent of the area under foodgrains and contribute around 7-10 per cent of the total foodgrains production in the country. Though pulses are grown in both Kharif and Rabi seasons, Rabi pulses contribute more than 60 per cent of the total production.

Gram is the most dominant pulse having a share of around 40 per cent in the total production followed by Tur/Arhar at 15 to 20 per cent and Urad/Black Matpe and Moong at around 8-10 per cent each. Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh and Karnataka are the top five pulses producing States. Productivity of pulses is 764 kg/ha.



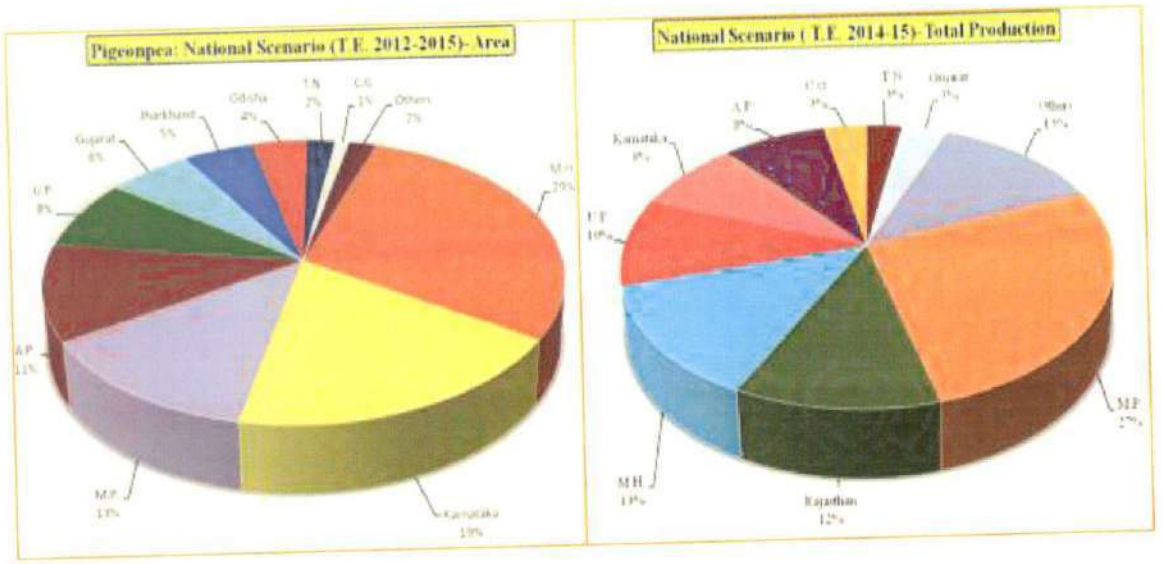
Since ages, pulses have been well integrated into the farming system of our country as the farmers could produce them by using their own seeds and family labour without depending much on external inputs. With the advent of Green Revolution, which promoted rice and wheat using external inputs and modern varieties of seeds, pulses were pushed to the marginal lands.

This resulted in decline in productivity and land degradation. Thus, pulses are still cultivated on the marginal and sub marginal land, predominantly under unirrigated conditions. The trend of commercialisation of agriculture has further aggravated the status of pulses in the farming system.

3.4 Important Major Pulses Growing Zones / States in India

Varietal Development programme of pulses got strengthened in 1967 with the initiation of All-India Co-ordinated Research Improvement Programme. Through this programme, the varieties suitable for across the country.

Agro-climatic zones: Northern Hills Zone – J&K, Himachal Pradesh, North West of Uttar Pradesh; North West Plain Zone – Haryana, Punjab, Rajasthan, Gujarat, western Uttar Pradesh; North East Plain Zone – eastern Uttar Pradesh, Bihar, West Bengal, Assam, Tripura, Mizoram, Northern Odisha; Central Zone – Madhya Pradesh, Maharashtra, Parts of Karnataka, Andhra Pradesh; South Zone – Andhra Pradesh, Tamil Nadu, Kerala, Karnataka and southern Odisha have been developed.



Bengal Gram (Desi Chick Pea / Desi Chana), Pigeon Peas (Arhar / Toor / Red Gram), Green Beans (Moong Beans), Chick Peas (Kabuli Chana), Black Matpe (Urad / Mah / Black Gram), Red Kidney Beans (Rajma), Black Eyed Peas (Lobiya), Lentils (Masoor), White Peas (Matar) are major pulses grown and consumed in India.

Although, being the largest pulse crop cultivating country in the World, pulses share to total food-grain is production is only 6-7% in the country. The cultivation of pulses builds- up a mechanism to fix atmospheric nitrogen in their root nodules and thus meet their nitrogen requirements to a great extent.

In India, pulses can be produced with a minimum use of resources and hence, it becomes less costly even than animal protein. In comparison to other vegetables, pulses are rich in protein which are less expensive and can be cultivated as an inter-crop and also as mixed crop.

Pulses are mostly cultivated under rain-fed conditions and do not require intensive irrigation facility and this is the reason why pulses are grown in areas left after satisfying the demand for cereals/cash crops. Even in such conditions, pulses give better returns. Apart from this, pulses possess several other qualities such as they are rich in protein, improve soil fertility and physical structure, fit in mixed/inter-cropping system, crop rotations and dry farming and provide green pods for vegetable and nutritious fodder for cattle as well.

Although this crop group is more important from the nutritional point of view, there has not any significant increase in area and production during 1950-51 to 2009-10, however, significant growth in area and production has been recorded during the last five years (i.e. 2010-2011 to 2014-15). With the increase in infrastructural and irrigation facilities/resources, the pulses get the marginalised treatment pushing them to another poor and marginal land piece.

The productivity of pulses has increased about 68% at 764 kg/ha during 2013-14 from the level of 441 kg/ha during 1950-51. It is imperative to mention that the New Agriculture Technology (NAT) introduced during mid-sixties has increased the production of food-grains from 50.82 million tonnes during 1950-51 to 265.64 million tonnes during 2013-14 with the increase in area from 97.32 million hectares to 125 million hectares. The productivity of food grains has also sharply increased to 2120 kg/ha during 2013-14 from the level of only 522 kg/ha during 1950-51.

The potential of pulses to help address future global food security, nutrition and environmental sustainability needs has been acknowledged through the UN declaration of the 2016 International Year of Pulses.

Pulses are a Smart Food as these are critical for food basket (dal-roti, dal-chawal), important source of plant protein and help address obesity, diabetes etc. In addition pulses are highly water efficient, can grow in drought prone areas and help improve soil fertility by fixing soil nitrogen.

Pulses are grown in all three seasons. The three crop seasons for the commodity are:

i. **Kharif** – Arhar (Tur), Urd (Blackgram), Moong (Greengram), Lobia (Cowpea), Kulthi (Horsegram) and Moth;

ii. **Rabi** – Gram, Lentil, Pea, Lathyrus and Rajmash

iii. **Summer** – Greengram, Blackgram and Cowpea

Maharashtra (12%), Rajasthan (11%), Andhra Pradesh (9%) and other states together (30%). Chickpea, pigeon pea, lentil, mung bean, urad bean and field pea are major pulses grown and consumed in India. Among the pulses, chickpea contributed 48%, Pigeonpea 17%, blackgram 10%, greengram 7% and other pulses 18% towards total pulses production. The total consumption of various pulses and pulses products in India is about 21-22 million tonnes. India's annual interim pulse production is about 18.45 million covering an area of about 23.47 million hectare majority of which falls under rainfed, resource poor and harsh environments frequently prone to drought and other abiotic stress condition.

To meet the demand of pulses, India is at present importing about 4.02 million tons. In order to ensure self- sufficiency, the pulse requirement in the country is projected at 32 million tonnes by the year 2030 which necessitates an annual growth rate of 4.2%. The gap of 4.5 million to 5 million tons is bridged with imported pulses. The gap between supply and demand has been growing every year due to increase in population as well as consumption. India's demand-supply gap is bridged by imports from countries like Canada, Australia, Myanmar, USA, Russia, Ukraine, etc.

3.5 India: Vision for 2030

In order to meet the projected demand of 32 million tonnes of pulses by 2030, as per the Vision 2030 paper prepared by the Indian Institute of Pulses Research, Kanpur, a growth rate of 4.2% has to be ensured. As in the case of cereals, there is scope for a lot of enhancement in pulses productivity.

This will, however, require a paradigm shift in research, technology generation and dissemination, popularization of improved crop management practices, commercialization, Post Harvest Processing and Storage along with capacity building of the stakeholders in frontier areas of research. Genetic enhancement for yield and quality seed would be a critical factor in productivity.

Though India is the largest producer (around 25% of global production), it however, consumes 27% and imports around 14% of its pulses requirements. The yield of pulses in India is quite low at 781 kg/ha which might be due to policy neglect. ***The post green revolution era saw a sharp decline in per capita production and availability of pulses with record 4.0 million tones imports of pulses in 2012-13.*** Need is to diversify from cereal–based cropping systems to pulses-based cropping system with certain policy decision like identification of additional rice fallow lands largely in Eastern India, crop diversification, improving seed replacement rate, improved crop production techniques etc. Provisions should be made for easy credit, insurance, attractive Minimum Support Price (MSP) with procurement and appropriate incentives for pulse producers as well as creating necessary infrastructure for processing, marketing and value-addition.

Pulses, supplemented with cereals, provide a perfect mix of vegetarian protein of high biological value. The productivity of pulses in India is less than half of the productivity levels in the USA and Canada, as the pulses are mainly grown under rainfed condition in India in the areas with high rainfall variability. ***The persistent and growing demand–supply gap is putting pressure on prices and this good source of vegetarian protein is turning inaccessible to the poor.***

The production of pulses in India has caught in the vicious cycle of low and uncertain yields, poor per hectare returns resulting in farmers' least preference to grow pulses on irrigated and fertile parcel of land, thereby leading to unstable and low yields. **Inadequate adoption of Post Harvest production technology,** higher price volatility, production risk and low level of irrigation are the important influencing factors responsible for stagnation in the productivity of these crops.

The country would require 39 million tonnes of total pulses by 2050, which will require pulses production to grow at an annual rate of 2.2%. To fulfil the growing requirement, the country has to produce enough pulses as well as remain competitive to protect the domestic production.

It is imperative to develop and adopt more efficient crop-production technologies, Post Harvest Processing, Storage, along with favourable policies and market support to encourage farmers and processing industries. In order to provide the nutritional security to the poor masses relying on vegetarian diet, making pulses affordable through boosting domestic production of pulses is the best alternative.

In order to augment the supply of pulses to poor masses, under the current scenario supply through public distribution system will not only distribute pulses to poor at affordable prices and enhance nutritional security, but will also lead to stabilize prices and provide boost to the farmers through assured procurement.

The lack of advanced processing and waste minimization technologies adoption by the processing industries is one of the major issues in the poor performance of pulses market. Government interventions in the pre processing and post processing sector would provide adequate support in achieving sustainability of the pulses demand.

3.6 Pulses Production in Andhra Pradesh

Andhra Pradesh is one of the important pulse-growing states in India with an **area of 14 lakh hectares** with a **production of 4.0 lakh tones** annually. The important pulses grown in Andhra Pradesh are **Bengal gram**, **black gram**, **Red gram** and **Green gram**. The area in Andhra Pradesh represents 6 per cent of the total area in the country. The Andhra Pradesh state ranks seventh in area and eighth in production.

Area Under Cultivation and Productivity

Parameters	Rice	Wheat	Maize	Total Cereals	Gram	Total Pulses	Total Foodgrains	Total Oilseeds	Sugarcane	Cotton#
Area	3628	8	972	5041	681	1949	6990	1945	196	2400
Production	11510	10	4855	17039	762	1623	18662.5	1651.1	15567	7350
Productivity	3173	1250	4995	3380	1119	833	2670	849	79423	521

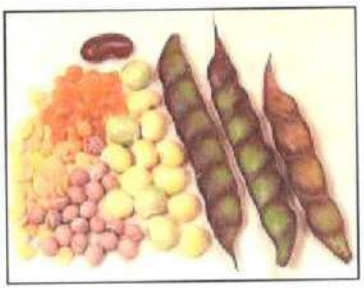
Area ('000 ha); Production ('000 tonnes); Productivity (kg/ha); # Production and Productivity in 1000 bales of 180 kg each

3.7 Pulses Production in East Godavari

The main occupation of the people in East Godavari District is Agriculture. Agriculture is the backbone of the Did's economy. The district has very good agricultural resources and is one of the most developed district in the State. East Godavari District is called the rice bowl of Andhra Pradesh. In the total geographical area of **10,81,842 hectares**, the net sown area in the did is estimated at **4,57,069 hectares**. The total net irrigated area in the District is estimated at 2,73,963 hectares; through canals 1,89,874 hectares; , Males 121020 49734 . 143413 7308 982996 Females 16572 726 40838 68774 1810849 Total 137602 50460 184251 76082 2793845 through web 29,060 hectares, through tanks 42,607 hectares; arid thrw other sources 12,422 hectares. Paddy is the main crop grown in the district. Paddy is grown over 9,76,660 acres of land, which constitutes 75 per cent d the food &ins crops grown in the district. Along with these, there are several other important crops grown in the district. For example jowar, bajra, **pulses like Black gram, green gram** and cash crops like sugarcane, chillies, cotton, oilseeds etc.

Production and Productivity of Major Crops-East Godavari

1.11	**Production and productivity of major crops** (Average of last 5 years 2004,05,06,07,08)	Kharif		Rabi		Summer		Total		
		Production (000't)	Productivity (kg/ha)	Production (000't)	Productivity (kg/ha)	Production (000't)	Productivity (kg/ha)	Production (000't)	Productivity (kg/ha)	Crop residue as fodder (000 tons)
Major Field Crops (Crops to be identified based on total acreage)										
1	Paddy	717	2983	796	4690	-	-	1513	3690	
2	Sugarcane	1488	88386	-	-	-	-	1488	88386	
3	Blackgram	-	-	-	-	8	267	8	267	
4	Greengram	-	-	-	-	12	276	12	276	
5	Cotton	18 ('000 bales of 170kg each)	398	-	-	-	-	18	398	



Chapter4

Health Benefits of Pulses in Diet

4.1 Introduction: "The wise man should consider that health is the greatest of human blessings. Let food be your medicine and medicine be your food."

Pulses (beans, peas, and lentils) have been consumed for at least 10,000 years and are among the most extensively used foods in the world. A wide variety of pulses can be grown globally, making them important both economically as well as nutritionally.

Pulses provide protein and fibre, as well as a significant source of vitamins and minerals, such as iron, zinc, folate, and magnesium, and consuming half a cup of beans or peas per day can enhance diet quality by increasing intakes of these nutrients. In addition, the phytochemicals, saponins, and tannins found in pulses possess antioxidant and anti-carcinogenic effects, indicating that pulses may have significant anti-cancer effects. Pulse consumption also improves serum lipid profiles and positively affects several other cardiovascular disease risk factors, such as blood pressure, platelet activity, and inflammation. Pulses are high in fibre and have a low glycemic index, making them particularly beneficial to people with diabetes by assisting in maintaining healthy blood glucose and insulin levels.

Emerging research examining the effect of pulse components on HIV and consumption patterns with ageing populations indicates that pulses may have further effects on health. In conclusion, including pulses in the diet is a healthy way to meet dietary recommendations and is associated with reduced risk of several chronic diseases.

Good for Your Heart

Including more pulses in your diet may lower your risk of cardiovascular disease, according to the Linus Pauling Institute. Pulses are high in fiber. For example, a 1 cup serving of cooked lentils contains more than 15 g of fiber, meeting 60 percent of your daily value. The fiber in the pulses may improve heart health by lowering cholesterol levels. Pulses also are high in potassium. Including more potassium-rich foods in your diet can lower blood pressure by counteracting the effects of sodium.

Lower Risk of Diabetes

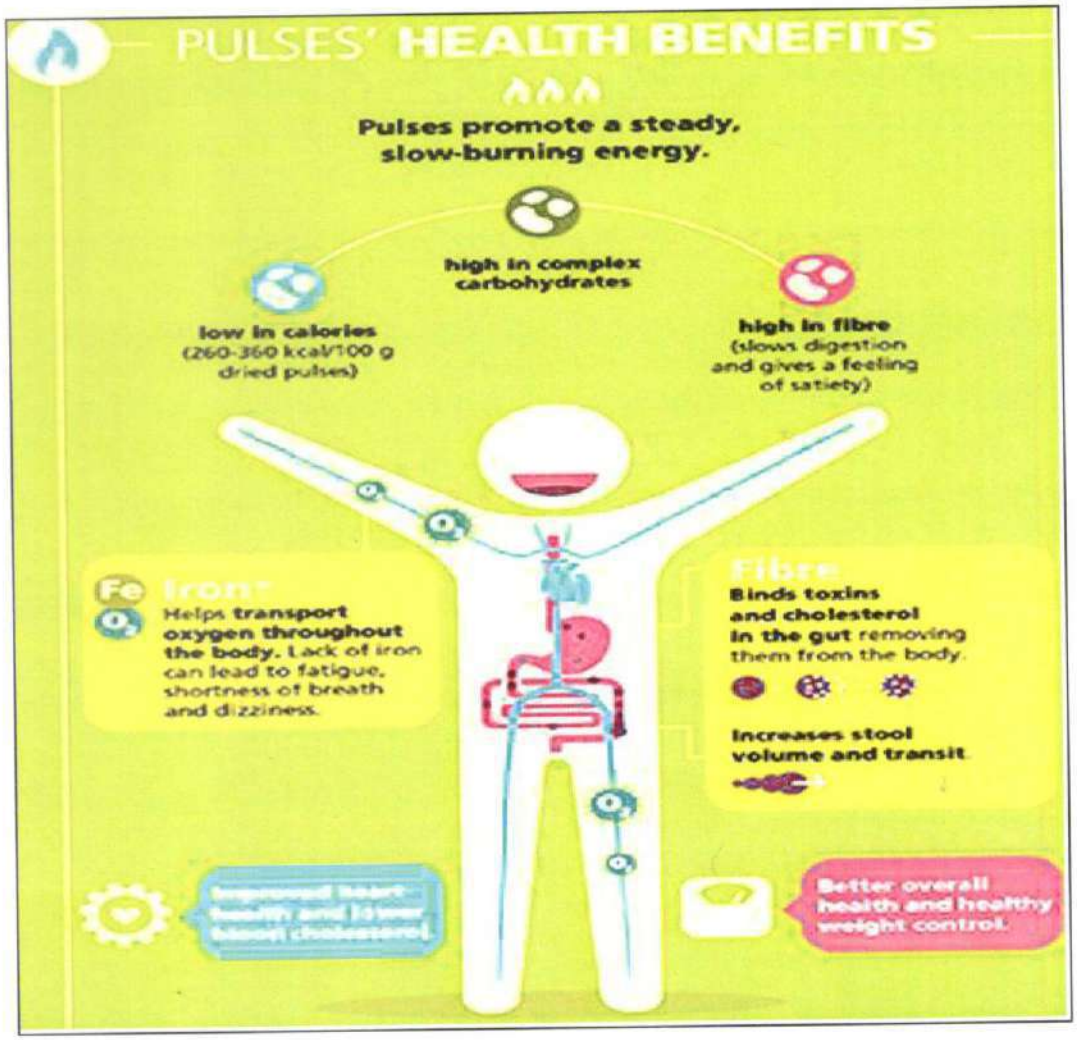
Pulses are a low-glycemic index food. The glycemic index ranks food on how it affects your blood sugar. Foods with a low glycemic index cause only a small rise in blood sugar, while foods with a high glycemic index cause a spike in blood sugar. People who include more low-glycemic foods in their diet have lower rates of diabetes. And if you already have diabetes, including pulses in your diet can make it easier for you to manage your blood sugar.

High in Protein

Pulses also make a healthy and inexpensive source of protein. Most pulses do not provide all of the essential amino acids, making them an incomplete source of protein. But if you include other grains and vegetables in your diet, you should be able to meet all of your amino acid needs. Soy beans, however, are one of only a few plant foods that provide all of the essential amino acids, making it a complete source of protein like meat. A 1 cup serving of cooked soybeans contains 26 g of protein, while a 3 oz. portion of cooked chicken contains 24 g of protein.

Good Source of Folate

Pulses also are a good source of folate, a B vitamin needed to produce and maintain new cells. Folate is especially important during periods of rapid growth, such as pregnancy and infancy. Women of childbearing age need adequate intake of folate to limit their risk of having a child born with a neural tube defect. Folate content varies among the different pulses. For example, a 1/2 cup serving of cooked black-eyed peas contains 105 mcg of folate, and the same size serving of cooked great northern beans contains 90 mcg.



Chapter5

Import & Export of Pulses

5.1 World Pulses Trade

Approximately 84 percent of the pulses produced in the world is to meet the domestic demand of the countries. The remaining portion of 16 percent is included in the world trade. According to the data of FAO about global pulses trade, Canada is a leading country in world pulses export with its export amount of 5 million tons. After Canada, Australia comes with 1,4 million tons, Myanmar with 1,3 million tons, USA with 1,1 million tons and China with 841 thousand tons. These countries are followed by Russia, France, India, Ethiopia, United Kingdom and Turkey.

India ranks first in pulses import. According to 2013 data, 28,4 percent, i.e. 3,8 million, of global pulses import was of India. China with1,1 million tons, Bangladesh with 816 thousand tons, Pakistan and Egypt with 433 thousand tons, United Arab Emirates with 391 thousand tons and Brazil with 373 thousand tons follow India.

India -- Pulse Supply-Demand Forecast
(hectares, metric tons)

Production	Season	2014-15	2015-16	2016-17	2017-18
Tur	Kharif	2,810,000	2,460,000	4,290,000	2,430,000
Gram	Rabi	7,330,000	7,170,000	9,040,000	8,590,000
Urad	Kharif	1,280,000	1,150,000	2,010,000	1,174,000
	Rabi	680,000	730,000	752,500	656,000
	Total	1,960,000	2,200,000	2,762,500	1,830,000
Moong	Kharif	870,000	1,030,000	1,460,000	929,000
	Rabi	640,000	560,000	712,500	531,000
	Total	1,510,000	1,600,000	2,172,500	1,460,000
Other	Kharif	770,000	710,000	940,000	756,000
	Rabi	2,770,000	2,800,000	3,145,500	2,724,000
	Total	3,540,000	3,510,000	4,085,500	3,480,000
All Pulses	Kharif	5,730,000	5,350,000	8,700,000	5,289,000
	Rabi	11,420,000	11,260,000	13,650,500	12,501,000
Total Production	Total	17,150,000	16,610,000	22,350,500	17,790,000
Pulse Imports	Peas	1,771,000	1,701,000	1,383,000	1,267,000
	Chickpeas	329,000	785,000	686,000	765,000
	Lentils	755,000	971,000	892,000	540,000
	Beans	1,054,000	1,145,000	1,071,000	1,056,000
Total Imports	All Pulses	3,909,000	4,602,000	4,032,000	3,628,000
Available Supply and Inferred Consumption (production plus imports)					
Total Supply	Pulses	21,059,000	21,212,000	26,382,500	21,418,000

Production estimates and forecasts based on historical data from India's agriculture department. Trade estimates based on data from exporting nations and the FAO

Regarding amounts, the most exported pulses product is dry pea. In 2013, the worldwide dry peas export was 4.6 million tons. The monetary value of this export amount is $ 2.1 million. Following dry peas, the most exported product is dry beans. While the export of dry beans is less than dry peas export regarding amount, its monetary value is higher. The amount of dry beans exported in 2013 was 4 million tons, while its monetary value was $ 3,8 million. Dry beans are followed by lentils with 2.6 million tons and chickpeas with 1.6 million tons. Lentil and chickpea are listed as 3rd and 4th in global export.

Americas reach the highest value regarding to export of dry beans, chickpeas, lentils and dry peas. In 2013, the dry peas export in the Americas was 3.3 million tons. This amount corresponds to 71.6 percent of world dry pea exports. Dry peas are immediately followed by lentil among the products exported by the American continent. In 2013, Americas have exported 2 million tons of lentils, 1 million tons of dry beans and 287 thousand tons of chickpeas.

Americas are followed by Asia in world exports of pulses. The dominant exported pulses products in Asian continent are dry beans. In 2013, 2,2 million tons of dry beans were exported in Asia, followed by 477 thousand tons of chickpeas, 286 thousand tons of lentils and 65 thousand tons of dry peas. In 2013, the third largest export region is Oceania. In Oceania, the main exported pulses are chickpeas (550 thousand tons). It is indicated that, the export of chickpeas is followed by lentils (316 thousand tons), dry peas (189 thousand tons) and dry beans (63 thousand tons).

The fourth largest export region is Europe. In 2013, 873 thousand tons of dry peas were exported in Europe. Dry peas are followed by chickpeas with 200 thousand tons, dry beans with 124 thousand tons and lentils with 35 thousand tons. In the African continent, a total of 851 thousand tons of pulses were exported in 2013. The main exported pulses are dry beans, dry peas, chickpeas and lentils respectively.

Asian continent is the first in importing pulses. Accordingly, the Asian continent has imported 3.2 million tons of dry peas, 1.5 million tons of dry beans and 1.7 million tons of lentils in 2013. Asian continent is followed by Europe. In 2013, 613 thousand tons of dry peas were imported by the European continent. In Americas, the most imported product is dry beans. In 2013, 937 thousand tons of dry beans were imported in the continent. Dry beans are the most imported products in Africa and Oceania. In 2013, the dry bean import in Africa was 351 thousand tons, whereas it was 15 thousand tons in Oceania.

Chapter6
Quality Standards and Testing of Pulses

6.1 BIS, FSSAI and CODEX Standards and Analytical tests:

- Identify the quality characteristics of pulses
- Determine end use of the pulses

List of tests

Colour

Colour of dehulled lentils is measured using a Hunterlab LabScan XE spectrocolorimeter using the CIE (1976) L*, a* and b* colour scale with a D65 Illuminant.

L*=darkness (0) to brightness (+);
a*=greenness (-) to redness (+);
b*=blueness (-) to yellowness (+).

Cooking time

Cooking time is determined using an automated Mattson cooker as described by Wang and Daun (2005), Journal of the Science of Food and Agriculture 85:1631-1635. The automated Mattson cooker consists of a cooking rack and 25 hollow plungers. The weight of each plunger is adjusted to 90 g. A sample (30 g) is soaked in distilled water at room temperature (22±2°C) for 24 h. Soaked seeds are then positioned into each of the 25 saddles of the rack so that the tip of each plunger rests on the surface of the seed. The rack is then placed into a 2 L metal beaker containing 1.2 L of boiling water. When a seed becomes sufficiently tender, the plunger penetrates the seed and drops a short distance through the hole in the saddle. The time taken for each plunger to drop is automatically recorded. Cooking time for a sample is defined as the time required for 80% of the seeds to be penetrated.

Dehulling characteristics of red lentils

Dehulling characteristics of Pulses are determined using a Satake TM05C Grain Testing Mill (Satake Engineering Co Ltd, Hiroshima, Japan) in accordance to the procedure described by Wang (2005), Cereal Chemistry

82(6):671-676. Lentil/pulses seeds are passed through a series of sieves with 4.5, 5.0 and 5.5 mm holes and separated into fractions.

The fraction ranging from 4.5 to 5.0 mm is used. Samples (30 g) are tempered to 12.5% moisture before they are dehulled. The tempered lentils are then processed in the mill for 38 sec. The speed of rotation of the abrasive wheel is operated at 1100 rpm. After dehulling, the powder is collected using a No. 20 mesh sieve and the rest of the product is separated into whole seeds, split seeds, broken seeds and hulls using a dockage tester (Simon-Day Ltd., Winnipeg, Canada).

Both split and whole seeds are further separated by hand into their respective hulled and dehulled classes. All fractions are weighed and expressed as a proportion of the total original weight. Dehulling efficiency (%) is calculated as the sum of dehulled whole seed (%) and dehulled split seed (%).

Firmness of cooked pulse seeds

Firmness of cooked seeds is measured with a TA-HDi texture analyzer (Texture Technologies Corp., Scarsdale, NY) according to the method described by Wang et al (2010), Food Chemistry 118:109–115. A TA-91M Kramer Shear Cell (Texture Technologies Corp., Scarsdale, NY) is used. Firmness of cooked seeds is defined as the maximum force required to shear the cooked seeds and expressed as the maximum shear force per gram of cooked sample (N/g cooked sample). Values reported are averages of six determinations.

Seed weight

100-seed weight is determined according to the AACC method 56-35.01. Broken and damaged seeds along with foreign material were handpicked from a sample. One hundred seeds are counted using a custom-made seed sampling paddle and weighed.

Protein Content

Protein content (N x 6.25) is predicted by near-infrared (NIR) spectroscopy using a NIRSystems 6500 scanning near-infrared spectrometer. The instrument is calibrated and results are verified by the AOAC Official Method 992.23 – Crude Protein in Cereal Grains and Oilseeds Generic Combustion Method using a LECO Model FP-428 CNA analyzer. Protein content is reported as percentage calculated on a dry matter basis.

Starch content

Starch content is determined by the AACC method 76-13.

Water absorption

Water absorption or hydration capacity defined as the maximum amount of water that 100 seeds absorb at room temperature (22±2°C) is determined by the AACC method 56-35.01.

TESTING Standards as per FAO (Food and Agriculture Organisation of the United Nations)

6.2 Codex Standard For Pulses

The Codex Alimentarius is a collection of internationally recognized standards, codes of practice, guidelines, and other recommendations relating to foods, food production, and food safety. Its name is derived from the Codex Alimentarius Austriacus.

1. Scope

This Standard applies to the whole, shelled or split pulses defined below which are intended for direct human consumption.

2. Description

Pulses are dry seeds of leguminous plants which are distinguished from leguminous oil seeds by their low fat content.

6.3. Essential Composition And Quality Factors

6.3.1 Quality factors – general

1 Pulses shall be safe and suitable for human consumption.
2 Pulses shall be free from abnormal flavour, odours, and living insects.
3 Pulses shall be free from filth (impurities of animal origin, including dead insects) in amounts which may represent a hazard to human health.

6.3.2 Quality factors – specific

1. Moisture content
2.Two maximum moisture levels are provided to meet different climatic conditions and marketing practices.

6.3.3 Pulse Moisture content (percent)

Beans 15, lentils 15, peas 15, chick peas 14, cow peas 15, and field beans 15 percent is desirable. Lower moisture limits should be required for certain destinations in relation to the climate, duration of transport and storage. Governments accepting the Standard are requested to indicate and justify the requirements in force in their country.

In the case of pulses sold without their seed coat, the maximum moisture content shall be 2 per cent (absolute) lower in each case.

6.3.4 Extraneous matter is mineral or organic matter (dust, twigs, seed coats, seeds of other species, dead insects, fragments, or remains of insects, other impurities of animal origin). Pulses shall have not more than 1% extraneous matter of which not more than 0.25% shall be mineral matter and not more than 0.10% shall be dead insects, fragments or remains of insects, and/or other impurities of animal origin.

6.3.5 Toxic or noxious seeds

The products covered by the provisions of this standard shall be free from the following toxic or noxious seeds in amounts which may represent a hazard to human health.

6.3.6 Contaminants

1. Heavy metals
Pulses shall be free from heavy metals in amounts which may represent a hazard to health.

2 Pesticide residues

Pulses shall comply with those maximum residue limits established by the Codex Alimentarius Commission for this commodity.

3 Mycotoxins

Pulses shall comply with those maximum mycotoxin limits established by the Codex Alimentarius Commission for this commodity.

6.3.7 Hygiene

1. It is recommended that the products covered by the provisions of this standard be prepared and handled in accordance with the appropriate sections of the Recommended International Code of Practice – General Principles of Food Hygiene (CAC/RCP 1-1969), and other Codes of Practice recommended by the Codex Alimentarius Commission which are relevant to these products.

2. To the extent possible in good manufacturing practice, the products shall be free from objectionable matter.

3. When tested by appropriate methods of sampling and examination, the products:– shall be free from micro-organisms in amounts which may represent a hazard to health;
– shall be free from parasites which may represent a hazard to health; and
– shall not contain any substance originating from micro-organisms in amounts
which may represent a hazard to health.

6.3.8. Packaging

1. Pulses shall be packaged in containers which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product.

2. The containers, including packaging material, shall be made of substances which are safe and suitable for their intended use. They should not impart any toxic substance or undesirable odour or flavour to the product.

3. When the product is packaged in sacks, these must be clean, sturdy and strongly sewn or sealed.

6.3.9. Labelling

In addition to the requirements of the Codex General Standard for the Labelling of Prepackaged Foods (CODEX STAN 1-1985), the following specific provisions apply:

1. Name of the product
The name of the product to be shown on the label shall be the commercial type of the pulse.

2. Labelling of non-retail containers

Information for non-retail containers shall either be given on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packer shall appear on the container. However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying

Chapter 7
Diagnostic Study of the Cluster

7.1 Introduction

Pulses are a wonderful gift of nature. They provide nutrition to human beings and animals. Pulse cultivation improves soil health by fixing nitrogen. Their importance as a source of protein for masses in India is well recognized and therefore, their production and availability· assume special significance for the nutritional security of the people. However, pulse production in the country is stagnating due to long standing problems. This ***disturbs nutritional balance of the population especially of poor and weaker sections*** who cannot afford expensive animal proteins.

Pulses production has been stagnated between 11 to 15 million tonnes in the last decade, while the requirement pulses are estimated to increase to about 22 million tonnes by 2019. As a result of shortfall in production, India has become regular importer of pulses in recent years.

There were large differences in both consumption and production of pulse crops to meet the growing domestic demand and to reduce imports and exploit export opportunities. ***There should be greater emphasis on the adoption of improved Pulses Cultivation, Post Harvest, Pulses Production Milling, Storage and package of practices.*** With the adoption of improved pulse production technology it is estimated that the post harvest wastage can be eliminated and has a potential to increase productivity by about 30 per cent.

The Sri Mahalakshmi Pulses Mills Cluster is a micro industrial cluster with small pulses processing units; these units are majorly equipped with mini dal mills of capacity of about 100kg per hour and are capable of De-husking and hulling of whole pulses.

7.2 Cluster location & size

The Cluster is located in Rayavaram Village, Machavaram, Rayavaram Mandal of East Godavari District, Andhra Pradesh. More than 70% of the units are within the radius of 5 km, and remaining 30% uints are spread in a radius of 10 km from the proposed location of the CFC.

7.3 Employment Created at the Cluster

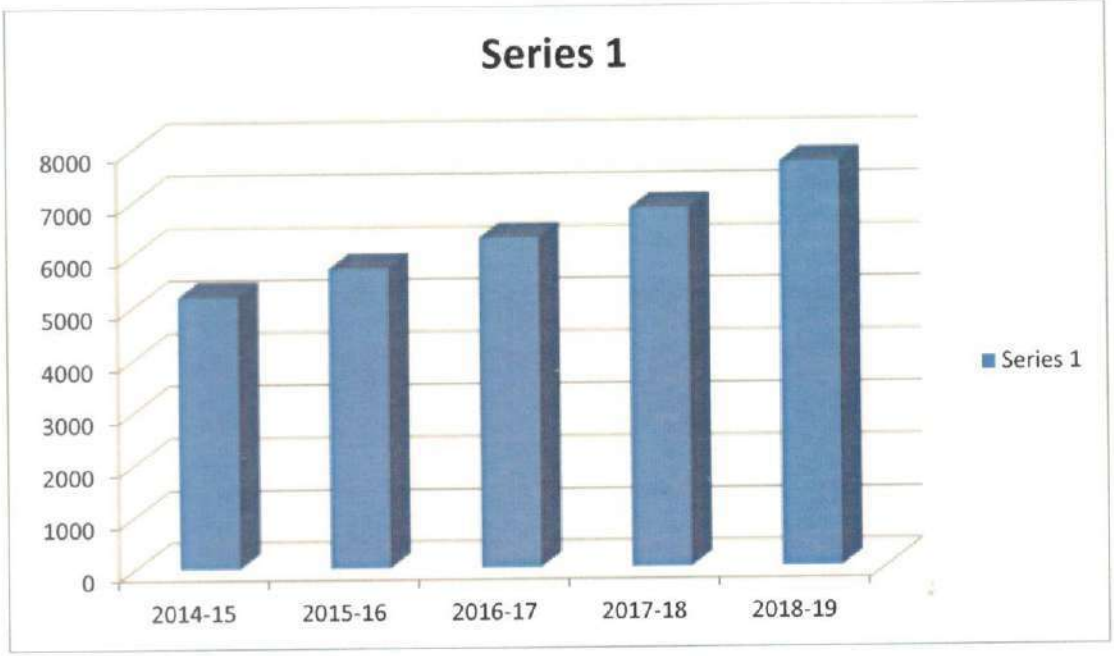
The direct employment created by the cluster is about 565 jobs and about 1500 jobs indirectly.

Sl. No.	Category	Direct Employment	Indirect Employment	Percentage
1	Men	476	**1200**	80%
2	Women	119	**300**	20%
	Total	**595**	**1500**	

The cluster is a good source of rural employment and provides employment to all categories of people. It is found that about 20% f the employment goes to the weaker section of the society like SC/ST and other Minorities.

7.4 Turn Over of the Cluster:

year	2014-15	2015-16	2016-17	2017-18	2018-19
Turnover (Rs. Lakhs)	5191	5720	6292	6840	7700



The Turnover of the cluster is found to be progressive but the percentage of progress is comparatively low and can be improved if the proposed CFC is established which will help the cluster members to conquers new markets.

7.5 Technical Knowledge of the Cluster Members

The Cluster members are skilled in pulses processing from their age old experience. The Govt. institutions such as the District Industries Centre, and MSME are instrumental in upgrading the skills and bringing about technological awareness in the cluster members.

7.6 Technology Availability at Cluster

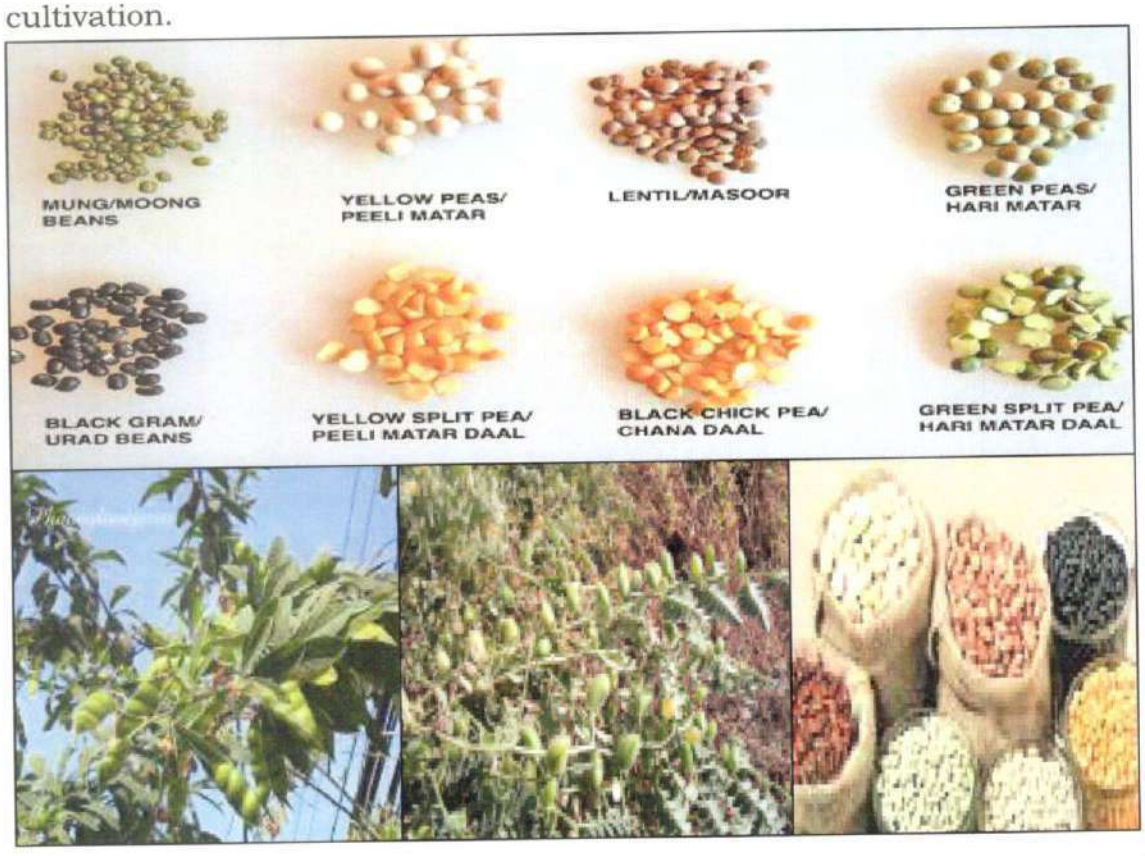
At present the cluster members are using traditional methods and semi-automatic dal mills of processing capacity ranging from 100kg to 200kg per hour and are micro in nature. Lot of advancement has taken place in the processing technology; however the cluster members are economically weak and are dependent on mechanical processing equipments.

7.7 Raw Material Availability

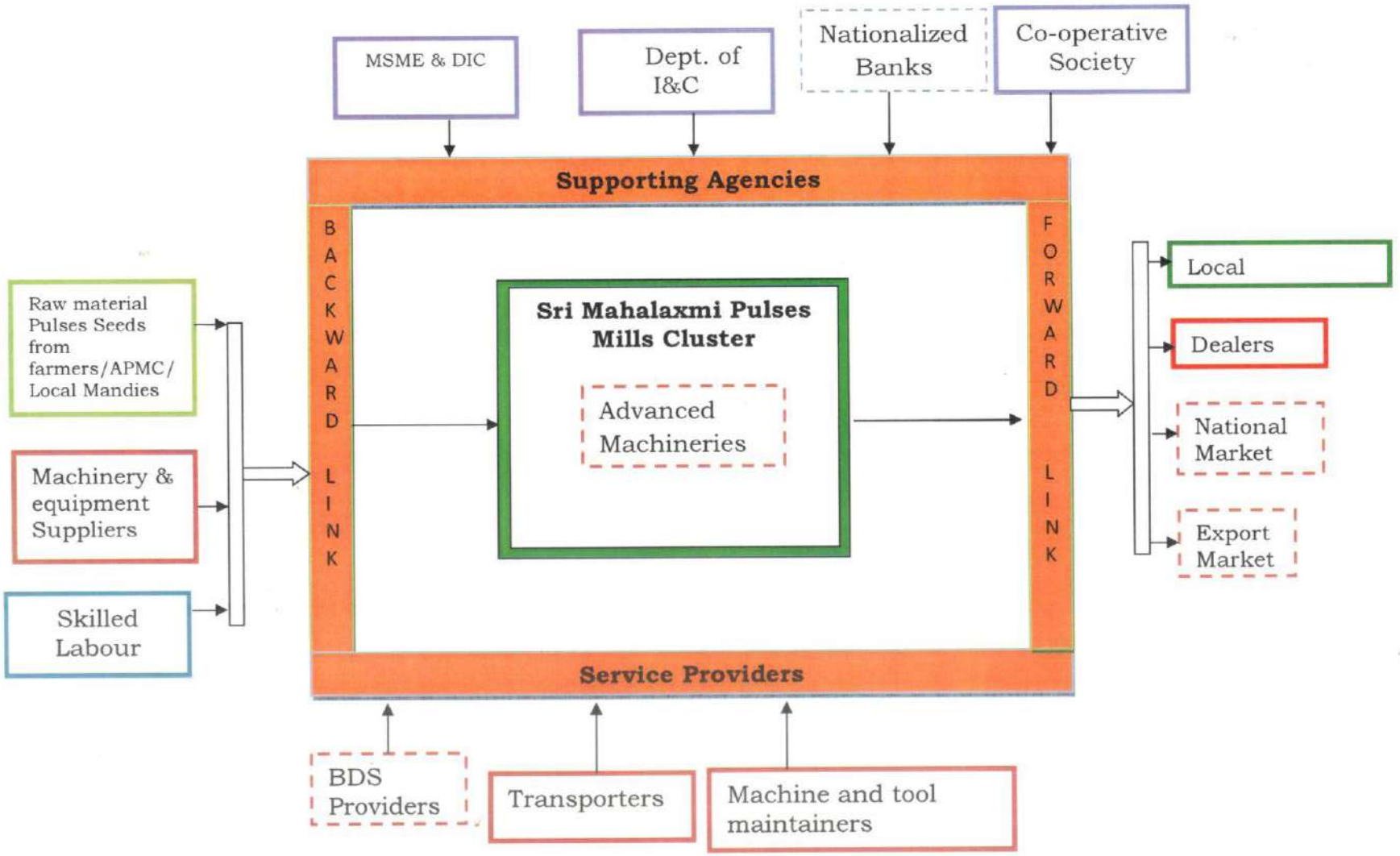
Andhra Pradesh is one of the important pulse-growing states in India with an area of 19.49 lakh hectares with a production of 14.23 lakh tones annually. The important pulses grown in Andhra Pradesh are Bengal gram, black gram, Red gram and Green gram. The area in Andhra Pradesh represents 6 per cent of the total area in the country. The Andhra Pradesh state ranks seventh in area and eighth in production.

7.8 Varieties of Pulses Grown in Cluster Region

The cluster region framers are involved in cultivation of different types of pulses like tur, chana, moong, urid and masur. However toor dal is the major corp covering 70% of the cultivation and chana accounts to 10% of the cultivation, moong dal accounts to 14% of the pulses cultivation and other varieties like urid and masur accounts for 6% of the pulses cultivation.

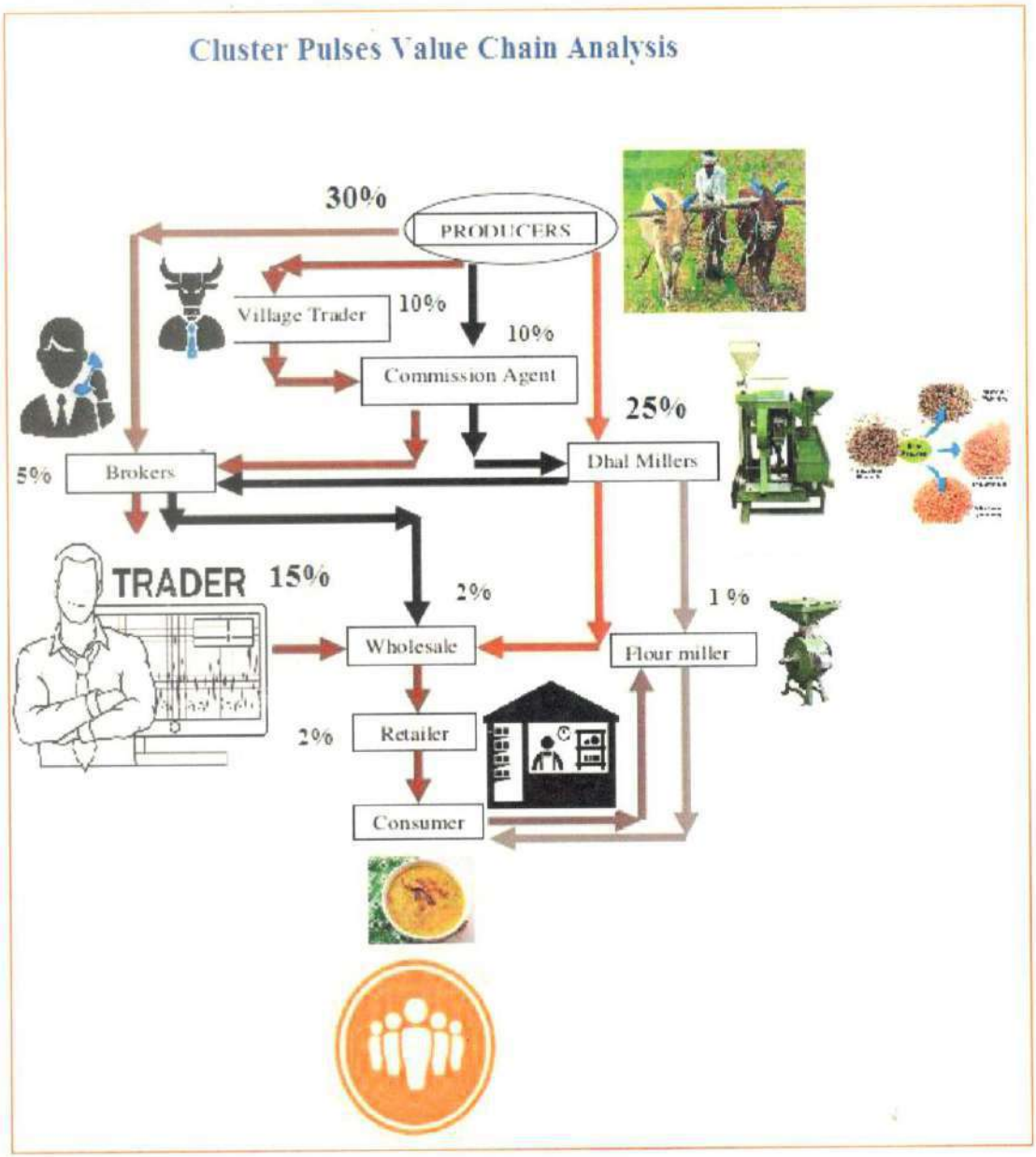


7.9 Cluster Map



The figure represents the cluster map of the proposed cluster. The dotted lines indicate the weaker links and the thick lines indicate the strong links. The cluster has got coordination with the backward linkage section particularly the farmers and there is sufficient raw material availability in the cluster. The weaker links are the areas like research support, financial support, and exposure to national and international market.

7.10 Value Chain Analysis



From the value chain analysis of the cluster products it is evident that the present scenario is dominated by the traders middlemen who are the biggest gainer and the farmers are the poor gainers. The consumer is paying the cost of lack of proper marketing and supply chain mechanism.

The Interventions like CFC with bulk direct raw material procurement and direct marketing infrastructure will reduce the burden on the consumer and will largely benefits the farmers. The processing facilities will help to bring down the processing cost from current 25% to about 15% this will largely benefits the processor and the backward and forward linkage elements.

Chapter8

Current Production Practices and Drawbacks

8.1 Introduction

Pulses are mainly consumed in the form of dehusked split pulses, as these are rich in proteins. In vegetarian diet pulses are main source of protein. There are about 4000 pulses mills (Dal mills) in India with varying capacity of pulse mills ranging from 100Kg to 12 tonnes per day.

The cluster industries at present are using age old technology for processing the pulses. The plant and machineries are made of old technology based on mechanical and manual control. Due to this the output quality of the processed dal is having lot of variations and quality degradation is taking place. There is wastage of about 30% due to improper processing machineries. As a result the industries are facing economic problems. There is a stiff competition from large scale industries.

8.2 Present Processing Methodology

Pulse milling

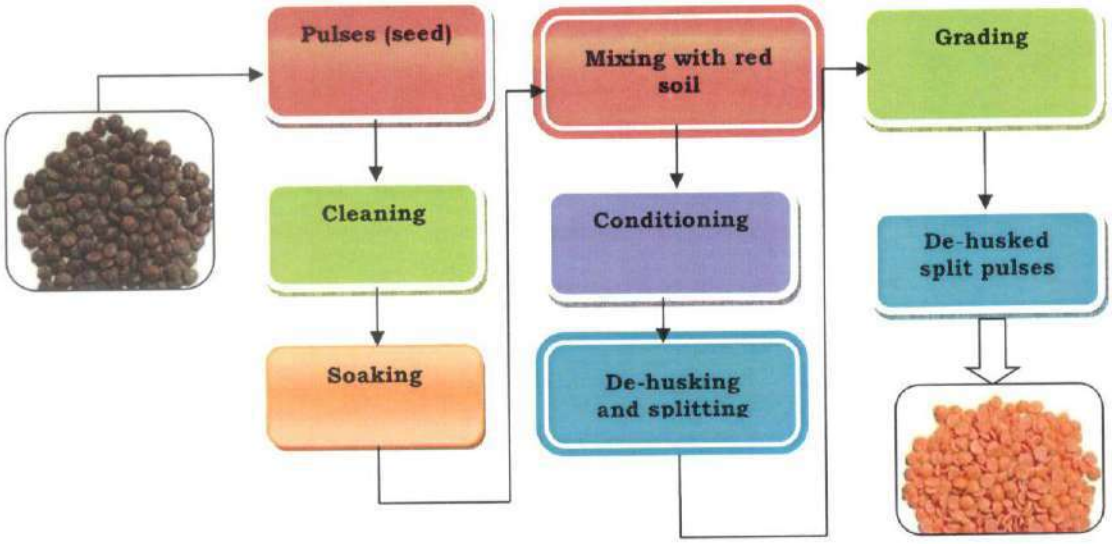
Pulses are usually converted into Dal by decutilating and splitting. Both dry and wet milling processes are employed. By and large carborundum emery rollers are used for dehusking and burr grinders for splitting. Decuticling is seldom complete in single pass requiring multiple passes, each pass producing 1.5 to 2% fines reducing recovery of dal.

Basic processes in dal milling are cleaning, dehusking, splitting, separation, Grading, Polishing and bagging. Major variation is involved with dehusking process only. Dals like Arahar, urad, moong and lentil are difficult to dehusk as a result repeated operations by dehusking rollers are required. Rewetting and drying is done to loosen portions of husk sticking after repeated rolling. Linseed oil is used to impart shine or better appeal to the milled dal. The removal of the outer husk and splitting the grain into two equal halves is known as milling of pulses. To facilitate dehusking and splitting of pulses alternate wetting and drying method is used. In India trading milling methods produce dehusked split pulses.

Loosening of husk by conditioning is insufficient in traditional methods. To obtain complete dehusking of the grains a large number of abrasive force is applied in this case as a result high losses occur in the form of brokens and powder. Yield of split & pulses in traditional mills are only 65 to 75% due to the above losses compared to 82 to 85% potential yield.

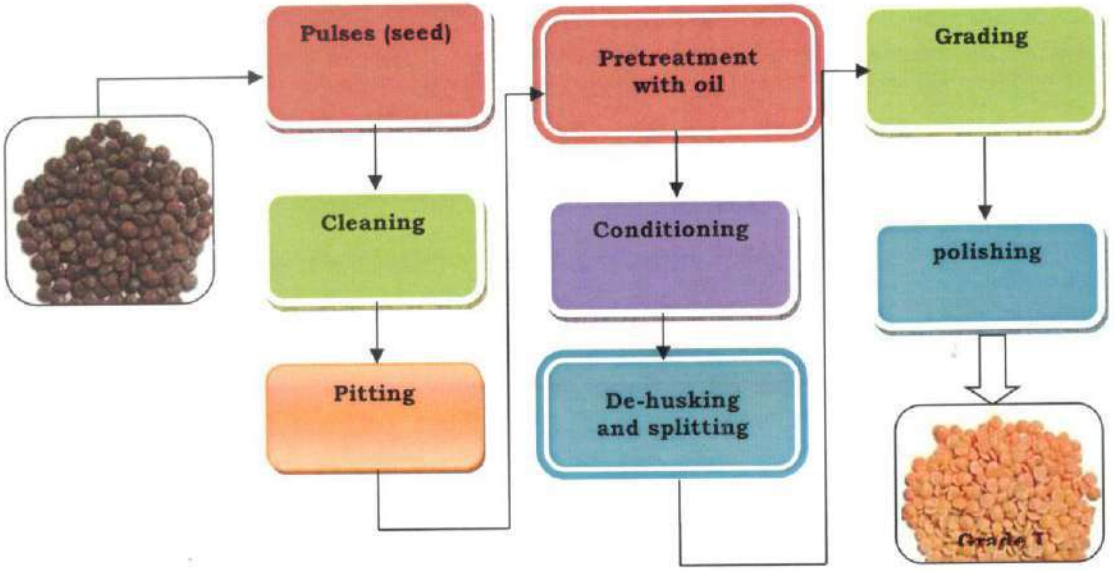
Procedure for pulse milling

There are two types of conventional pulse milling methods. Wet milling and dry milling method. Flow diagram of wet milling is given below:



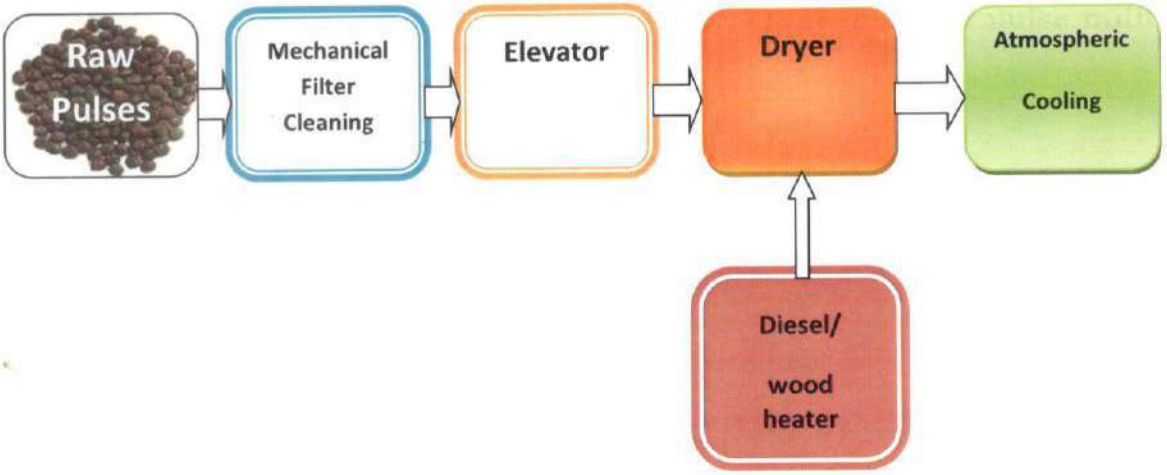
Dry milling of Pulses

For all types of pulses there is no common processing method. However, some general operations of dry milling method such as cleaning and grading, rolling or splitting, and moistening, drying and milling are considered.



8.3 The detailed processing methods employed by the cluster members and their drawbacks

Stage1



- The raw pulses are filtered through mesh
- **nearly 2-3 hours**

- The wet material is dried in this stage
- Moisture is removed
- Heat is applied using diesel hot air blowers or using wood/charcoal burning
- Nearly 40 ^{0}c temperature is maintained

Draw back- no monitoring and sensing control system is available due to this sometimes the pulses get over heated/Over Cooked and

The heated Cooked pulses are then cooled in atmosphere for **12 hours**

Drawback-long duration

Advanced technology can be used for Automatic Drying and cooling and the time can be considerably reduced

Total time take (stage1) =16 hours

Quality parameter=No advance Temperature monitoring & control system used, due to this sometimes the pulses get over heated and burned.

Cleaning

Cleaning of pulses from dust, chaff, dirt, grits, etc. and grading according to size is performed by a reel type or rotating screen type cleaner.

The dry husk, inert material, and small shriveled seeds are discarded by using sieves [A **sieve**, or **sifter**, separates wanted elements from unwanted material using a woven screen such as a mesh or net]. This process is usually accomplished by the cluster people by employing manual labor or by using out dated machineries which are either manually driven or motorized. The process takes longer time to be completed because of the capacity of the machines which can only support a few hundred kgs and can't handle heavy loads (in ton).hence causing a delay at the end product and marketing.

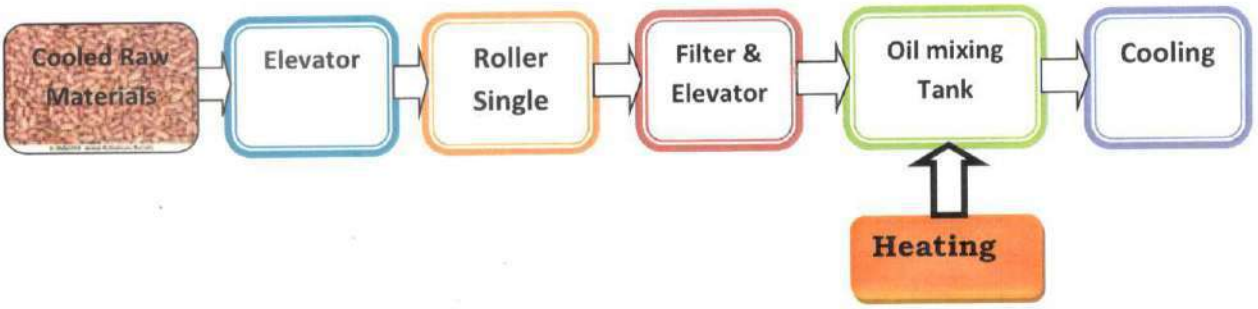
Milling

A dal or pulse mill with processing capacity of 200 kg/hour TO 500kg/hour is installed in most of the cluster units, which is an average processing capacity and it would mean a daily capacity with 1 shift working of 1 ton to 1.5 tons.

Pitting

An emery roller machine is used to obtain cracking and scratching of clean pulses passing through it. For loosening the husk to facilitate the subsequent oil penetration this is required. Gradually the clearance between the emery roller and cage (housing) is narrowed from inlet to outlet. Cracking and scratching of husk takes place mainly by friction between pulses and emery as the material is passed through the narrowing clearance. During the operation some of the pulses are de-husked and split which are separated by sieving.

Stage 2



Roller

- Partial Skin is removed in each trial
- Nearly 3 trials are needed

Filter

5-10% of the Skimmed pulses are separated

Oil Mixing

Oil is mixed for preparing the pulses to remove skin easily

Cooling Tank

Oil mixed pulses are cooled in tank for 12 Hours

Pre-treatment with Oil:

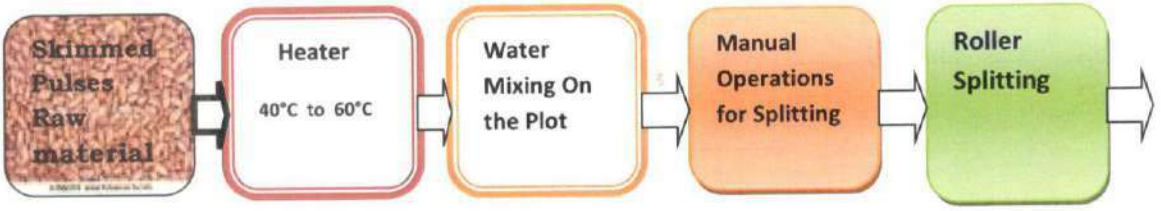
A screw conveyor allows passing the scratched or pitted material through it and mixing of some edible oil like linseed oil is completed. The linseed oil is used at the rate of 1.5 to 2.5 kg/tonne of pulses. These are kept on floors for about 12 hours to diffuse the oil.

Conditioning

Pulses are conditioned by alternate wetting and drying. Moisture (3.5%) is added to the pulses after sun drying for a certain period and tempering is done for about eight hours.

The grain is dried in the sun again. By allowing water to drop from an overhead tank on the pulses which are passed through the screw conveyor addition of moisture to the pulses are achieved. Until all pulses are sufficiently conditioned the whole process of alternate wetting and drying is continued for two to four days. Pulses are finally dried to about 10 to 12% moisture content.

Stage 3



Heater

- Time taken=3Hours.

Water Mixer

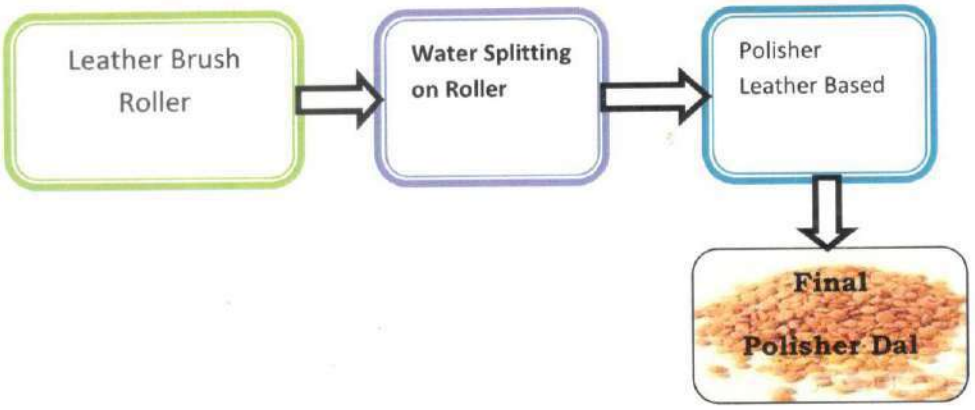
Water is sprayed on the hot pulses.

De-husking and Splitting:

For dehusking of conditioned pulses emery rollers called as Gota machine are used. In one pass or single operation about 50% of pulses are dehusked. Dehusked pulses are split into two parts. Dehusked split pulses are separated by sieving and the husk is aspirated off. Unsplit dehusked pulses and tail pulses are again dehusked and milled in a similar way. Till the running pulses are dehusked and split of the whole process is repeated two or three times.

100 per cent-dehusking and splitting of pulses are seldom achieved particularly in cases of certain pulses like Red gram, black gram and green gram. Of them Red gram is the most difficult pulses to dehusk and split. Only about 40 to 50 per cent Red gram grains are dehusked and split in the first pass of preconditioning and milling. Emery rollers, known as Gota machine are used for the dehusking of conditioned pulses About 50 per cent pulses are dehusked in a single operation (in one pass). Dehusked pulses are split into two parts also, the husk is aspirated off and dehusked, split pulses are separated by sieving. The tail pulses and unsplit dehusked pulses are again conditioned and milled as above The whole process is repeated two to three times until the remaining- pulses are dehusked and split.again this process is done by manual labour or poorly mechanized vibrator or roller machines. Hence this process takes a lot of valuable time since the cluster doesn't have upgraded machineries which can handle tons of input.

Stage 4



Polishing:

Polishing is completely by treating de-husked and split pulses with a small quantity of oil and/or water. The pulses are passed through different rollers to give fine polish shine. The Cluster needed advance polishing machine.

8.4 Cluster Market

The statistics indicated by the government of India about the import and export of pulses clearly specifies that there is a huge gap between supply and demand. India is 25% producer of the pulses when compared with the total world production but still every year India need to import pulses from other countries to support its more than 60% of the population.

Hence there is a huge market available to the cluster units but it has to be properly mobilized. The daily per capita availability of Pulses is less than 10 gms and declining with growing population. The marketable surplus in Pulses is 60-70% in major producing states and purchased by millers for processing. Presence of large middlemen adds value to the produce from production phase to consumption. The cluster supplies its processed pulses to local, district, state and national market through different distributers and middlemen.

8.5 Cluster Marketing Methodology

The cluster currently does not have proper market facility, and is majorly dependent on general market department of government or on local and state distributers and middlemen. As a result pricing of raw material and furnished products is increased and the middlemen are benefited. The cluster need to have a dedicated raw material purchase and distribution system, at the same time if a common furnished product sale point is created the pricing can be controlled. The cluster need to maintain transparency in its system of marketing and distribution, this can be achieved by establishing a common system integrated with advance technology like software based solution. This web based solution will help to keep a watch on the middlemen and will help the proper control on pricing of the pulses.

The following are main marketing constraints:

1. Distress sale :

Due to financial crisis, farmers are forced to sell their produce just after harvesting. During this period, farmers get lower price due to glut in the market. The producers cannot withhold or store their produce for some period to get better price.

Unstable price:

Generally, the price of pulses prevails low in the early post harvest period due to more arrivals of harvested raw materials in the market and later on prices go up. Due to this unstable price, the farmers get lesser price and the processing industries also face consequences of these.

2. Lack of marketing information:

Due to lack of information regarding arrivals and prices prevailing in other markets, producers market the pulses in the village and nearby market at lower price, which can be avoided.

3. Adoption of standards:

Farmers usually do not grade their produce (pulses-seeds), as a result they do not get remunerative price in the market. The furnished product is also not graded due to lack of technology for grading as a result the better quality processed pulses is also sold out at lower prices.

The cluster lack grading machineries and hence it is strongly recommended that a separate grading centre must be set up at the cluster level. This grading centre could be utilized by both farmers and cluster industries.

4. Infrastructure facilities:

Due to inadequate infrastructure facilities with producers, traders and at market level, the marketing of Pulses is affected adversely. The cluster does not have dedicated storage facilities to store the raw material and the furnished/processed products. Presently the cluster members are utilizing the common storage rooms built by the Govt. due to this the pulses are susceptible to attack of licks, ticks and other rodent which grow in other crops.

5. Malpractices in markets:

There are many malpractices prevailing in markets like excess delay in payment, high commission charges.

6. Superfluous middlemen:

The existence of a long chain of middlemen reduces the share of the consumer's price received by the producer-seller.

7. Traditional varieties are unsuited to some export markets

Production continues to be dominated by traditional varieties, which tend to be smaller than those preferred in developed countries. Also there are no sorting machineries and grading machineries available at the cluster hence quality products are not graded and packed separately for export.

8. Marketed quality is unnecessarily low

Marketed quality is low due to insect damage but also as a consequence of high proportions of foreign matter. The latter is partly due to poor post-process practices.

However, it also stems from the informal nature of trading and the lack of use of grades and standards. Pulses are traded in gunny bags from the farmer through to the point of retail sale. Farmers see it as in their interest to ensure that each bag contains the maximum amount of foreign matter acceptable to the buyer, thereby maximizing the marketed weight. This adversely affects the bulk of domestic consumers, who typically buy pulses that have not been cleaned and which contain the same amount of foreign matter as that sold by the farmer. These consumers pay for the transport of unwanted foreign matter, are uncertain as to the extent to which their purchase contains foreign matter, and must devote labor to cleaning their purchase before they can use it.

In the case of pulses destined for export, unnecessary transport cost are incurred prior to cleaning, there are large weight losses during cleaning, and the process of cleaning is made more difficult and costly. Thus, costs are raised significantly. While it is rational for individual farmers to include the maximum amount of foreign matter that they can get away with, the net collective impact of this action is to raise unit processing and marketing costs and reduce the prices that farmers receive.

High levels of foreign matter pose a particular problem for pulses bought by primary cooperatives, since they pay a single price for farmers' deliveries regardless of quality, with their only control on quality being the rejection of deliveries with very obvious high levels of foreign matter. This means that farmers who have abnormally clean consignments for sale invariably choose to sell them to (the minority of) private traders seeking to assemble consignments of high quality.

9. Marketing is generally competitive but inefficient

The cluster products have market and demand worldwide. Since the pulses are basic ingredients of our daily diet. The demand and supply gap of India also reveals that there is a huge requirement of pulses in the country but due to lack of single transparent marketing mechanism at cluster level. The cluster members are in efficient in utilizing the potential of the market.

Assembly marketing systems involve large numbers of mostly small-scale traders, between whom competition is intense. Systems are structurally complex. At one extreme, farmers may sit in a local market and sell their produce to consumers, in effect acting as a retailer. At the other extreme, traders in rural market towns may buy directly from farmers, may use a buying agent to procure from farmers, or may purchase from other traders. The produce may then change ownership several more times before being retailed in urban centers.

Secondary trading is also competitive, with traders frequently making use of specialized market brokers. Most domestic secondary trading is through well-established contacts, with deals being done by telephone on the basis of trust, often with the participation of specialized brokers. Written contracts are rare. Most traders use hired transport that is reportedly readily available other than at times of very high demand. There is adequate cleaning capacity, allowing secondary traders to rapidly meet the requirements of exporters and of large-scale traders assembling consignments for donors.

10. Despite the generally high level of competition, the system for trading pulses is inefficient.

Marketing chains tend to be long with high trading costs at each point of exchange. The lack of formalized marketing means that identifying, negotiating and concluding deals involve high transactions. Poor cultivation methods and a lack of onfarm/cluster level sorting means that individual consignments are inconsistent in terms of the size and color of the grain and of grain quality.

8.6 Quality control and quality assurance practices

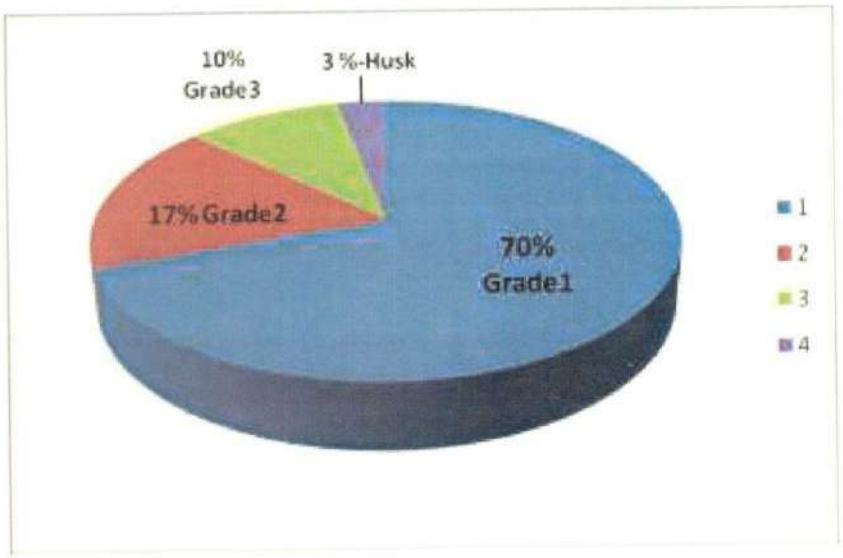
1. Production quality:

The cluster is currently adopting age old technologies at the production level as a result there is a huge variation in quality of output. There are three quality of pulses produced:

Grade1: 70% of the total raw material used for processing is converted in grade1 quality pulses.

Grade2: 17% of the total raw material used for processing is converted in to grade2 pulses.

Grade3: 10% of the total raw material used for processing becomes the grade3 product.



The variation in the quality of output is due to many reasons like

Ungraded raw material: the processing industries do not have grading machineries for separation of low quality of raw material from good quality material. As a result of the mixed quality of raw material the quality of output is falling.

Poor processing technology: the cluster members are using convectional age old machineries designed by local suppliers, the machines are mechanically operated machineries with no or very little automatic control system involved, as a result the operations are not smooth.

Lack of sorting and grading machineries for product: the cluster lack grading and sorting machineries required, to clearly distinguish quality of product and separate it, as a result the mixed or poor graded product finds poor market response and revenue for the enterprises.

2. Storage

The cluster lack dedicated storage system. The processed pulses are stored either in simple sheds in the industry, or stored in warehouses maintained by government and some private operators. All these warehouses are general purpose storage facilities that are used for storing all types of food grains and related products, it is a fact that some of the food grains undergo infestation very fast and this may lead to spread of these insects and rodents in the area where pulses are stored thereby resulting of complete spoiling of the pulses also.

Pulses suffer heavy losses due to stored grain pests. The quality of seeds stored in the traditional storage structures also deteriorates. Further, there are no small processing units to convert pulse grains into Dal and other byproducts. This compels the growers to dispose of their produce immediately after harvest at low price.

The success of green revolution has enabled India to produce over 160 million tones of food grains every year. ***Conservative estimates put post-harvest losses in food and agricultural Commodities in India between 20-50 percent, which is worth thousands of crores of rupees.***

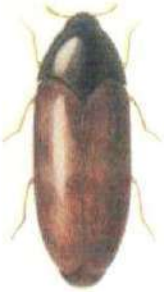
These losses are primarily due to insect infestation, microbiological contamination, and physiological changes due to sprouting, ripening, and senescence. With progressive increase in the quantity of food grains and necessity for longer storage periods, these losses will escalate unless disinfestations measures are improved.

The pulses quality further degrades due to infestation. The infestation depends on:

- Moisture content
- Irrelative humidity
- Temperature storage structures.
- Storage period
- Processing
- Hygienic condition
- Fumigation frequency

Apart from infestation storage losses are also caused by

- Insects
- Rodents

Name of pest	Figure of pest	Nature of damage
1.Pulse beetle Callosobruchussps		The larvae bore into grains and feed the entire content of the grain leaving only the shell (seed coat) behind. Adults cut out circular holes in seeds. Sometimes these insects begin their infestation, when the pods are in the ripening stage in the field, and are subsequently carried with the grains into the store after harvest. These pests pulses.
2. Khapara beetle Trogoder-magrana-rium (Everts)		i) Larvae are one of the most serious stored grain pests. ii) The larvae starts feeding from embryo point and later consume the entire kernel, which makes the grain hollow and only the husk remains. iii) Infested grains are full with frass, cast skins of larvae and excreta, which results in deterioration of quality of grains. iv) The larvae are often found on edges of jute staks and make the infested store unhygienic.
3. Dried bean weevil Acanthoscel-idesobtectus (Say)		i) Infestation is induced in the field on ripening of crop when pods are split. ii) Larvae feed on the seed by boring.
4. Rice moth **Corcyra** cephalonica (Stainton)		i) Larvae contaminate the food grains with dense webbing, excreta and hairs. ii) Whole grains are bound into lumps.

5.Confu-sed flour beetle Tribolium confusum J.du V.		i) Beetle and larvae both feed on broken and damaged seeds produced by milling and handling or attacked damaged seeds of other insects.
6. Rodents		i) Rodents feed whole grains and split pulses. ii) They also cause mechanical damage to gunny bags and other storage structures of Bengal gram by cutting, which results spilling of grains. iii) They spill more grains than they consume. iv) Rodents also contaminate Bengal gram by hair, urine and feces.

8.7 Summary of Major Problems and Key Technology Missing in the Cluster

The cluster has huge potential but there are some major problems that are hindering the growth of the cluster. The following are the key issues

- The cluster lacks a dedicated raw material purchase mechanism.
- The cluster is adopting age old technologies which are hindering the growth of cluster.
- The cluster lacks dedicated Cold storage centre and warehouse.
- The cluster products have very huge market and demand but the marketing methodologies adopted are incapable to capture the market for profitability.
- The cluster lack grading, sorting and polishing facility as result, proper price tagging of the raw material and processed pulses is difficult.
- The cluster lack advance training and R&D/Value added product development centre to address the problems faced by the cluster and for developing advance methodologies for sustainability and accelerated growth.
- The cluster has not bench marked its products and it is very important to setup a quality testing unit for assessing the quality of products manufactured and improve quality of export.

The country is facing huge food crises and this is due to the reasons mentioned above, these reasons are causing heavy damages to the cluster members and at the same time loss of food production is leading to high market pricing and high demand and supply gap.

It has been discussed in the report under import and export section that, though India is one of the largest producers of pulses but still need to import nearly 18 million tones of pulses every year. The gravity of import is double than the total production quantity. This can be reduced by immediately addressing the problems mentioned above.

8.8 Hard Interventions Proposed

The DSR recommends the establishment of Common Facility Centre with following Hard Interventions

- CFC with Automatic Pulses dryers
- CFC with Automatic Fine Cleaning and Size Grading Facility
- CFC with Automatic Colour Sorting Facility
- CFC with Automatic Pulses Polishing Machine
- Common Packaging center with Automatic Pouch and Bag Packing Machines
- Common testing facility for Pulses of BIS and FSSAI Standards
- Common raw material purchase, marketing and Export Centre.
- Cold Storage Facility.
- Value Added Product Development Centre
- Pulses Processing Research and Training Centre

8.8.1 Description of some of the technological interventions suggested

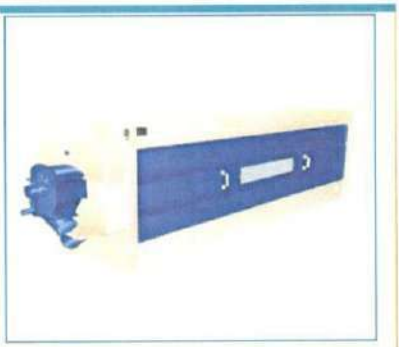
Grading Center

Grading is a process in which the quality of the pulse is determined by analyzing the pulses with that of the quality norms put forth by the governing agricultural agencies. Grading help to categories the pulses raw material

The grading center will have the following machineries as shown below

Thickness Grader

Length Grader



Size Grader

Cleaning Center

Cleaning is a process in which the Pulses are separated from husk and other impurities. The cleaning process gives the final material ready for processing the pulses. It removes the impurities like soil, husk, and stones from the raw material brought by the farmers.

Gravity separator

Vibro Cleaner

SCY Series Drum Sieve

De-Stoner

Emery Roll Polisher

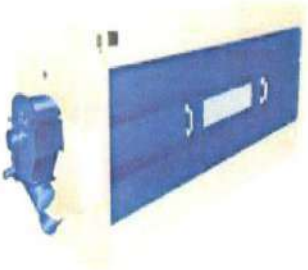
Seed cleaner

Common Sorting Center

A pulse sorting method serves to continuously and quickly detect the appearance quality of the pulses. The pulse sorting device includes a feeding mechanism and a scattering mechanism where the pulses are separately scattered over the surface of a conveying belt. The conveying belt serves to transfer the pulses to a photographing section where they are photographed and inspected by an electric coupling device. Various parameters of the pulses are calculated and the inspected results are compared with data stored in a computer. The pulses are then sorted into different classifications and respectively collected by a discharging device.

Pulses color sorter

Pulses color sorter



Pulses size sorter

Benefit of Sorting:

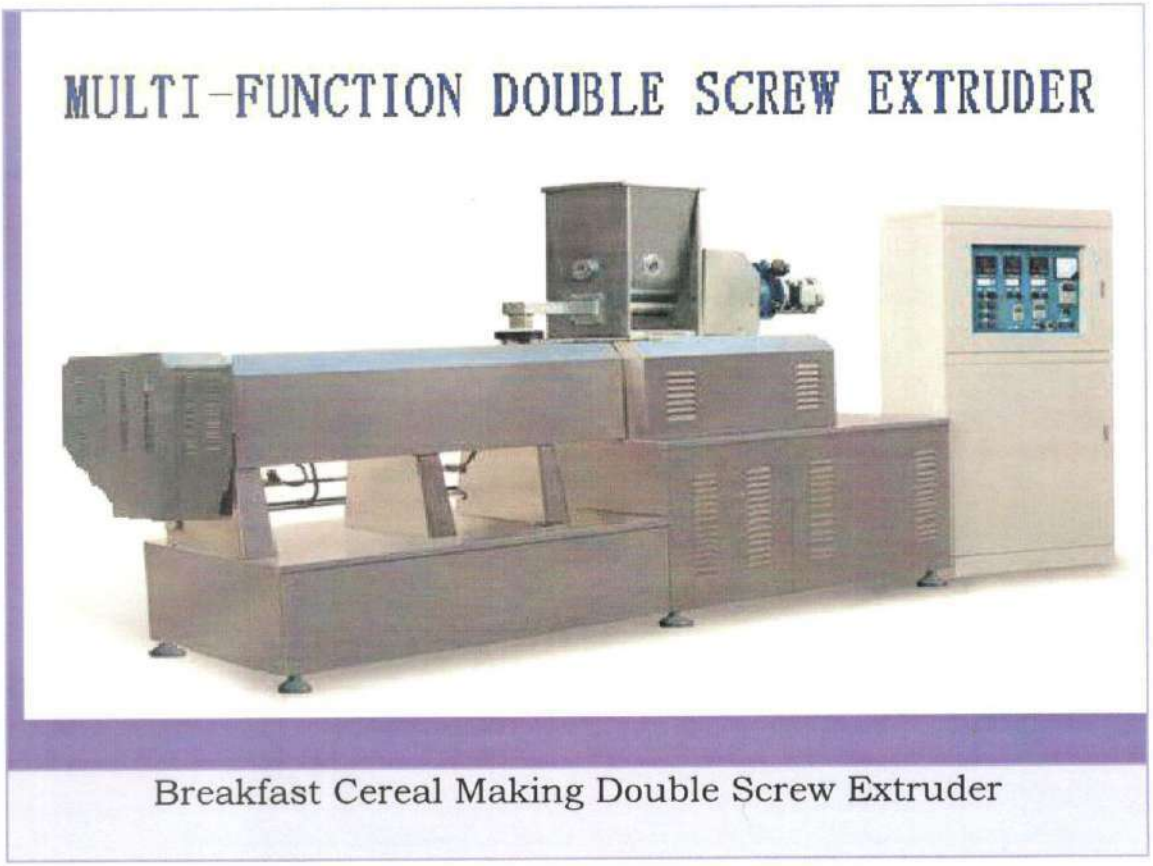
The benefits from these sorting machines are enormous for the quality parameters of the pulses. The final dhal obtained from these machines are of high quality and marketable standard. The sorting will remove the burnt out dhal during processing. Thus make the product look homogenous and appealing.

Value Added Products Development Centre

Pulses are the most vastly consumed crop throughout the Indian sub continent and it also has a high nutrient value.

Pulses are useful in various ways both as human food and animal feed. As human food pulses are used as *'dhal* (split seed without seed coat), whole seed, and green vegetable to supplement cereal-based diets. The seed by-products from the *'dhal* mills are used as animal feed. pulses leaves are used as dry or green fodder.

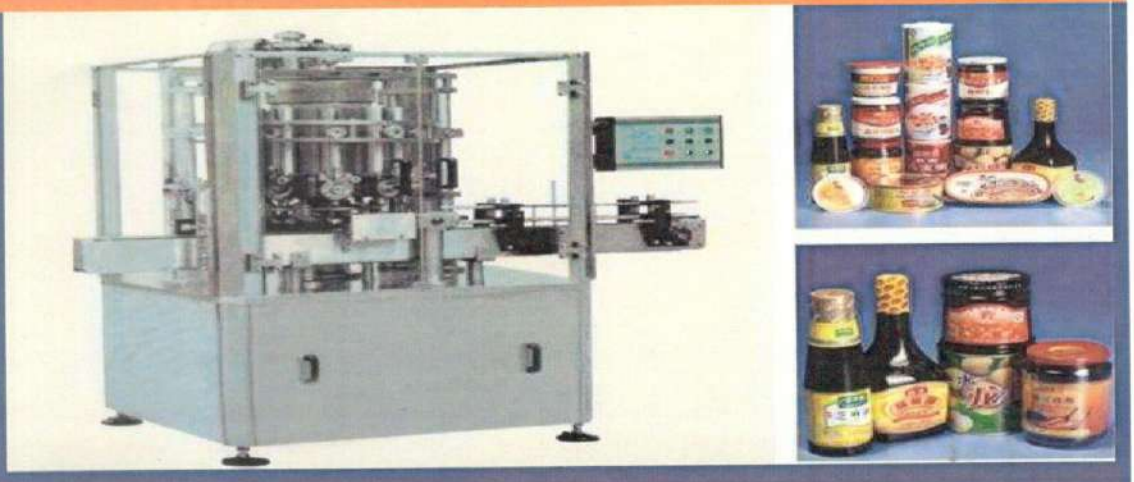
The project investigates the market for consumer-ready pulse products in abroad, India with the goal of identifying potential opportunities to further develop secondary processing in pulses and the opportunities for processing consumable products in India and exporting it to North American continent.



Breakfast Cereal Making Double Screw Extruder

Papad Making Machine

Grinding Machine



Canned Curry Making Machine

Chapter9

SWOT Analysis of the Cluster

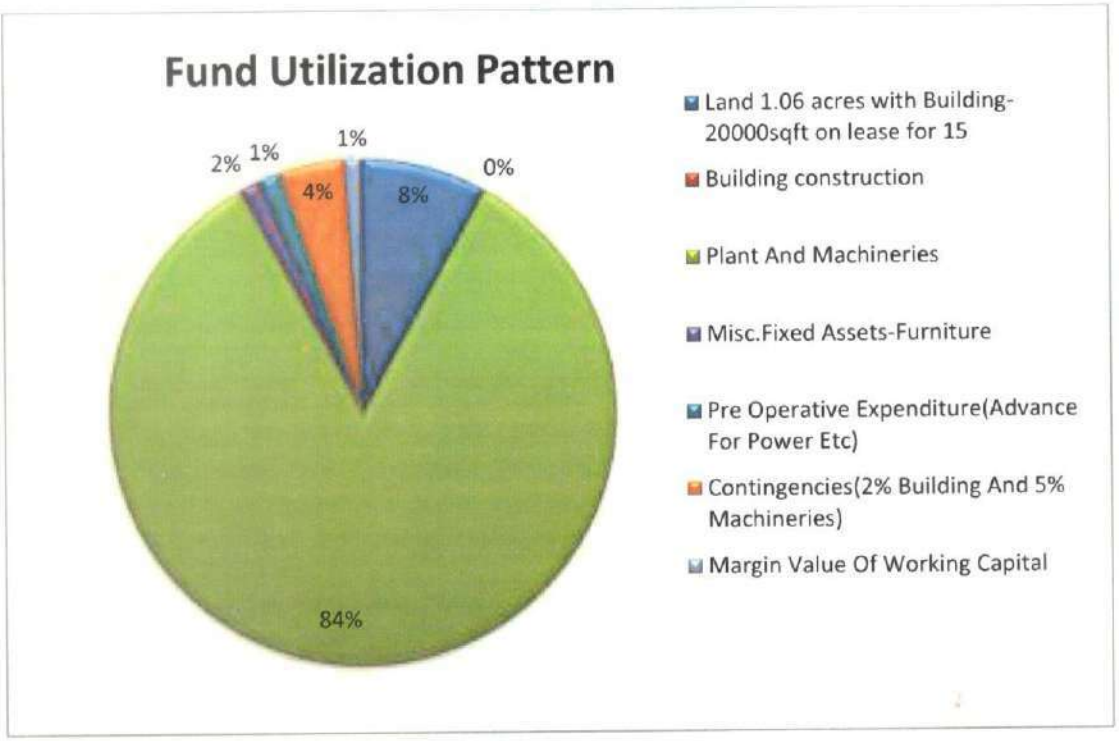
Parameters	Strength	Weakness	Opportunity	Threats
Unit	The Sri Mahalakshmi Pulses Mills cluster consists of 119 units which are brought under one umbrella of SPV and have good collaboration and coordination	No upgradation is taking place to meet the present demands of the industry. Technologically Backward status	The units willingness to join together to form a major large scale Pulses industry	Due to the weakness mentioned the cluster face a threat of closure or natural death There is a stiff completion from large scale industries
Inputs Availability	* Bulk supply of raw materials at Competitive price. * Local resources available.	* Controlled MSP of pulses & Compulsion of levy. * Non Exporters, production cost high.	*Large Domestic /International Market available. * Potential for non exporting units to Export. * Available Institutional support may be exploited	Imposition of taxes & levies in comparison to neighboring states may further lead to closure/shift of industries to neighboring States.
Innovation Capacity	* Capability to produce world class quality * Ability to run standardized machines	* Technological support not easily approachable and available at Cluster location.	* establishment of CFC, R&D centre & Induction of QMS etc. may lead to higher productivity market scope & efficiency	* Without induction of innovative business tools the trade may lack behind & die.
Markets	*Strong presence in national & Domestic market. *Market support available under Levy/CMR Policy *Most suitable climatic environment	* Long 4 months off season for majority of units *Weak Brand equity of units * Compulsory & controlled marketing for levy price.	*Tremendous exports potential *Substantial institutional support Available. *Non-exporting units to club for common brand and export.	*Strong competition from Asian Countries.

Parameters	Strength	Weakness	Opportunity	Threats
Skills	Workers mostly skilled for traditional technology	No Skill up gradation training. No pulse processing training Institute available in the region	Increased technical & managerial awareness & trainings may lead to productivity, quality and efficiency	Skill base needs up gradation. Lack of skill up gradation may lead to further backwardness of the industry
Labor	It is available as local people are enthusiastic to work and there is abundance of workforce available and they are economical	Since the dhal industry is a seasonal industry i.e 8-10 months the labor community is left with no work or opportunity to earn in the remaining months.	The dhal industry can be made to work through the year by producing value added products and other products that use dhal as their ingredients (eg red gram ketch up cereals etc)and by up grading the labor skills	Due to non availability of work mass migration of labor can take place to neighboring states resulting in vacuums of labor (no labors to work) and this may become one of the factors for closure.
Business Environment	Ability of Export segment to grow & meet International challenges	controlled trade may create little uneasiness in business	Tremendous growth potential with Institutional & Policy support.	Improper policies may hinder the growth trends
Technology	* Low cost fabricated machines * Technological infrastructure available.	*High production /automatic plants very costly & mostly imported beyond reach of individual unit. *Locally fabricated plant are unstandardized & low productive	The CFC can solve this problems and Can handle tons of raw materials and increase the productivity. Can handle both domestic and international markets and can also stabilize the market.	* Traditional Technology, leading to high production cost may retard the industry both at domestic / International Market.
Raw materials	The strategic location of the cluster provides it with abundant supply of raw pulses for production	In adequate use of technology and traditional methods are hindering the process and leading to low grade dhal production.	By using up graded and state of art technology the problem can be solved	Due to the weakness the market share of the cluster can be taken over by other states and large scale industries.

Chapter10
Project Financials and Implementation Schedule

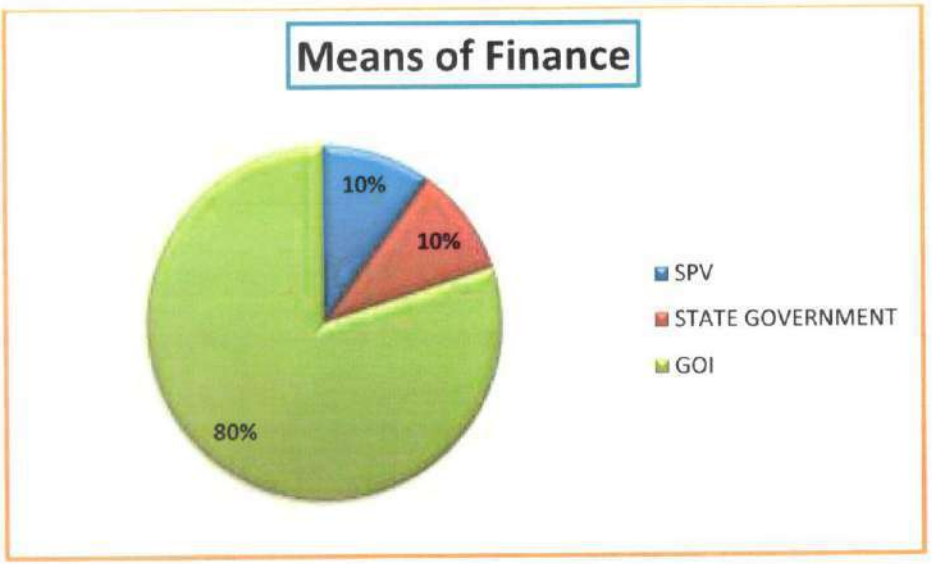
10.1 Project Cost and Fund Utilization Pattern

Sl. No.	Particulars Of Cost	Amount In Rs	% OF PROJECT COST
1	Land 1.06 acres with Building-20000sqft on lease for 15	120.00	8.09
2	Building construction	0.00	0.00
3	Plant And Machineries	1,244.82	83.94
4	Misc.Fixed Assets-Furniture	20.00	1.35
5	Pre Operative Expenditure(Advance For Power Etc)	20.00	1.35
6	Contingencies(2% Building And 5% Machineries)	62.24	4.20
7	Margin Value Of Working Capital	16.00	1.08
	Total Project Cost	**1,483.06**	**100.00**



10.2 Means of Finance

Sl. No.	Agency	Amount In Lakhs	% Of Project Cost
1	SPV	148.31	10.00%
2	STATE GOVERNMENT	148.31	10.00%
3	GOI	1,186.45	80.00%
	TOTAL	**1,483.06**	**100%**



Land and Building

The SPV proposes to lease an already constructed Building for the Processing section, dimensions 100FTX200FT. The Building will have floor platforms where the Processing of Pulses will take place.

11.4 Water Requirement

The water require by the CFC is estimated to be about 10,000 liters per day and the same will be made available through borewell as the cluster region has very good ground water availability.

10.5 Power Requirement

SL. No.	Particulars	Power in KVA	units consumption per day-8 hours shift	Amount (Rate per unit=Rs. 6/-	Amount per Annum (300 working days)
	Pre-Processing Section				
1	Automatic Pulses Cleaning, Grading and Destoning Setup	10	80	560	168000
2	Automatic Pulses Dryer	20	160	1120	336000
	Post Processing Section				
3	Automatic Colour Sorting Machine Setup	20	160	1120	336000
4	Automatic Pulses Polishing Machine Setup	52	416	2912	873600
5	Automatic Metal Detector Setup	8	64	448	134400
	Packaging Section				
6	Pouch Packing Machine for Pulses	10	80	560	168000
7	Pouch Packing Machine for Pulses	5.5	44	308	92400
8	Bag Packing Machine for Pulses	4.5	36	252	75600
	Storage Section and Material Handeling Section				
9	Cold Storage for Pulses	70	560	3920	1176000
10	Weigh Bridge	5	40	280	84000
	Testing Laboratory Setup				
16	Testing Laboratory Setup	1	8	56	16800

17	Breakfast cereal making mixture and Extruder	5	40	280	84000
18	canned curry ready to mix pulses making machine setup	5	40	280	84000
19	Pulses grinding machine	5	40	280	84000
	Office and Training Setup	9	72	504	151200
32	Environmental Section	30	240	1680	504000
	TOTAL	**260**	**2080**	**14560**	**4368000**

Total Power Required is 260KVA Load Sanction

10.6 Manpower Requirement

Manpower Required for Operation and Maintenance of CFC

Sl. No	Particulars	Employs	Salary/Month	Total Salary/Month	Annum	Variable	Fixed
1	Plant Supervisors	1	35000	35000	420000		420000
2	Electrician	1	25000	25000	300000	300000	
3	Maintenance Engineer	2	32000	64000	768000		768000
4	Maintenance Assistant	2	25000	50000	600000		600000
5	Cold Storage Supervisor	2	28000	56000	672000		672000
	Cleaning Section Supervisor	2	18000	36000	432000		432000
	Sorting and Grading Section	2	18000	36000	432000		432000
	Packing Section Supervisor	4	18000	72000	864000		864000
6	Purchase/Sales Manager	2	15000	30000	360000		360000
7	Lab Staff	2	15000	30000	360000	360000	
8	Workers/Plant Helpers/Operators	12	12000	144000	1728000	1728000	
	Total	**32**			**6936000**	**2388000**	**4548000**

Administrative Staff

Administrative Staff							
Sl. No.	**Particulars**	**Employees**	**Salary/month**	**total Salary/month**	**Annum**	**VARIABLE**	**FIXED**
1	Receptionist	1	15000	15000	180000		180000
2	Accountants	1	18000	18000	216000		216000
3	clerk	1	15000	15000	180000		180000
4	office boys	1	12000	12000	144000		144000
5	sweepers	2	8500	17000	204000		204000
6	security	2	10000	20000	240000		240000
	Total	**8**			**1164000**	0	1164000
						2388000	**5712000**

Total Manpower	**40**
Total Salaries	8100000
Rs. Lakhs	**81**

Total Manpower or Employment at the CFC will be 40 persons with annual salary requirement of Rs. 81 Lakhs.

10.7 List of Machineries Proposed

List of Machinery-Pulses Cluster, Andhra Pradesh							
SL. No.	Particulars	Technical Specification	Quantity	Rate Rs.	Amount	FOB Price (Amount+20%)	in Lakhs
	Pre-Processing Section		**setup**				
1	Automatic Pulses Cleaning,	4 Tons per Hour, fully Automatic with Elevators and Conveyers System	1	8752500	8752500	10765575	107.65575
2	Automatic Pulses Grading and Dryer	4 Tons per Hour, fully Automatic with Elevators and Conveyers System	1	9350000	9350000	11500500	115.005
	Post Processing Section		**setup**				
3	Automatic Colour Sorting Machine Setup	2 Tons per Hour, fully Automatic with Elevators and Conveyers System	2	6512000	13024000	16019520	160.1952
4	Automatic Pulses Polishing Machine Setup	4 Tons per Hour, fully Automatic with Elevators and Conveyers System	1	7528000	7528000	9259440	92.5944
5	Automatic Metal Detector Setup	4 Tons per Hour, fully Automatic with Elevators and Conveyers System	1	2630000	2630000	3234900	32.349

	Packaging Section		setup				
6	Pouch Packing Machine for Pulses	250grams to 1KG, 6head weigh filler, pillow pouch with centre seal	1	3660000	3660000	4501800	45.018
7	Pouch Packing Machine for Pulses	1kg to 5kg pillow pouch packing, 6head weigh filler	1	4460000	4460000	5485800	54.858
8	Bag Packing Machine for Pulses	5kg to 50 kg, 2head filler, pre-made bag with liner	1	7184000	7184000	8836320	88.3632
	Storage Section and Material Handling Section		setup				
9	Cold Storage/Clean Room Storage for Pulses	1000MT cold storage with Temp-8 to 20 Degree, Refrigerant-R-404A -30TR	1	11600291	11600291	14268358	142.6835793
10	Weigh Bridge	60tons capacity, load cell based, 12mx3m bridge	1	1205000	1205000	1482150	14.8215
11	Hydraulic Pallets-Hand Operated	capacity 50kg	4	32000	128000	157440	1.5744
12	Full Electric Stacker	capacity-500kg	2	385000	770000	947100	9.471
13	Weigh Scale Pallet Truck	capacity 100kg	1	95000	95000	116850	1.1685
14	Universal Weighing Scale	weigh capacity up to 100 kg with digital meter	1	115000	115000	141450	1.4145
15	Bag Unloading System	capacity up to 500kg	2	2168800	4337600	5335248	53.35248

	Testing Laboratory Setup						
16	Testing Laboratory Setup	nutrition value testing, ingredient testing, minerals testing and food safety testing, testing for pesticides and microbs-FSSAI Grade	1	2600000	2600000	3198000	31.98
		Value Added Products-Processing Setup					
17	Breakfast cereal making mixture and Extruder	1/2Ton per hour	1	1665000	1665000	2047950	20.4795
18	canned curry ready to mix pulses making machine setup	1/2 Ton per hour	1	1425000	1425000	1752750	17.5275
19	Installation Accessories	Compressor, Blower, UPS, AC Machine and ducting, Elevators, Screw Conveyers,	1	3685000	3685000	4532550	45.3255
	Office and Training Setup						
20	Computers, Windows Software	i7 Processor, Flat LED/LCD Screen-19", 1TB HDD, 2.4GHz DDR RAM	5	45000	225000	276750	2.7675
21	Digital Interactive Classroom Board	size:120", Wall-mount or portable floor stand, Speed- First dot (dick): 25ms, Continuous dots (writing):8ms, Writing	1	145600	145600	179088	1.79088

		Tools: Pen, finger, pointer and any other objects					
22	High Resolution Projector with Auto Lock ScreenProjector with Auto Lock Screen	HD DLP BUSINESS PROJECTOR WITH 3000 ANSI LUMENS, Image Brightness: 3000 ANSI Lumens, Aspect Ratio: 4.3, Resolution: 1024 x 768, Single chip DLP® LVDS, Auto Sync Up to : NTSC [M, 3.58, 4.43), Projector Lens: 480i/p, 576i/p, 720p (50/60 Hz), 1080i, Projection Distance: 1.2m ~ 10m (3.94 ft ~ 32.81 ft Deluxe Grade - 6 x 8 Tripod Screen 120" Projector Screen with Stand (1.905mtr x 2.49mtr)	1	48500	48500	59655	0.59655
23	Audio System Amplifier, Speakers with Cordless and Podium Mic-set	mixer amplifier of rated output 160 Watts with built-in MP3 Digital Player, USB drives & SD/MMC cards, reproducing, 2 In 1 Wireless And Wired Professional Microphone, FM Frequency: 109MHz-	1	52600	52600	64698	0.64698

		113MHz, Frequency Response: 100-10,000Hz, Mic Stand, Speaker **Set 4** wall mounted 60 watt					
24	All in One Laser Colour Printer Scanner and Copier	LaserJet Pro, Multifunction Printer - P/S/C/F+ Duplexor+Wi-fy Print, Copy, Scan and Fax Functionality, 50 page Automatic Document Feeder Two Sided Scan and Copy, ePrint Support, Wireless and Ethernet Connectivity HP Smart Install Support, HP Auto-On/Auto-Off Technologies Inbuilt USB Port, Print from USB, Scan to USB, Inbuilt Colour Touch screen SUPC: SDL274675796, support A4, A5 Papers	1	46950	46950	57748.5	0.577485
25	Accounting Software-Tally	Tally 10 and above software package single license for accounting	1	285000	285000	350550	3.5055
26	Website and ERP Software Design and Development	Dynamic Website with ERP Supporting Server Package including warehouse management	1	685000	685000	842550	8.4255

		software					
27	CCT Camera and DVR and EPABX Intercomm setup	CCTV Cameras with Night Vision: 10 DVR Recorder =2 and Cables: 3000 meter 4 way MOTOROLA 5 MILES WALKIE TALKIE= 2 set , EPABX PABX Intercom system telephone 105 with x5 Beetel Phone Set, Intercom to Intercom dialing, Single digit call pickup, Call transfer, Jumper based programming, 95 Dial Lock	1	65850	65850	80995.5	0.809955
28	Fire fighting Equipments-set	CAN TYPE: 5 N0.s Buckets with mount=5 Ceasefire ABC Powder/foam based Fire Extinguisher (MAP 90) - 4 kg, ABC extinguishers are effective against Class A, B and C fires as well as Electrical fires	1	2575000	2575000	3167250	31.6725
29	Airconditioner A/C 2.0 Ton	2.0T A/C with Low Power Drive Module	2	151490	302980	372665.4	3.726654
30	DG Set	250 KVA-Sielent Generator, with Change	1	1449235	1449235	1782559.05	17.8255905

		over control Pannel with wiring					
31	Electrical Installations-Transformer, Cables, Control Pannels with wiring	800kva with wiring and controls	1	4725000	4725000	5811750	58.1175
32	Environmental Section	ETP-25KLD and Rainwater harvesting-25kld	1	3384000	3384000	4162320	41.6232
33	Installation and commissioning cost	including fabrication of platforms, foundation etc	1	3000000	3000000	3690000	36.9
34							
	TOTAL			**91711816**	**98205106**	**124482280**	**1244.82**

10.8 Revenue Generation Section

Revenue Generation Section	
PARTICULARS	AMOUNT
1-Plant/MACHINE NAME-Cold Storage/Clean Room Storage	
Storage of Processed Pulses	Presently there is not even a single Cold Storage in the Cluster
COST OFMACHINE in INR	14268357.93
capacity:1000 MT	1000
USER CHARGE PER Tonn/Month	1500
NUMBER OF WORKING Months	12
TOTAL REVENUE/ANNUM	18000000
PARTICULARS	AMOUNT
2-Plant/MACHINE NAME-Automatic Pulses Cleaning, Grading and Drying Setup	
Cleaning	Presently this machine is not available in the Cluster
COST OFMACHINE in INR	25500975
capacity: 4 T/h	4
USER CHARGE PER Tonn	2800
NUMBER OF WORKING HOURS/DAY	8
total processing quantity/day	32
Total revenue/day in INR	89600
NUMBER OF WORKING DAYS/ANNUM	300
TOTAL REVENUE/ANNUM	26880000

PARTICULARS	**AMOUNT**
3-Plant/MACHINE NAME-Automatic Colour Sorter	
Pulses Colour Sorter	**Presently this machine is not available in the Cluster**
COST OFMACHINE in INR	16019520
capacity: 4 T/h	4
USER CHARGE PER Ton	1800
NUMBER OF WORKING HOURS/DAY	8
total processing quantity/day	32
Total revenue/day in INR	57600
NUMBER OF WORKING DAYS/ANNUM	300
TOTAL REVENUE/ANNUM	**17280000**
PARTICULARS	**AMOUNT**
4-Plant/MACHINE NAME-Automatic Polishing Machine	
Pulses Fine Polishing	**Presently this machine is not available in the Cluster**
COST OFMACHINE in INR	9259440
capacity: 4 T/h	4
USER CHARGE PER Ton	1000
NUMBER OF WORKING HOURS/DAY	8
total processing quantity/day	32
Total revenue/day in INR	32000
NUMBER OF WORKING DAYS/ANNUM	300
TOTAL REVENUE/ANNUM	**9600000**
PARTICULARS	**AMOUNT**
PARTICULARS	**AMOUNT**

5-Plant/MACHINE NAME-Pulses Automatic Bag Packaging Machine	
Pulses Bag Packing Machine	**Presently this machine is not available in the Cluster**
COST OFMACHINE in INR	8836320
capacity: in Bag /Hour (25 kg each)	300
USER CHARGE PER Bags	12
NUMBER OF WORKING HOURS/DAY	8
total processing quantity/day	2400
Total reveue/day in INR	28800
NUMBER OF WORKING DAYS/ANNUM	300
TOTAL REVENUE/ANNUM	**8640000**
PARTICULARS	**AMOUNT**
6-Plant/MACHINE NAME-Pulses Pouch Packaging Machine	
Pulses Pouch Packing Machine	**Presently this machine is not available in the Cluster**
COST OFMACHINE in INR	4501800
capacity: in Pouch/Hour (250gm to 1000 gm)1500 pouch/h	1500
USER CHARGE PER Pouch	1.5
NIMBER OF WORKING HOURS/DAY	8
total processing quantity/day	12000
Total reveue/day in INR	18000
NUMBER OF WORKING DAYS/ANNUM	300
TOTAL REVENUE/ANNUM	**5400000**
PARTICULARS	**AMOUNT**
7-Plant/MACHINE NAME-Pulses Pouch Packaging Machine	
Pulses Pouch Packing Machine	**Presently this machine is not available in the Cluster**
COST OFMACHINE in INR	5485800
capacity: in Pouch/Hour (1000gm to 5000 gm)1500 pouch/h	1500

USER CHARGE PER Pouch	1.5
NIMBER OF WORKING HOURS/DAY	8
total processing quantity/day	12000
Total reveue/day in INR	18000
NUMBER OF WORKING DAYS/ANNUM	300
TOTAL REVENUE/ANNUM	**5400000**
PARTICULARS	**AMOUNT**
8-Plant/MACHINE NAME-Pulses Testing Setup	
Pulses Testing Setup	**Presently this machine is not available in the Cluster**
COST OFMACHINE in INR	3198000
capacity: 80 test per day	80
USER CHARGE PER test	100
NUMBER OF WORKING HOURS/DAY	8
total processing quantity/day	80
Total reveue/day in INR	8000
NUMBER OF WORKING DAYS/ANNUM	300
TOTAL REVENUE/ANNUM	**2400000**
PARTICULARS	**AMOUNT**
9-Plant/MACHINE NAME-Pulses Weigh Bridge	
Pulses Weigh Bridge	**Presently this machine is not available in the Cluster**
COST OFMACHINE in INR	1482150
Weingh Loads/Day	20
USER CHARGE PER weighing	150
NIMBER OF WORKING HOURS/DAY	8
total processing quantity/day	20
Total reveue/day in INR	3000

NUMBER OF WORKING DAYS/ANNUM	300
TOTAL REVENUE/ANNUM	**900000**
PARTICULARS	**AMOUNT**
10-Plant/MACHINE NAME-Pulses Value Added Product Development Centre	
Pulses Value Added Products Development	**Presently this machine is not available in the Cluster**
COST OFMACHINE in INR	8333250
capacity: 1/2 ton/h	1.00
USER CHARGE PER ton	3000
NIMBER OF WORKING HOURS/DAY	8
total processing quantity/day	8
Total reveue/day in INR	24000
NUMBER OF WORKING DAYS/ANNUM	300
TOTAL REVENUE/ANNUM	**7200000**

11	**TRAINING AND RESEARCH SECTION**						
SL. NO.	**PARTICULARS**	**PARTICIPANTS/BATCH**	**BATCH DURATION**	**Charge/ Candidate/course**	**Revenue/ Batch**	**No. of Batches/Year**	**Total Revenue**
1	Training on Food Safety and Food Standards	25	3Months	8500	212500	2	425000
2	Training on Entrepreneurship and Financial Management	25	3Months	18400	460000	2	920000
3	Training on Pulses Production best practices and Application	25	3Months	25000	625000	2	1250000
4	Training on Value Added Product Development	25	3Months	20000	500000	2	1000000
	Section 4 Total	125					3595000

Summary of Revenue Generation

Sl. No.	Revenue Section	Annual Revenue
1	Storage of Processed Pulses	18000000
2	Cleaning, Grading and Destoning	26880000
3	Pulses Colour Sorter	17280000
4	Pulses Fine Polishing	9600000
5	Pulses Bag Packing Machine	8640000
6	Pulses Pouch Packing Machine	5400000
7	Pulses Pouch Packing Machine	5400000
8	Pulses Testing Setup	2400000
9	Pulses Weigh Bridge	900000
10	Pulses Value Added Products Development	7200000
11	TRAINING AND RESEARCH SECTION	3595000
	Total	**105295000**

10.9 Expenditure Statement

	EXPENSES				
Sl. No.	Particulars of the Material	quantity/ annaum	Rate	amount/ annuum	
				Rs.	lakhs
1	Cold Storage Coolent-Ammonia-kg @800kg/month	9600	125	1200000	12
2	Packing Material-pouches	3600000	0.5	1800000	18
3	Packing Material-pouches	720000	5.5	3960000	39.6
4	Manpower Required for Operation and Maintenance of CFC			8100000	81
	Total			**15060000**	**150.6**

Chapter 11

Project Financial Feasibility Analysis at 100% Capacity

11.1 Project Cost and Means of Finance

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Years		0	1	2	3	4	5	6	7	8	9	10
PROJECT COST												
Land & Buildings 15 years on lease		120.00	8.1%									
Plant and Machineries		1244.82	83.9%									
Miscl Fixed Assets		20.00	1.3%									
Pre operative expenses &Preliminary expenses		20.00	1.3%									
provision for Contingencies		62.24	4.2%									
Margin Money		16.00	1.1%									
TOTAL PROJECT COST		1483.06	100%									
SOURCES												
SPV	10%	148.31										
State Govt	10%	148.31										
GoI	80%	1186.45										
Bank Borrowings		0.00										
Total Project cost		1483.06										
GRANTS												
OPENING BALANCE		0.00	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06
GRANT		1483.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0 REPAYMENTS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CLOSING BALANCE OF TERM LOANS		1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06
INTEREST ON TERM LOANS BALANCE	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

11.2 Depreciation Calculation

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Land & Site Development		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
less Depreciation	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Value		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Buildings		120.00	120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49
additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		120.00	120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49
less Depreciation	10%	0.00	12.00	10.80	9.72	8.75	7.87	7.09	6.38	5.74	5.17	4.65
Net Value		120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49	41.84
Plant & Machineries		1244.82	1244.82	1071.67	922.60	794.27	683.78	588.67	506.79	436.29	375.60	323.36
additions/deletions												
Total Gross value		1244.82	1244.82	1071.67	922.60	794.27	683.78	588.67	506.79	436.29	375.60	323.36
less Depreciation	14%	0.00	173.15	149.07	128.33	110.48	95.11	81.88	70.49	60.69	52.25	44.98
Net Value		1244.82	1071.67	922.60	794.27	683.78	588.67	506.79	436.29	375.60	323.36	278.38
Mis fixed Assets		20.00	20.00	16.38	13.42	10.99	9.00	7.37	6.04	4.94	4.05	3.32
additions/deletions												
Total Gross value		20.00	20.00	16.38	13.42	10.99	9.00	7.37	6.04	4.94	4.05	3.32
less Depreciation	18%	0.00	3.62	2.96	2.43	1.99	1.63	1.33	1.09	0.89	0.73	0.60
Net Value of		20.00	16.38	13.42	10.99	9.00	7.37	6.04	4.94	4.05	3.32	2.72
pre operative expenses		20.00	20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68

additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		20.00	20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68
less Depreciation	20%	0.00	4.00	3.20	2.56	2.05	1.64	1.31	1.05	0.84	0.67	0.54
Net Value		20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68	2.15
provision for contingencies		62.24	62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11
additions/deletions												
Total Gross value		62.24	62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11
less Depreciation	10%	0.00	6.22	5.60	5.04	4.54	4.08	3.68	3.31	2.98	2.68	2.41
Net Value		62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11	21.70
TOTAL ASSETS & DEPRECIATION												
Gross value		**1467.06**	**1467.06**	**1268.06**	**1096.43**	**948.35**	**820.54**	**710.20**	**614.91**	**532.59**	**461.46**	**399.96**
additions/deletions		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Gross value		**1467.06**	**1467.06**	**1268.06**	**1096.43**	**948.35**	**820.54**	**710.20**	**614.91**	**532.59**	**461.46**	**399.96**
less Depreciation		**0.00**	**199.00**	**171.64**	**148.08**	**127.80**	**110.34**	**95.29**	**82.32**	**71.14**	**61.50**	**53.18**
NET VALUE OF FIXED ASSETS		**1467.06**	**1268.06**	**1096.43**	**948.35**	**820.54**	**710.20**	**614.91**	**532.59**	**461.46**	**399.96**	**346.78**

11.3 Working Capital

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Raw Materials (Raw Materials)	1.10		38.39	38.39	38.39	38.39	39.88	39.88	39.88	39.88	39.88	39.88
Sundry Debtors (Revenues)	0.5		37.52	37.52	37.52	37.52	39.64	39.64	39.64	39.64	39.64	39.64
wages & salaries	1		6.95	7.16	7.38	7.60	7.83	8.06	8.30	8.55	8.81	9.07
Utilities	1		5.14	4.61	4.61	4.61	4.79	4.79	4.79	4.79	4.79	4.79
short Term loans and Advances(Rev)	0.25		18.76	18.76	18.76	18.76	19.82	19.82	19.82	19.82	19.82	19.82
Total Current Assets			106.76	106.44	106.66	106.88	111.95	112.18	112.43	112.68	112.93	113.20
Sundry Creditors(Materials)	1		24.01	24.01	24.01	24.01	25.37	25.37	25.37	25.37	25.37	25.37
Loans & Advances(Revenue)	0.25		18.76	18.76	18.76	18.76	19.82	19.82	19.82	19.82	19.82	19.82
Total Current Liabilities			42.77	42.77	42.77	42.77	45.18	45.18	45.18	45.18	45.18	45.18
Net Working Capital			63.99	63.67	63.89	64.11	66.77	67.00	67.24	67.49	67.75	68.01
Margin Money	25%		16.00	15.92	15.97	16.03	16.69	16.75	16.81	16.87	16.94	17.00
BALANCE W/C BANK FINANCE			47.99	47.75	47.91	48.08	50.07	50.25	50.43	50.62	50.81	51.01
INTEREST CALCULATION	15%		7.20	7.16	7.19	7.21	7.51	7.54	7.56	7.59	7.62	7.65

11.4 Capacity Utilization, Revenue Generation and Material Cost

			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
			0	1	2	3	4	5	6	7	8	9	10
Percentage utilisation			**100%**	**85%**	**85%**	**85%**	**85%**	**90%**	**90%**	**90%**	**90%**	**90%**	**90%**
Growth till full capacity													

PROJECTED REVENUE

Rs. Lakhs			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
REVENUE PROJECTIONS													
REVENUE			1017.00	864.45	864.45	864.45	864.45	915.30	915.30	915.30	915.30	915.30	915.30
TRAINING & RESEARCH			35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95
TOTAL REVENUE			1052.95	900.40	900.40	900.40	900.40	951.25	951.25	951.25	951.25	951.25	951.25
TOTAL REVENUE			**1052.95**	**900.40**	**900.40**	**900.40**	**900.40**	**951.25**	**951.25**	**951.25**	**951.25**	**951.25**	**951.25**
Growth %					**0%**	**0%**	**0%**	**6%**	**6%**	**0%**	**0%**	**0%**	

			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Rs. Lakhs			0	1	2	3	4	5	6	7	8	9	10
MATERIAL COST	%TO		100%										
	REVENUE												
MATERIAL COST	32%		150.60	288.13	288.13	288.13	288.13	304.40	304.40	304.40	304.40	304.40	304.40
TOTAL MATERIAL COST			**150.60**	**288.13**	**288.13**	**288.13**	**288.13**	**304.40**	**304.40**	**304.40**	**304.40**	**304.40**	**304.40**
OTHER INDIRECT MATLS	0%		0.53	0.45	0.45	0.45	0.45	0.48	0.48	0.48	0.48	0.48	0.48
TOTAL MATERIAL COST			**151.13**	**288.58**	**288.58**	**288.58**	**288.58**	**304.88**	**304.88**	**304.88**	**304.88**	**304.88**	**304.88**
TOTAL MATERIAL COST AS % REVENUE				**32%**	**32%**	**32%**	**32%**	**32%**	**32%**	**32%**	**32%**	**32%**	**32%**

11.5 Breakeven Analysis

			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Rs. Lakhs			0	1	2	3	4	5	6	7	8	9	10
VARIALBE EXPENSES	1												
Direct Materials	**14%**		**151.13**	**288.58**	**288.58**	**288.58**	**288.58**	**304.88**	**304.88**	**304.88**	**304.88**	**304.88**	**304.88**
Fuel cost	1%		10.53	9.00	9.00	9.00	9.00	9.51	9.51	9.51	9.51	9.51	9.51
Direct wages	3%	3 %	23.88	24.60	25.33	26.09	26.88	27.68	28.51	29.37	30.25	31.16	32.09
power	4%		43.68	37.35	37.35	37.35	37.35	39.46	39.46	39.46	39.46	39.46	39.46
Interest on Working Capital				7.20	7.16	7.19	7.21	7.51	7.54	7.56	7.59	7.62	7.65
TOTAL VARIABLE EXPENSES				**366.73**	**367.43**	**368.22**	**369.02**	**389.04**	**389.90**	**390.78**	**391.69**	**392.63**	**393.59**
TOTAL CONTRIBUTION(Rev-Variable cost)				**533.67**	**532.97**	**532.18**	**531.38**	**562.21**	**561.35**	**560.47**	**559.56**	**558.62**	**557.66**
FIXED EXPENSES	1		FBS										
Salaries & wages	7%	3 %	57.12	58.83	60.60	62.42	64.29	66.22	68.20	70.25	72.36	74.53	76.76
Power fixed	2.00%			18.01	18.01	18.01	18.01	18.01	18.01	18.01	18.01	18.01	18.01
Administration & Sales Expenses	1.5%			13.51	13.51	13.51	13.51	14.27	14.27	14.27	14.27	14.27	14.27
Repair and maintanence	1.5%			13.51	13.51	13.51	13.51	14.27	14.27	14.27	14.27	14.27	14.27
Interest on Term Loans				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation				199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
TOTAL FIXED EXPENSES				**302.85**	**277.25**	**255.52**	**237.11**	**223.10**	**210.04**	**199.12**	**190.04**	**182.57**	**176.49**
BREAKEVENREVENUE				510.97	468.39	432.31	401.78	377.49	355.93	337.95	323.07	310.89	301.05
BREAKEVEN POINT (41%)				**57%**	**52%**	**48%**	**45%**	**40%**	**37%**	**36%**	**34%**	**33%**	**32%**

11.6 Projected Profit and Loss

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
VALUE ADDED			**900.40**	**900.40**	**900.40**	**900.40**	**951.25**	**951.25**	**951.25**	**951.25**	**951.25**	**951.25**
MATERIAL COST-INDIRECT	32%		288.58	288.58	288.58	288.58	304.88	304.88	304.88	304.88	304.88	304.88
FUEL COST	1%		**9.00**	**9.00**	**9.00**	**9.00**	**9.51**	**9.51**	**9.51**	**9.51**	**9.51**	**9.51**
EXPENSES												
WAGES	3%		24.60	25.33	26.09	26.88	27.68	28.51	29.37	30.25	31.16	32.09
SALARIES	7%		58.83	60.60	62.42	64.29	66.22	68.20	70.25	72.36	74.53	76.76
POWER	10%		14.81	55.36	55.36	55.36	57.47	57.47	57.47	57.47	57.47	57.47
REPAIR & MAINTENANCE	2%		13.51	13.51	13.51	13.51	14.27	14.27	14.27	14.27	14.27	14.27
ADMINISTRATION & SELLING EXPENSES	2%		13.51	13.51	13.51	13.51	14.27	14.27	14.27	14.27	14.27	14.27
TOTAL EXPENSES	47%		**422.83**	**465.89**	**468.46**	**471.12**	**494.30**	**497.11**	**500.01**	**503.00**	**506.08**	**509.25**
OPERATING PROFIT(PBIDT)	53%		**477.57**	**434.51**	**431.94**	**429.28**	**456.95**	**454.14**	**451.24**	**448.25**	**445.17**	**442.00**
INTEREST WORKING CAPITAL	1%		**7.20**	**7.16**	**7.19**	**7.21**	**7.51**	**7.54**	**7.56**	**7.59**	**7.62**	**7.65**
PBDT	52%		**470.37**	**427.35**	**424.75**	**422.07**	**449.44**	**446.60**	**443.67**	**440.65**	**437.55**	**434.35**
DEPRECIATION	22%		199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
NET PROFIT BEORE TAX	30%		**271.37**	**255.71**	**276.66**	**294.26**	**339.10**	**351.31**	**361.35**	**369.52**	**376.05**	**381.17**
INCOME TAX	4%		38.91	37.09	40.63	43.59	50.56	52.57	54.22	55.54	56.59	57.41
NET PROFIT AFTER TAX	26%		**232.45**	**218.63**	**236.03**	**250.67**	**288.55**	**298.74**	**307.13**	**313.97**	**319.46**	**323.76**
NET PROFIT AS % TO NET REVENUE	0%		**26%**	**24%**	**26%**	**28%**	**30%**	**31%**	**32%**	**33%**	**34%**	**34%**
AVERAGE NET PROFIT TO REVENUE			**29.9%**									
CUMULATIVE PROFIT & LOSS			**232.45**	**451.08**	**687.11**	**937.79**	**1226.33**	**1525.07**	**1832.20**	**2146.17**	**2465.63**	**2789.39**

11.7 Cash Flow Statement

Rs. Lakhs	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10
SOURCES											
NET PROFIT BEORE TAX	0.00	271.37	255.71	276.66	294.26	339.10	351.31	361.35	369.52	376.05	381.17
Term Loans											
Govt. Grant	1483.06										
Promoters Contribution											
Increase in Bank borrowing		47.99	-0.24	0.16	0.17	1.99	0.18	0.18	0.19	0.19	0.20
Depreciation		199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
Others											
TOTAL SOURCES	**1483.06**	**518.36**	**427.11**	**424.91**	**422.23**	**451.44**	**446.78**	**443.85**	**440.84**	**437.74**	**434.54**
DISPOSAL OF FUNDS											
Preliminary expenses											
Capital Expenditure	1467.06										
Increase in Working Capital		63.99	-0.32	0.21	0.22	2.66	0.23	0.24	0.25	0.26	0.26
Decrease in Term Loans		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Income Tax		38.91	37.09	40.63	43.59	50.56	52.57	54.22	55.54	56.59	57.41
others											
TOTAL DISPOSAL OF FUNDS	**1467.06**	**102.90**	**36.77**	**40.85**	**43.81**	**53.22**	**52.81**	**54.46**	**55.79**	**56.85**	**57.67**
Opening cash balance	0.00	16.00	431.45	821.80	1205.86	1584.28	1982.50	2376.47	2765.86	3150.91	3531.80
Surplus/Deficit	16.00	415.46	390.34	384.06	378.42	398.22	393.97	389.39	385.05	380.89	376.87
Closing Cash Balance	**16.00**	**431.45**	**821.80**	**1205.86**	**1584.28**	**1982.50**	**2376.47**	**2765.86**	**3150.91**	**3531.80**	**3908.67**

11.8 Projected Balance Sheet

Rs. Lakhs	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10
ASSETS											
Gross Fixed Assets	1467.06	1467.06	1268.06	1096.43	948.35	820.54	710.20	614.91	532.59	461.46	399.96
less depreciation	0.00	199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
Net Fixed Assets	1467.06	1268.06	1096.43	948.35	820.54	710.20	614.91	532.59	461.46	399.96	346.78
Total Current Assets	0.00	106.76	106.44	106.66	106.88	111.95	112.18	112.43	112.68	112.93	113.20
Cash/Bank Balance	16.00	431.45	821.80	1205.86	1584.28	1982.50	2376.47	2765.86	3150.91	3531.80	3908.67
TOTAL ASSETS	**1483.06**	**1806.28**	**2024.67**	**2260.86**	**2511.70**	**2804.65**	**3103.56**	**3410.88**	**3725.04**	**4044.69**	**4368.65**
LIABILITIES											
RESERVES & SURPLUSES											
Govt. Grant	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06	1483.06
profit/Loss	0.00	232.45	451.08	687.11	937.79	1226.33	1525.07	1832.20	2146.17	2465.63	2789.39
TOTAL RESERVES & SURPLUSES	**1483.06**	**1715.52**	**1934.15**	**2170.18**	**2420.85**	**2709.39**	**3008.13**	**3315.26**	**3629.24**	**3948.69**	**4272.46**
Current Liabilities	0.00	42.77	42.77	42.77	42.77	45.18	45.18	45.18	45.18	45.18	45.18
Short Term Loans	0.00	47.99	47.75	47.91	48.08	50.07	50.25	50.43	50.62	50.81	51.01
TOTAL LIABILITIES	**1483.06**	**1806.28**	**2024.67**	**2260.86**	**2511.70**	**2804.65**	**3103.56**	**3410.88**	**3725.04**	**4044.69**	**4368.65**

11.9 Depreciation Calculation – Income Tax Method

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Land & Site Development		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
less Depreciation	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Value		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Buildings		120.00	120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49
additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		120.00	120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49
less Depreciation	10%	0.00	12.00	10.80	9.72	8.75	7.87	7.09	6.38	5.74	5.17	4.65
Net Value		120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49	41.84
Plant & Machineries		1244.82	1244.82	1058.10	899.38	764.48	649.81	552.33	469.48	399.06	339.20	288.32
additions/deletions												
Total Gross value		1244.82	1244.82	1058.10	899.38	764.48	649.81	552.33	469.48	399.06	339.20	288.32
less Depreciation	15%	0.00	186.72	158.71	134.91	114.67	97.47	82.85	70.42	59.86	50.88	43.25
Net Value		1244.82	1058.10	899.38	764.48	649.81	552.33	469.48	399.06	339.20	288.32	245.07
Mis fixed Assets		20.00	20.00	18.00	16.20	14.58	13.12	11.81	10.63	9.57	8.61	7.75
additions/deletions												
Total Gross value		20.00	20.00	18.00	16.20	14.58	13.12	11.81	10.63	9.57	8.61	7.75
less Depreciation	10%	0.00	2.00	1.80	1.62	1.46	1.31	1.18	1.06	0.96	0.86	0.77
Net Value of		20.00	18.00	16.20	14.58	13.12	11.81	10.63	9.57	8.61	7.75	6.97
pre operative expenses		20.00	20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68

additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		20.00	20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68
less Depreciation	20%	0.00	4.00	3.20	2.56	2.05	1.64	1.31	1.05	0.84	0.67	0.54
Net Value		20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68	2.15
provision for contingencies		62.24	62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11
additions/deletions												
Total Gross value		62.24	62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11
less Depreciation	10%	0.00	6.22	5.60	5.04	4.54	4.08	3.68	3.31	2.98	2.68	2.41
Net Value		62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11	21.70
TOTAL ASSETS & DEPRECIATION												
Gross value		**1467.06**	**1467.06**	**1256.12**	**1076.00**	**922.15**	**790.69**	**678.31**	**582.21**	**499.99**	**429.62**	**369.36**
additions/deletions		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Gross value		**1467.06**	**1467.06**	**1256.12**	**1076.00**	**922.15**	**790.69**	**678.31**	**582.21**	**499.99**	**429.62**	**369.36**
less Depreciation		**0.00**	**210.95**	**180.12**	**153.85**	**131.46**	**112.38**	**96.10**	**82.22**	**70.37**	**60.26**	**51.62**
Net Value		**1467.06**	**1256.12**	**1076.00**	**922.15**	**790.69**	**678.31**	**582.21**	**499.99**	**429.62**	**369.36**	**317.74**

11.10 Income Tax Calculation

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Profit as per Books			271.37	255.71	276.66	294.26	339.10	351.31	361.35	369.52	376.05	381.17
Add back depreciation as per books			199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
Depreciation as per Income Tax			210.95	180.12	153.85	131.46	112.38	96.10	82.22	70.37	60.26	51.62
Total Income			259.42	247.23	270.90	290.60	337.06	350.50	361.45	370.28	377.29	382.73
Corporate Tax @ 30%	15%		38.91	37.09	40.63	43.59	50.56	52.57	54.22	55.54	56.59	57.41

11.11 Internal Rate of Return-IRR

Rs. Lakhs	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10
Inflows											
Profit after Tax		232.45	218.63	236.03	250.67	288.55	298.74	307.13	313.97	319.46	323.76
Add Depreciation		199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
Add Interest		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Add Tax		38.91	37.09	40.63	43.59	50.56	52.57	54.22	55.54	56.59	57.41
Total Inflows		470.37	427.35	424.75	422.07	449.44	446.60	443.67	440.65	437.55	434.35
Out Flows											
Capital Expenditure	-1467.06										
Increase in working Capital		-63.99	0.32								
Total Outflows	-1467.06	-63.99	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Cash flows - Pre Tax	**-1467.06**	**406.38**	**427.67**	**424.75**	**422.07**	**449.44**	**446.60**	**443.67**	**440.65**	**437.55**	**434.35**
Project IRR	26%										
Net Cashflows Post Tax	**-1466.80**	**367.46**	**390.58**	**384.11**	**378.48**	**398.88**	**394.03**	**389.45**	**385.11**	**380.95**	**376.94**
Project IRR-Post Tax	23%										

11.12 NPV Calculation

		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Net Cash flows - pre tax		**-1467.06**	**406.38**	**427.67**	**424.75**	**422.07**	**449.44**	**446.60**	**443.67**	**440.65**	**437.55**	**434.35**
NPV FACTOR	26%		0.79	0.63	0.50	0.40	0.31	0.25	0.20	0.16	0.12	0.10
NET PRESENT VALUE -PRE TAX	0.26	1479.91	322.52	269.38	212.33	167.46	141.52	111.61	88.00	69.36	54.66	43.07
Net Cashflows Post Tax		**-1466.80**	**367.46**	**390.58**	**384.11**	**378.48**	**398.88**	**394.03**	**389.45**	**385.11**	**380.95**	**376.94**
NET PRESENT VAUE-POST TAX	23%		0.81	0.66	0.54	0.44	0.36	0.29	0.23	0.19	0.16	0.13
	0.23	1455.79	298.75	258.17	206.42	165.36	141.68	113.79	91.44	73.51	59.12	47.56

11.13 ROCE Calculation

		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Profit after tax			232.45	218.63	236.03	250.67	288.55	298.74	307.13	313.97	319.46	323.76
Capital Employed												
Net Fixed Assets			1268.06	1096.43	948.35	820.54	710.20	614.91	532.59	461.46	399.96	346.78
Net Working Capital			63.99	63.67	63.89	64.11	66.77	67.00	67.24	67.49	67.75	68.01
Total capital Employed			**1332.06**	**1160.10**	**1012.23**	**884.65**	**776.97**	**681.91**	**599.84**	**528.95**	**467.71**	**414.80**
ROCE			17%	19%	23%	28%	37%	44%	51%	59%	68%	78%
AVERAGE ROCE			35%									

11.14 Important Financial Ratios

		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
BREAK EVEN SALES			510.97	468.39	432.31	401.78	377.49	355.93	337.95	323.07	310.89	301.05
BREAK EVEN POINT			57%	52%	48%	45%	40%	37%	36%	34%	33%	32%
RETURN ON CAPITAL EMPLOYED												
NET FIXED ASSETS		1467.06	1268.06	1096.43	948.35	820.54	710.20	614.91	532.59	461.46	399.96	346.78
WORKING CAPITAL		0.00	63.99	63.67	63.89	64.11	66.77	67.00	67.24	67.49	67.75	68.01
TOAL CAPITAL EMPLOYED		1467.06	1332.06	1160.10	1012.23	884.65	776.97	681.91	599.84	528.95	467.71	414.80
NET PROFIT (PAIDT)			232.45	218.63	236.03	250.67	288.55	298.74	307.13	313.97	319.46	323.76
RETURN ON CAPITAL EMPLOYED			17%	18.8%	23%	28%	37%	44%	51%	59%	68%	78%
AVERAGE RETURN ON CAP EMP			35%									

Chapter 12

Project Financial Feasibility Analysis with 5% Sensitivity

12.1 Project Cost and Means of Finance

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Years		0	1	2	3	4	5	6	7	8	9	10
PROJECT COST												
Land & Buildings 15 years on lease		120.00	8.1%									
Plant and Machineries		1244.82	84.0%									
Miscl Fixed Assets		20.00	1.3%									
Pre operative expenses &Preliminary expenses		20.00	1.3%									
provision for Contingencies		62.24	4.2%									
Margin Money		15.50	1.0%									
TOTAL PROJECT COST		1482.56	100%									
SOURCES												
SPV	10%	148.26										
State Govt	10%	148.26										
GoI	80%	1186.05										
Bank Borrowings		0.00										
Total Project cost		1482.56										
GRANTS												
OPENING BALANCE		0.00	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56
GRANT		1482.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0 REPAYMENTS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CLOSING BALANCE OF TERM LOANS		1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56
INTEREST ON TERM LOANS BALANCE	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

12.2 Depreciation Calculation (WDV Method)

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Land & Site Development		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
less Depreciation	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Value		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Buildings		120.00	120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49
additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		120.00	120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49
less Depreciation	10%	0.00	12.00	10.80	9.72	8.75	7.87	7.09	6.38	5.74	5.17	4.65
Net Value		120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49	41.84
Plant & Machineries		1244.82	1244.82	1071.67	922.60	794.27	683.78	588.67	506.79	436.29	375.60	323.36
additions/deletions												
Total Gross value		1244.82	1244.82	1071.67	922.60	794.27	683.78	588.67	506.79	436.29	375.60	323.36
less Depreciation	14%	0.00	173.15	149.07	128.33	110.48	95.11	81.88	70.49	60.69	52.25	44.98
Net Value		1244.82	1071.67	922.60	794.27	683.78	588.67	506.79	436.29	375.60	323.36	278.38
Mis fixed Assets		20.00	20.00	16.38	13.42	10.99	9.00	7.37	6.04	4.94	4.05	3.32
additions/deletions												
Total Gross value		20.00	20.00	16.38	13.42	10.99	9.00	7.37	6.04	4.94	4.05	3.32
less Depreciation	18%	0.00	3.62	2.96	2.43	1.99	1.63	1.33	1.09	0.89	0.73	0.60
Net Value of		20.00	16.38	13.42	10.99	9.00	7.37	6.04	4.94	4.05	3.32	2.72
pre operative expenses		20.00	20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68

additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		20.00	20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68
less Depreciation	20%	0.00	4.00	3.20	2.56	2.05	1.64	1.31	1.05	0.84	0.67	0.54
Net Value		20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68	2.15
provision for contingencies		62.24	62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11
additions/deletions												
Total Gross value		62.24	62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11
less Depreciation	10%	0.00	6.22	5.60	5.04	4.54	4.08	3.68	3.31	2.98	2.68	2.41
Net Value		62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11	21.70
TOTAL ASSETS & DEPRECIATION												
Gross value		**1467.06**	**1467.06**	**1268.06**	**1096.43**	**948.35**	**820.54**	**710.20**	**614.91**	**532.59**	**461.46**	**399.96**
additions/deletions		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Gross value		**1467.06**	**1467.06**	**1268.06**	**1096.43**	**948.35**	**820.54**	**710.20**	**614.91**	**532.59**	**461.46**	**399.96**
less Depreciation		**0.00**	**199.00**	**171.64**	**148.08**	**127.80**	**110.34**	**95.29**	**82.32**	**71.14**	**61.50**	**53.18**
NET VALUE OF FIXED ASSETS		**1467.06**	**1268.06**	**1096.43**	**948.35**	**820.54**	**710.20**	**614.91**	**532.59**	**461.46**	**399.96**	**346.78**

12.3 Working Capital

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Raw Materials (Raw Materials)	1.10		37.12	37.12	37.12	37.12	38.54	38.54	38.54	38.54	38.54	38.54
Sundry Debtors (Revenues)	0.5		35.72	35.72	35.72	35.72	37.73	37.73	37.73	37.73	37.73	37.73
wages & salaries	1		6.95	7.16	7.38	7.60	7.83	8.06	8.30	8.55	8.81	9.07
Utilities	1		5.07	4.39	4.39	4.39	4.56	4.56	4.56	4.56	4.56	4.56
short Term loans and Advances(Rev)	0.25		17.86	17.86	17.86	17.86	18.86	18.86	18.86	18.86	18.86	18.86
Total Current Assets			102.72	102.25	102.47	102.69	107.52	107.75	107.99	108.24	108.50	108.76
Sundry Creditors(Materials)	1		22.86	22.86	22.86	22.86	24.15	24.15	24.15	24.15	24.15	24.15
Loans & Advances(Revenue)	0.25		17.86	17.86	17.86	17.86	18.86	18.86	18.86	18.86	18.86	18.86
Total Current Liabilities			40.72	40.72	40.72	40.72	43.01	43.01	43.01	43.01	43.01	43.01
Net Working Capital			62.00	61.53	61.75	61.97	64.51	64.74	64.98	65.23	65.49	65.75
Margin Money	25%		15.50	15.38	15.44	15.49	16.13	16.19	16.25	16.31	16.37	16.44
BALANCE W/C BANK FINANCE			46.50	46.15	46.31	46.48	48.38	48.56	48.74	48.92	49.12	49.31
INTEREST CALCULATION	15%		6.98	6.92	6.95	6.97	7.26	7.28	7.31	7.34	7.37	7.40

12.4 Capacity Utilization, Revenue Generation and Material Cost

			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
			0	1	2	3	4	5	6	7	8	9	10
Percentage utilisation			**100%**	**81%**	**81%**	**81%**	**81%**	**86%**	**86%**	**86%**	**86%**	**86%**	**86%**
Growth till full capacity													

PROJECTED REVENUE

Rs. Lakhs			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
REVENUE PROJECTIONS													
REVENUE			1017.00	821.23	821.23	821.23	821.23	869.54	869.54	869.54	869.54	869.54	869.54
TRAINING & RESEARCH			35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95
TOTAL REVENUE			1052.95	857.18	857.18	857.18	857.18	905.49	905.49	905.49	905.49	905.49	905.49
TOTAL REVENUE			**1052.95**	**857.18**	**857.18**	**857.18**	**857.18**	**905.49**	**905.49**	**905.49**	**905.49**	**905.49**	**905.49**
Growth %					**0%**	**0%**	**0%**	**6%**	**6%**	**0%**	**0%**	**0%**	

			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Rs. Lakhs			0	1	2	3	4	5	6	7	8	9	10
MATERIAL COST	%TO		100%										
	REVENUE												
MATERIAL COST	32%		150.60	274.30	274.30	274.30	274.30	289.76	289.76	289.76	289.76	289.76	289.76
TOTAL MATERIAL COST			**150.60**	**274.30**	**274.30**	**274.30**	**274.30**	**289.76**	**289.76**	**289.76**	**289.76**	**289.76**	**289.76**
OTHER INDIRECT MATLS	0%		0.53	0.43	0.43	0.43	0.43	0.45	0.45	0.45	0.45	0.45	0.45
TOTAL MATERIAL COST			**151.13**	**274.73**	**274.73**	**274.73**	**274.73**	**290.21**	**290.21**	**290.21**	**290.21**	**290.21**	**290.21**
TOTAL MATERIAL COST AS % REVENUE				**32%**	**32%**	**32%**	**32%**	**32%**	**32%**	**32%**	**32%**	**32%**	**32%**

12.5 Breakeven Analysis

			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Rs. Lakhs			0	1	2	3	4	5	6	7	8	9	10
VARIALBE EXPENSES	1												
Direct Materials	**14%**		**151.13**	**274.73**	**274.73**	**274.73**	**274.73**	**290.21**	**290.21**	**290.21**	**290.21**	**290.21**	**290.21**
Fuel cost	1%		10.53	8.57	8.57	8.57	8.57	9.05	9.05	9.05	9.05	9.05	9.05
Direct wages	3%	3%	23.88	24.60	25.33	26.09	26.88	27.68	28.51	29.37	30.25	31.16	32.09
power	4%		43.68	35.56	35.56	35.56	35.56	37.56	37.56	37.56	37.56	37.56	37.56
Interest on Working Capital				6.98	6.92	6.95	6.97	7.26	7.28	7.31	7.34	7.37	7.40
TOTAL VARIABLE EXPENSES				**350.43**	**351.11**	**351.90**	**352.70**	**371.77**	**372.62**	**373.51**	**374.41**	**375.35**	**376.32**
TOTAL CONTRIBUTION (Rev-Variable cost)				**506.75**	**506.06**	**505.28**	**504.47**	**533.72**	**532.86**	**531.98**	**531.07**	**530.13**	**529.17**
FIXED EXPENSES	1		FBS										
Salaries & wages	7%	3%	57.12	58.83	60.60	62.42	64.29	66.22	68.20	70.25	72.36	74.53	76.76
Power fixed	2.00%			17.14	17.14	17.14	17.14	17.14	17.14	17.14	17.14	17.14	17.14
Administration & Sales Expenses	1.5%			12.86	12.86	12.86	12.86	13.58	13.58	13.58	13.58	13.58	13.58
Repair and maintenance	1.5%			12.86	12.86	12.86	12.86	13.58	13.58	13.58	13.58	13.58	13.58
Interest on Term Loans				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation				199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
TOTAL FIXED EXPENSES				**300.69**	**275.09**	**253.36**	**234.95**	**220.86**	**207.80**	**196.88**	**187.80**	**180.33**	**174.25**
BREAKEVENREVENUE				508.63	465.96	429.81	399.22	374.71	353.11	335.11	320.21	308.01	298.16
BREAKEVEN POINT(43%)				**59%**	**54%**	**50%**	**47%**	**41%**	**39%**	**37%**	**35%**	**34%**	**33%**

12.6 Projected Profit and Loss

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
VALUE ADDED			**857.18**	**857.18**	**857.18**	**857.18**	**905.49**	**905.49**	**905.49**	**905.49**	**905.49**	**905.49**
MATERIAL COST-INDIRECT	32%		274.73	274.73	274.73	274.73	290.21	290.21	290.21	290.21	290.21	290.21
FUEL COST	1%		**8.57**	**8.57**	**8.57**	**8.57**	**9.05**	**9.05**	**9.05**	**9.05**	**9.05**	**9.05**
EXPENSES												
WAGES	3%		24.60	25.33	26.09	26.88	27.68	28.51	29.37	30.25	31.16	32.09
SALARIES	7%		58.83	60.60	62.42	64.29	66.22	68.20	70.25	72.36	74.53	76.76
POWER	10%		14.81	52.70	52.70	52.70	54.71	54.71	54.71	54.71	54.71	54.71
REPAIR & MAINTENANCE	2%		12.86	12.86	12.86	12.86	13.58	13.58	13.58	13.58	13.58	13.58
ADMINISTRATION & SELLING EXPENSES	2%		12.86	12.86	12.86	12.86	13.58	13.58	13.58	13.58	13.58	13.58
TOTAL EXPENSES	48%		**407.25**	**447.65**	**450.23**	**452.88**	**475.03**	**477.85**	**480.75**	**483.74**	**486.82**	**489.99**
OPERATING PROFIT(PBIDT)	52%		**449.93**	**409.53**	**406.95**	**404.30**	**430.45**	**427.63**	**424.73**	**421.74**	**418.66**	**415.49**
INTEREST WORKING CAPITAL	1%		**6.98**	**6.92**	**6.95**	**6.97**	**7.26**	**7.28**	**7.31**	**7.34**	**7.37**	**7.40**
PBDT	52%		**442.95**	**402.61**	**400.01**	**397.32**	**423.19**	**420.35**	**417.42**	**414.40**	**411.30**	**408.10**
DEPRECIATION	23%		199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
NET PROFIT BEORE TAX	28%		**243.95**	**230.97**	**251.92**	**269.52**	**312.86**	**325.06**	**335.10**	**343.27**	**349.80**	**354.92**
INCOME TAX	4%		34.80	33.37	36.92	39.88	46.62	48.64	50.28	51.60	52.66	53.47
NET PROFIT AFTER TAX	24%		**209.15**	**197.60**	**215.00**	**229.64**	**266.23**	**276.42**	**284.82**	**291.66**	**297.15**	**301.45**
NET PROFIT AS % TO NET REVENUE	0%		**24%**	**23%**	**25%**	**27%**	**29%**	**31%**	**31%**	**32%**	**33%**	**33%**
AVERAGE NET PROFIT TO REVENUE			**28.9%**									
CUMULATIVE PROFIT & LOSS			**209.15**	**406.75**	**621.75**	**851.39**	**1117.62**	**1394.04**	**1678.87**	**1970.53**	**2267.67**	**2569.12**

12.7 Cash Flow Statement

Rs. Lakhs	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10
SOURCES											
NET PROFIT BEORE TAX	0.00	243.95	230.97	251.92	269.52	312.86	325.06	335.10	343.27	349.80	354.92
Term Loans											
Govt. Grant	1482.56										
Promoters Contribution											
Increase in Bank borrowing		46.50	-0.35	0.16	0.17	1.90	0.18	0.18	0.19	0.19	0.20
Depreciation		199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
Others											
TOTAL SOURCES	**1482.56**	**489.45**	**402.26**	**400.17**	**397.49**	**425.10**	**420.53**	**417.60**	**414.59**	**411.49**	**408.30**
DISPOSAL OF FUNDS											
Preliminary expenses											
Capital Expenditure	1467.06										
Increase in Working Capital		62.00	-0.47	0.21	0.22	2.54	0.23	0.24	0.25	0.26	0.26
Decrease in Term Loans		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Income Tax		34.80	33.37	36.92	39.88	46.62	48.64	50.28	51.60	52.66	53.47
Others											
TOTAL DISPOSAL OF FUNDS	**1467.06**	**96.80**	**32.91**	**37.14**	**40.10**	**49.16**	**48.87**	**50.52**	**51.85**	**52.91**	**53.74**
Opening cash balance	0.00	15.50	408.15	777.50	1140.53	1497.92	1873.86	2245.51	2612.59	2975.33	3333.90
Surplus/Deficit	15.50	392.65	369.35	363.03	357.39	375.94	371.65	367.08	362.74	358.58	354.56
Closing Cash Balance	**15.50**	**408.15**	**777.50**	**1140.53**	**1497.92**	**1873.86**	**2245.51**	**2612.59**	**2975.33**	**3333.90**	**3688.46**

12.8 Projected Balance Sheet

Rs. Lakhs	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10
ASSETS											
Gross Fixed Assets	1467.06	1467.06	1268.06	1096.43	948.35	820.54	710.20	614.91	532.59	461.46	399.96
less depreciation	0.00	199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
Net Fixed Assets	1467.06	1268.06	1096.43	948.35	820.54	710.20	614.91	532.59	461.46	399.96	346.78
Total Current Assets	0.00	102.72	102.25	102.47	102.69	107.52	107.75	107.99	108.24	108.50	108.76
Cash/Bank Balance	15.50	408.15	777.50	1140.53	1497.92	1873.86	2245.51	2612.59	2975.33	3333.90	3688.46
TOTAL ASSETS	**1482.56**	**1778.93**	**1976.18**	**2191.34**	**2421.15**	**2691.58**	**2968.18**	**3253.18**	**3545.03**	**3842.36**	**4144.01**
LIABILITIES											
RESERVES & SURPLUSES											
Govt. Grant	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56	1482.56
profit/Loss	0.00	209.15	406.75	621.75	851.39	1117.62	1394.04	1678.87	1970.53	2267.67	2569.12
TOTAL RESERVES & SURPLUSES	**1482.56**	**1691.72**	**1889.31**	**2104.31**	**2333.95**	**2600.19**	**2876.61**	**3161.43**	**3453.09**	**3750.24**	**4051.69**
Current Liabilities	0.00	40.72	40.72	40.72	40.72	43.01	43.01	43.01	43.01	43.01	43.01
Short Term Loans	0.00	46.50	46.15	46.31	46.48	48.38	48.56	48.74	48.92	49.12	49.31
TOTAL LIABILITIES	**1482.56**	**1778.93**	**1976.18**	**2191.34**	**2421.15**	**2691.58**	**2968.18**	**3253.18**	**3545.03**	**3842.36**	**4144.01**

12.9 Depreciation Calculation – Income Tax Method

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Land & Site Development		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
less Depreciation	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Value		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Buildings		120.00	120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49
additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		120.00	120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49
less Depreciation	10%	0.00	12.00	10.80	9.72	8.75	7.87	7.09	6.38	5.74	5.17	4.65
Net Value		120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49	41.84
Plant & Machineries		1244.82	1244.82	1058.10	899.38	764.48	649.81	552.33	469.48	399.06	339.20	288.32
additions/deletions												
Total Gross value		1244.82	1244.82	1058.10	899.38	764.48	649.81	552.33	469.48	399.06	339.20	288.32
less Depreciation	15%	0.00	186.72	158.71	134.91	114.67	97.47	82.85	70.42	59.86	50.88	43.25
Net Value		1244.82	1058.10	899.38	764.48	649.81	552.33	469.48	399.06	339.20	288.32	245.07
Mis fixed Assets		20.00	20.00	18.00	16.20	14.58	13.12	11.81	10.63	9.57	8.61	7.75
additions/deletions												
Total Gross value		20.00	20.00	18.00	16.20	14.58	13.12	11.81	10.63	9.57	8.61	7.75
less Depreciation	10%	0.00	2.00	1.80	1.62	1.46	1.31	1.18	1.06	0.96	0.86	0.77
Net Value of		20.00	18.00	16.20	14.58	13.12	11.81	10.63	9.57	8.61	7.75	6.97
pre operative expenses		20.00	20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68

additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		20.00	20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68
less Depreciation	20%	0.00	4.00	3.20	2.56	2.05	1.64	1.31	1.05	0.84	0.67	0.54
Net Value		20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68	2.15
provision for contingencies		62.24	62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11
additions/deletions												
Total Gross value		62.24	62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11
less Depreciation	10%	0.00	6.22	5.60	5.04	4.54	4.08	3.68	3.31	2.98	2.68	2.41
Net Value		62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11	21.70
TOTAL ASSETS & DEPRECIATION												
Gross value		**1467.06**	**1467.06**	**1256.12**	**1076.00**	**922.15**	**790.69**	**678.31**	**582.21**	**499.99**	**429.62**	**369.36**
additions/deletions		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Gross value		**1467.06**	**1467.06**	**1256.12**	**1076.00**	**922.15**	**790.69**	**678.31**	**582.21**	**499.99**	**429.62**	**369.36**
less Depreciation		**0.00**	**210.95**	**180.12**	**153.85**	**131.46**	**112.38**	**96.10**	**82.22**	**70.37**	**60.26**	**51.62**
Net Value		**1467.06**	**1256.12**	**1076.00**	**922.15**	**790.69**	**678.31**	**582.21**	**499.99**	**429.62**	**369.36**	**317.74**

12.10 Income Tax Calculation

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Profit as per Books			243.95	230.97	251.92	269.52	312.86	325.06	335.10	343.27	349.80	354.92
Add back depreciation as per books			199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
Depreciation as per Income Tax			210.95	180.12	153.85	131.46	112.38	96.10	82.22	70.37	60.26	51.62
Total Income			232.00	222.49	246.16	265.86	310.82	324.25	335.20	344.03	351.04	356.48
Corporate Tax @ 30%	15%		34.80	33.37	36.92	39.88	46.62	48.64	50.28	51.60	52.66	53.47

12.11 Internal Rate of Return-IRR

Rs. Lakhs	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10
Inflows											
Profit after Tax		209.15	197.60	215.00	229.64	266.23	276.42	284.82	291.66	297.15	301.45
Add Depreciation		199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
Add Interest		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Add Tax		34.80	33.37	36.92	39.88	46.62	48.64	50.28	51.60	52.66	53.47
Total Inflows		442.95	402.61	400.01	397.32	423.19	420.35	417.42	414.40	411.30	408.10
Out Flows											
Capital Expenditure	-1467.06										
Increase in working Capital		-62.00	0.47								
Total Outflows	-1467.06	-62.00	0.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Cash flows - Pre Tax	**-1467.06**	**380.95**	**403.08**	**400.01**	**397.32**	**423.19**	**420.35**	**417.42**	**414.40**	**411.30**	**408.10**
Project IRR	24%										
Net Cashflows Post Tax	**-1466.82**	**346.15**	**369.70**	**363.08**	**357.45**	**376.57**	**371.71**	**367.14**	**362.80**	**358.64**	**354.63**
Project IRR-Post Tax	21%										

12.12 NPV Calculation

		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Net Cash flows - pre tax		**-1467.06**	**380.95**	**403.08**	**400.01**	**397.32**	**423.19**	**420.35**	**417.42**	**414.40**	**411.30**	**408.10**
NPV FACTOR	24%		0.81	0.65	0.52	0.42	0.34	0.28	0.22	0.18	0.14	0.12
NET PRESENT VALUE -PRE TAX	0.24	1480.77	307.22	262.15	209.80	168.06	144.35	115.63	92.60	74.14	59.34	47.48
Net Cashflows Post Tax		**-1466.82**	**346.15**	**369.70**	**363.08**	**357.45**	**376.57**	**371.71**	**367.14**	**362.80**	**358.64**	**354.63**
NET PRESENT VAUE-POST TAX	21%		0.83	0.68	0.56	0.47	0.39	0.32	0.26	0.22	0.18	0.15
	0.21	1466.76	286.07	252.51	204.95	166.75	145.18	118.44	96.68	78.96	64.50	52.71

12.13 ROCE Calculation

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10
Profit after tax		209.15	197.60	215.00	229.64	266.23	276.42	284.82	291.66	297.15	301.45
Capital Employed											
Net Fixed Assets		1268.06	1096.43	948.35	820.54	710.20	614.91	532.59	461.46	399.96	346.78
Net Working Capital		62.00	61.53	61.75	61.97	64.51	64.74	64.98	65.23	65.49	65.75
Total capital Employed		**1330.07**	**1157.96**	**1010.10**	**882.51**	**774.71**	**679.66**	**597.58**	**526.69**	**465.45**	**412.54**
ROCE		16%	17%	21%	26%	34%	41%	48%	55%	64%	73%
AVERAGE ROCE		33%									

12.14 Important Financial Ratios

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10
BREAK EVEN SALES		508.63	465.96	429.81	399.22	374.71	353.11	335.11	320.21	308.01	298.16
BREAK EVEN POINT		59%	54%	50%	47%	41%	39%	37%	35%	34%	33%
RETURN ON CAPITAL EMPLOYED											
NET FIXED ASSETS	1467.06	1268.06	1096.43	948.35	820.54	710.20	614.91	532.59	461.46	399.96	346.78
WORKING CAPITAL	0.00	62.00	61.53	61.75	61.97	64.51	64.74	64.98	65.23	65.49	65.75
TOAL CAPITAL EMPLOYED	1467.06	1330.07	1157.96	1010.10	882.51	774.71	679.66	597.58	526.69	465.45	412.54
NET PROFIT (PAIDT)		209.15	197.60	215.00	229.64	266.23	276.42	284.82	291.66	297.15	301.45
RETURN ON CAPITAL EMPLOYED		16%	17.1%	21%	26%	34%	41%	48%	55%	64%	73%
AVERAGE RETURN ON CAP EMP		33%									

Chapter 13

Project Financial Feasibility Analysis with 10% Sensitivity

13.1 Project Cost and Means of Finance

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Years		0	1	2	3	4	5	6	7	8	9	10
PROJECT COST												
Land & Buildings 15 years on lease		120.00	8.1%									
Plant and Machineries		1244.82	84.0%									
Miscl Fixed Assets		20.00	1.3%									
Pre operative expenses &Preliminary expenses		20.00	1.3%									
provision for Contingencies		62.24	4.2%									
Margin Money		15.00	1.0%									
TOTAL PROJECT COST		1482.07	100%									
SOURCES												
SPV	10%	148.21										
State Govt	10%	148.21										
GoI	80%	1185.65										
Bank Borrowings		0.00										
Total Project cost		1482.07										
GRANTS												
OPENING BALANCE		0.00	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07
GRANT		1482.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0 REPAYMENTS	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CLOSING BALANCE OF TERM LOANS		1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07
INTEREST ON TERM LOANS BALANCE	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

13.2 Depreciation Calculation (WDV Method)

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Land & Site Development		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
less Depreciation	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Value		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Buildings		120.00	120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49
additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		120.00	120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49
less Depreciation	10%	0.00	12.00	10.80	9.72	8.75	7.87	7.09	6.38	5.74	5.17	4.65
Net Value		120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49	41.84
Plant & Machineries		1244.82	1244.82	1071.67	922.60	794.27	683.78	588.67	506.79	436.29	375.60	323.36
additions/deletions												
Total Gross value		1244.82	1244.82	1071.67	922.60	794.27	683.78	588.67	506.79	436.29	375.60	323.36
less Depreciation	14%	0.00	173.15	149.07	128.33	110.48	95.11	81.88	70.49	60.69	52.25	44.98
Net Value		1244.82	1071.67	922.60	794.27	683.78	588.67	506.79	436.29	375.60	323.36	278.38
Mis fixed Assets		20.00	20.00	16.38	13.42	10.99	9.00	7.37	6.04	4.94	4.05	3.32
additions/deletions												
Total Gross value		20.00	20.00	16.38	13.42	10.99	9.00	7.37	6.04	4.94	4.05	3.32
less Depreciation	18%	0.00	3.62	2.96	2.43	1.99	1.63	1.33	1.09	0.89	0.73	0.60
Net Value of		20.00	16.38	13.42	10.99	9.00	7.37	6.04	4.94	4.05	3.32	2.72
pre operative expenses		20.00	20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68

additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		20.00	20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68
less Depreciation	20%	0.00	4.00	3.20	2.56	2.05	1.64	1.31	1.05	0.84	0.67	0.54
Net Value		20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68	2.15
provision for contingencies		62.24	62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11
additions/deletions												
Total Gross value		62.24	62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11
less Depreciation	10%	0.00	6.22	5.60	5.04	4.54	4.08	3.68	3.31	2.98	2.68	2.41
Net Value		62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11	21.70
TOTAL ASSETS & DEPRECIATION												
Gross value		**1467.06**	**1467.06**	**1268.06**	**1096.43**	**948.35**	**820.54**	**710.20**	**614.91**	**532.59**	**461.46**	**399.96**
additions/deletions		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Gross value		**1467.06**	**1467.06**	**1268.06**	**1096.43**	**948.35**	**820.54**	**710.20**	**614.91**	**532.59**	**461.46**	**399.96**
less Depreciation		**0.00**	**199.00**	**171.64**	**148.08**	**127.80**	**110.34**	**95.29**	**82.32**	**71.14**	**61.50**	**53.18**
NET VALUE OF FIXED ASSETS		**1467.06**	**1268.06**	**1096.43**	**948.35**	**820.54**	**710.20**	**614.91**	**532.59**	**461.46**	**399.96**	**346.78**

13.3 Working Capital

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Raw Materials (Raw Materials)	1.10		35.86	35.86	35.86	35.86	37.20	37.20	37.20	37.20	37.20	37.20
Sundry Debtors (Revenues)	0.5		33.91	33.91	33.91	33.91	35.82	35.82	35.82	35.82	35.82	35.82
wages & salaries	1		6.95	7.16	7.38	7.60	7.83	8.06	8.30	8.55	8.81	9.07
Utilities	1		5.00	4.17	4.17	4.17	4.33	4.33	4.33	4.33	4.33	4.33
short Term loans and Advances(Rev)	0.25		16.96	16.96	16.96	16.96	17.91	17.91	17.91	17.91	17.91	17.91
Total Current Assets			98.68	98.06	98.27	98.50	103.08	103.32	103.56	103.81	104.07	104.33
Sundry Creditors(Materials)	1		21.71	21.71	21.71	21.71	22.93	22.93	22.93	22.93	22.93	22.93
Loans & Advances(Revenue)	0.25		16.96	16.96	16.96	16.96	17.91	17.91	17.91	17.91	17.91	17.91
Total Current Liabilities			38.66	38.66	38.66	38.66	40.84	40.84	40.84	40.84	40.84	40.84
Net Working Capital			60.01	59.40	59.61	59.83	62.25	62.48	62.72	62.97	63.23	63.49
Margin Money	25%		15.00	14.85	14.90	14.96	15.56	15.62	15.68	15.74	15.81	15.87
BALANCE W/C BANK FINANCE			45.01	44.55	44.71	44.87	46.69	46.86	47.04	47.23	47.42	47.62
INTEREST CALCULATION	15%		6.75	6.68	6.71	6.73	7.00	7.03	7.06	7.08	7.11	7.14

13.4 Capacity Utilization, Revenue Generation and Material Cost

			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
			0	1	2	3	4	5	6	7	8	9	10
Percentage utilisation	0.9		100%	77%	77%	77%	77%	81%	81%	81%	81%	81%	81%
Growth till full capacity													

PROJECTED REVENUE

Rs. Lakhs			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
REVENUE PROJECTIONS													
REVENUE			1017.00	778.01	778.01	778.01	778.01	823.77	823.77	823.77	823.77	823.77	823.77
TRAINING & RESEARCH			35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95	35.95
TOTAL REVENUE			1052.95	813.96	813.96	813.96	813.96	859.72	859.72	859.72	859.72	859.72	859.72
TOTAL REVENUE			**1052.95**	**813.96**	**813.96**	**813.96**	**813.96**	**859.72**	**859.72**	**859.72**	**859.72**	**859.72**	**859.72**
Growth %					0%	0%	0%	6%	6%	0%	0%	0%	

			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Rs. Lakhs			0	1	2	3	4	5	6	7	8	9	10
MATERIAL COST	%TO		100%										
	REVENUE												
MATERIAL COST	32%		150.60	260.47	260.47	260.47	260.47	275.11	275.11	275.11	275.11	275.11	275.11
TOTAL MATERIAL COST			**150.60**	**260.47**	**260.47**	**260.47**	**260.47**	**275.11**	**275.11**	**275.11**	**275.11**	**275.11**	**275.11**
OTHER INDIRECT MATLS	0%		0.53	0.41	0.41	0.41	0.41	0.43	0.43	0.43	0.43	0.43	0.43
TOTAL MATERIAL COST			**151.13**	**260.87**	**260.87**	**260.87**	**260.87**	**275.54**	**275.54**	**275.54**	**275.54**	**275.54**	**275.54**
TOTAL MATERIAL COST AS % REVENUE				**32%**	**32%**	**32%**	**32%**	**32%**	**32%**	**32%**	**32%**	**32%**	**32%**

13.5 Breakeven Analysis

			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Rs. Lakhs			0	1	2	3	4	5	6	7	8	9	10
VARIALBE EXPENSES	1												
Direct Materials	14%		151.13	260.87	260.87	260.87	260.87	275.54	275.54	275.54	275.54	275.54	275.54
Fuel cost	1%		10.53	8.14	8.14	8.14	8.14	8.60	8.60	8.60	8.60	8.60	8.60
Direct wages	3%	3%	23.88	24.60	25.33	26.09	26.88	27.68	28.51	29.37	30.25	31.16	32.09
power	4%		43.68	33.77	33.77	33.77	33.77	35.66	35.66	35.66	35.66	35.66	35.66
Interest on Working Capital				6.75	6.68	6.71	6.73	7.00	7.03	7.06	7.08	7.11	7.14
TOTAL VARIABLE EXPENSES				**334.13**	**334.79**	**335.58**	**336.39**	**354.49**	**355.34**	**356.23**	**357.14**	**358.07**	**359.04**
TOTAL CONTRIBUTION(Rev-Variable cost)				**479.83**	**479.16**	**478.38**	**477.57**	**505.23**	**504.38**	**503.49**	**502.58**	**501.65**	**500.68**
FIXED EXPENSES	1		FBS										
Salaries & wages	7%	3%	57.12	58.83	60.60	62.42	64.29	66.22	68.20	70.25	72.36	74.53	76.76
Power fixed	2.00%			16.28	16.28	16.28	16.28	16.28	16.28	16.28	16.28	16.28	16.28
Administration & Sales Expenses	1.5%			12.21	12.21	12.21	12.21	12.90	12.90	12.90	12.90	12.90	12.90
Repair and maintanence	1.5%			12.21	12.21	12.21	12.21	12.90	12.90	12.90	12.90	12.90	12.90
Interest on Term Loans				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depreciation				199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
TOTAL FIXED EXPENSES				**298.53**	**272.93**	**251.20**	**232.79**	**218.63**	**205.56**	**194.64**	**185.57**	**178.09**	**172.01**
BREAKEVENREVENUE				506.41	463.63	427.41	396.76	372.02	350.39	332.35	317.43	305.22	295.36
BREAKEVEN POINT(45%)				**62%**	**57%**	**53%**	**49%**	**43%**	**41%**	**39%**	**37%**	**36%**	**34%**

13.6 Projected Profit and Loss

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
VALUE ADDED			**813.96**	**813.96**	**813.96**	**813.96**	**859.72**	**859.72**	**859.72**	**859.72**	**859.72**	**859.72**
MATERIAL COST-INDIRECT	32%		260.87	260.87	260.87	260.87	275.54	275.54	275.54	275.54	275.54	275.54
FUEL COST	1%		**8.14**	**8.14**	**8.14**	**8.14**	**8.60**	**8.60**	**8.60**	**8.60**	**8.60**	**8.60**
EXPENSES												
WAGES	3%		24.60	25.33	26.09	26.88	27.68	28.51	29.37	30.25	31.16	32.09
SALARIES	7%		58.83	60.60	62.42	64.29	66.22	68.20	70.25	72.36	74.53	76.76
POWER	10%		14.81	50.04	50.04	50.04	51.94	51.94	51.94	51.94	51.94	51.94
REPAIR & MAINTENANCE	2%		12.21	12.21	12.21	12.21	12.90	12.90	12.90	12.90	12.90	12.90
ADMINISTRATION & SELLING EXPENSES	2%		12.21	12.21	12.21	12.21	12.90	12.90	12.90	12.90	12.90	12.90
TOTAL EXPENSES	48%		**391.67**	**429.41**	**431.99**	**434.64**	**455.77**	**458.59**	**461.49**	**464.48**	**467.56**	**470.73**
OPERATING PROFIT(PBIDT)	52%		**422.28**	**384.55**	**381.97**	**379.31**	**403.95**	**401.13**	**398.23**	**395.24**	**392.16**	**388.99**
INTEREST WORKING CAPITAL	1%		**6.75**	**6.68**	**6.71**	**6.73**	**7.00**	**7.03**	**7.06**	**7.08**	**7.11**	**7.14**
PBDT	51%		**415.53**	**377.86**	**375.26**	**372.58**	**396.94**	**394.10**	**391.17**	**388.15**	**385.05**	**381.85**
DEPRECIATION	24%		199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
NET PROFIT BEORE TAX	27%		**216.53**	**206.23**	**227.18**	**244.78**	**286.61**	**298.81**	**308.85**	**317.02**	**323.55**	**328.67**
INCOME TAX	4%		30.69	29.66	33.21	36.17	42.68	44.70	46.34	47.67	48.72	49.53
NET PROFIT AFTER TAX	23%		**185.85**	**176.57**	**193.97**	**208.61**	**243.92**	**254.11**	**262.51**	**269.35**	**274.83**	**279.14**
NET PROFIT AS % TO NET REVENUE	0%		**23%**	**22%**	**24%**	**26%**	**28%**	**30%**	**31%**	**31%**	**32%**	**32%**
AVERAGE NET PROFIT TO REVENUE			**27.8%**									
CUMULATIVE PROFIT & LOSS			**185.85**	**362.41**	**556.38**	**764.99**	**1008.91**	**1263.02**	**1525.53**	**1794.88**	**2069.71**	**2348.85**

13.7 Cash Flow Statement

Rs. Lakhs	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10
SOURCES											
NET PROFIT BEORE TAX	0.00	216.53	206.23	227.18	244.78	286.61	298.81	308.85	317.02	323.55	328.67
Term Loans											
Govt. Grant	1482.07										
Promoters Contribution											
Increase in Bank borrowing		45.01	-0.46	0.16	0.17	1.81	0.18	0.18	0.19	0.19	0.20
Depreciation		199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
Others											
TOTAL SOURCES	**1482.07**	**460.54**	**377.40**	**375.42**	**372.75**	**398.75**	**394.28**	**391.35**	**388.34**	**385.24**	**382.05**
DISPOSAL OF FUNDS											
Preliminary expenses											
Capital Expenditure	1467.06										
Increase in Working Capital		60.01	-0.62	0.21	0.22	2.41	0.23	0.24	0.25	0.26	0.26
Decrease in Term Loans		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Income Tax		30.69	29.66	33.21	36.17	42.68	44.70	46.34	47.67	48.72	49.53
others											
TOTAL DISPOSAL OF FUNDS	**1467.06**	**90.70**	**29.04**	**33.43**	**36.39**	**45.10**	**44.93**	**46.58**	**47.92**	**48.98**	**49.80**
Opening cash balance	0.00	15.00	384.84	733.20	1075.20	1411.56	1765.21	2114.55	2459.32	2799.75	3136.01
Surplus/Deficit	15.00	369.84	348.36	342.00	336.36	353.66	349.34	344.77	340.42	336.26	332.25
Closing Cash Balance	**15.00**	**384.84**	**733.20**	**1075.20**	**1411.56**	**1765.21**	**2114.55**	**2459.32**	**2799.75**	**3136.01**	**3468.26**

13.8 Projected Balance Sheet

Rs. Lakhs	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10
ASSETS											
Gross Fixed Assets	1467.06	1467.06	1268.06	1096.43	948.35	820.54	710.20	614.91	532.59	461.46	399.96
less depreciation	0.00	199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
Net Fixed Assets	1467.06	1268.06	1096.43	948.35	820.54	710.20	614.91	532.59	461.46	399.96	346.78
Total Current Assets	0.00	98.68	98.06	98.27	98.50	103.08	103.32	103.56	103.81	104.07	104.33
Cash/Bank Balance	15.00	384.84	733.20	1075.20	1411.56	1765.21	2114.55	2459.32	2799.75	3136.01	3468.26
TOTAL ASSETS	**1482.07**	**1751.59**	**1927.69**	**2121.82**	**2330.59**	**2578.50**	**2832.79**	**3095.48**	**3365.01**	**3640.04**	**3919.37**
LIABILITIES											
RESERVES & SURPLUSES											
Govt. Grant	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07	1482.07
profit/Loss	0.00	185.85	362.41	556.38	764.99	1008.91	1263.02	1525.53	1794.88	2069.71	2348.85
TOTAL RESERVES & SURPLUSES	**1482.07**	**1667.91**	**1844.48**	**2038.45**	**2247.06**	**2490.98**	**2745.09**	**3007.60**	**3276.95**	**3551.78**	**3830.92**
Current Liabilities	0.00	38.66	38.66	38.66	38.66	40.84	40.84	40.84	40.84	40.84	40.84
Short Term Loans	0.00	45.01	44.55	44.71	44.87	46.69	46.86	47.04	47.23	47.42	47.62
TOTAL LIABILITIES	**1482.07**	**1751.59**	**1927.69**	**2121.82**	**2330.59**	**2578.50**	**2832.79**	**3095.48**	**3365.01**	**3640.04**	**3919.37**

13.9 Depreciation Calculation – (Income Tax Method)

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Land & Site Development		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
less Depreciation	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Value		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Buildings		120.00	120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49
additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		120.00	120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49
less Depreciation	10%	0.00	12.00	10.80	9.72	8.75	7.87	7.09	6.38	5.74	5.17	4.65
Net Value		120.00	108.00	97.20	87.48	78.73	70.86	63.77	57.40	51.66	46.49	41.84
Plant & Machineries		1244.82	1244.82	1058.10	899.38	764.48	649.81	552.33	469.48	399.06	339.20	288.32
additions/deletions												
Total Gross value		1244.82	1244.82	1058.10	899.38	764.48	649.81	552.33	469.48	399.06	339.20	288.32
less Depreciation	15%	0.00	186.72	158.71	134.91	114.67	97.47	82.85	70.42	59.86	50.88	43.25
Net Value		1244.82	1058.10	899.38	764.48	649.81	552.33	469.48	399.06	339.20	288.32	245.07
Mis fixed Assets		20.00	20.00	18.00	16.20	14.58	13.12	11.81	10.63	9.57	8.61	7.75
additions/deletions												
Total Gross value		20.00	20.00	18.00	16.20	14.58	13.12	11.81	10.63	9.57	8.61	7.75
less Depreciation	10%	0.00	2.00	1.80	1.62	1.46	1.31	1.18	1.06	0.96	0.86	0.77
Net Value of		20.00	18.00	16.20	14.58	13.12	11.81	10.63	9.57	8.61	7.75	6.97
pre operative expenses		20.00	20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68

additions/deletions		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Gross value		20.00	20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68
less Depreciation	20%	0.00	4.00	3.20	2.56	2.05	1.64	1.31	1.05	0.84	0.67	0.54
Net Value		20.00	16.00	12.80	10.24	8.19	6.55	5.24	4.19	3.36	2.68	2.15
provision for contingencies		62.24	62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11
additions/deletions												
Total Gross value		62.24	62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11
less Depreciation	10%	0.00	6.22	5.60	5.04	4.54	4.08	3.68	3.31	2.98	2.68	2.41
Net Value		62.24	56.02	50.42	45.37	40.84	36.75	33.08	29.77	26.79	24.11	21.70
TOTAL ASSETS & DEPRECIATION												
Gross value		**1467.06**	**1467.06**	**1256.12**	**1076.00**	**922.15**	**790.69**	**678.31**	**582.21**	**499.99**	**429.62**	**369.36**
additions/deletions		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Gross value		**1467.06**	**1467.06**	**1256.12**	**1076.00**	**922.15**	**790.69**	**678.31**	**582.21**	**499.99**	**429.62**	**369.36**
less Depreciation		**0.00**	**210.95**	**180.12**	**153.85**	**131.46**	**112.38**	**96.10**	**82.22**	**70.37**	**60.26**	**51.62**
Net Value		**1467.06**	**1256.12**	**1076.00**	**922.15**	**790.69**	**678.31**	**582.21**	**499.99**	**429.62**	**369.36**	**317.74**

13.10 Income Tax Calculation

Rs. Lakhs		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Profit as per Books			216.53	206.23	227.18	244.78	286.61	298.81	308.85	317.02	323.55	328.67
Add back depreciation as per books			199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
Depreciation as per Income Tax			210.95	180.12	153.85	131.46	112.38	96.10	82.22	70.37	60.26	51.62
Total Income			204.59	197.75	221.41	241.12	284.57	298.00	308.95	317.78	324.79	330.23
Corporate Tax @ 30%	15%		30.69	29.66	33.21	36.17	42.68	44.70	46.34	47.67	48.72	49.53

13.11 Internal Rate of Return-IRR

Rs. Lakhs	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10
Inflows											
Profit after Tax		185.85	176.57	193.97	208.61	243.92	254.11	262.51	269.35	274.83	279.14
Add Depreciation		199.00	171.64	148.08	127.80	110.34	95.29	82.32	71.14	61.50	53.18
Add Interest		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Add Tax		30.69	29.66	33.21	36.17	42.68	44.70	46.34	47.67	48.72	49.53
Total Inflows		415.53	377.86	375.26	372.58	396.94	394.10	391.17	388.15	385.05	381.85
Out Flows											
Capital Expenditure	-1467.06										
Increase in working Capital		-60.01	0.62								
Total Outflows	-1467.06	-60.01	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net Cash flows - Pre Tax	**-1467.06**	**355.52**	**378.48**	**375.26**	**372.58**	**396.94**	**394.10**	**391.17**	**388.15**	**385.05**	**381.85**
Project IRR	22%										
Net Cashflows Post Tax	**-1466.84**	**324.83**	**348.82**	**342.05**	**336.41**	**354.26**	**349.40**	**344.83**	**340.49**	**336.33**	**332.31**
Project IRR-Post Tax	19%										

13.12 NPV Calculation

		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		0	1	2	3	4	5	6	7	8	9	10
Net Cash flows - pre tax		**-1467.06**	**355.52**	**378.48**	**375.26**	**372.58**	**396.94**	**394.10**	**391.17**	**388.15**	**385.05**	**381.85**
NPV FACTOR	22%		0.82	0.67	0.55	0.45	0.37	0.30	0.25	0.20	0.17	0.14
NET PRESENT VALUE -PRE TAX	0.22	1479.85	291.41	254.29	206.66	168.18	146.87	119.52	97.24	79.09	64.31	52.27
Net Cashflows Post Tax		**-1466.84**	**324.83**	**348.82**	**342.05**	**336.41**	**354.26**	**349.40**	**344.83**	**340.49**	**336.33**	**332.31**
NET PRESENT VAUE-POST TAX	19%		0.84	0.71	0.59	0.50	0.42	0.35	0.30	0.25	0.21	0.18
	0.19	1476.87	272.97	246.32	202.98	167.76	148.45	123.04	102.04	84.67	70.28	58.36

13.13 ROCE Calculation

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10
Profit after tax		185.85	176.57	193.97	208.61	243.92	254.11	262.51	269.35	274.83	279.14
Capital Employed											
Net Fixed Assets		1268.06	1096.43	948.35	820.54	710.20	614.91	532.59	461.46	399.96	346.78
Net Working Capital		60.01	59.40	59.61	59.83	62.25	62.48	62.72	62.97	63.23	63.49
Total capital Employed		**1328.08**	**1155.83**	**1007.96**	**880.38**	**772.45**	**677.40**	**595.32**	**524.43**	**463.19**	**410.28**
ROCE		14%	15%	19%	24%	32%	38%	44%	51%	59%	68%
AVERAGE ROCE		30%									

13.14 Important Financial Ratios

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	0	1	2	3	4	5	6	7	8	9	10
BREAK EVEN SALES		506.41	463.63	427.41	396.76	372.02	350.39	332.35	317.43	305.22	295.36
BREAK EVEN POINT		62%	57%	53%	49%	43%	41%	39%	37%	36%	34%
RETURN ON CAPITAL EMPLOYED											
NET FIXED ASSETS	1467.06	1268.06	1096.43	948.35	820.54	710.20	614.91	532.59	461.46	399.96	346.78
WORKING CAPITAL	0.00	60.01	59.40	59.61	59.83	62.25	62.48	62.72	62.97	63.23	63.49
TOAL CAPITAL EMPLOYED	1467.06	1328.08	1155.83	1007.96	880.38	772.45	677.40	595.32	524.43	463.19	410.28
NET PROFIT (PAIDT)		185.85	176.57	193.97	208.61	243.92	254.11	262.51	269.35	274.83	279.14
RETURN ON CAPITAL EMPLOYED		14%	15.3%	19%	24%	32%	38%	44%	51%	59%	68%
AVERAGE RETURN ON CAP EMP		30%									

Chapter14

Project Deliverables and Conclusion

14.1 Need and Justification

The potential of pulses to help address future global food security, nutrition and environmental sustainability needs has been acknowledged through the UN declaration of the 2016 International Year of Pulses. Pulses are a Smart Food as these are critical for food basket (dal-roti, dal-chawal), important source of plant protein and help address obesity, diabetes etc. In addition pulses are highly water efficient, can grow in drought prone areas and help improve soil fertility by fixing soil nitrogen.

As of 2015, the world's biggest producers of pulses were **India, Canada, Myanmar, China, Nigeria, Brazil, Australia, USA, Russia, and Tanzania,** while the world's most important pulse exporters also include **Argentina, France, Ethiopia, and Turkey.** Despite being the largest producer of the largest varieties of pulses, the demand for consumption of pulses is just growing. This has led to a spurt in the prices of pulses in markets.

While the green revolution produced a three-fold increase in wheat yields in India, pulses have not received the same level of attention in Technology Adoption. To meet the demand of pulses, India is at present importing about 4.02 million tons. In order to ensure self-sufficiency, the pulse requirement in the country is projected at 32 million tonnes by the year 2030 which necessitates an annual growth rate of 4.2%. The gap of 4.5 million to 5 million tons is bridged with imported pulses.

The gap between supply and demand has been growing every year due to increase in population as well as consumption. ***In order to meet the projected demand of 32 million tonnes of pulses by 2030***, as per the Vision 2030 paper prepared by the Indian Institute of Pulses Research, ***will, however, require a paradigm shift in research, technology generation and dissemination, popularization of improved crop management practices, commercialization, Post Harvest Processing and Storage*** along with capacity building of the stakeholders in frontier areas of research.

It is imperative to develop and adopt more efficient crop-production technologies, Post Harvest Processing, Storage, along with favourable policies and market support to encourage farmers and processing industries.

The lack of advanced processing and lack of waste minimization technologies adoption by the processing industries is one of the major issues in the poor performance of pulses market. Government interventions in the pre processing and post processing sector would provide adequate support in achieving sustainability of the pulses demand.

The establishment of CFC in the cluster will minimize the wastage and will improve the quality of the pulses. Thus, the project is need based and support worthy.

14.2 Proposed Activity Chart after CFC

14.3 Expected Outcome of the Project

Particular	Present	After intervention
Units	119 units	150 units
Employment	Direct = 595 Indirect = 1500	New direct = 1000 New Indirect = 3500
Product Quality	The quality of product is little poor due to lack of advance processing machines and there is very little value addition taking place	Improved quality of product with product diversification and value addition
Market	Domestic and village/ local District market	Urban, National and international market
Average Turn over	Rs. 77.00 crores	Rs. 100 crores after two to three years of CFC
Processing Losses/Wastage	30% to 35% wastage and losses taking place	The percentage of loss can be minimized to 15% by the use of advance machinery at CFC
Testing	No such facility available	Test labs for standards and certification with state of art facility of FSSAI
Trade	High degree of dependence of the producer on the traders at the mandis	Direct access to profitable markets. Lowered dependence on traders
Export	Nil or very little indirect trade	Direct export likely by 5 units
Profits	Inconsistent profit margins due to price fluctuations, product quality inconsistencies and inefficiencies in production	Consistent and 20 to 25% higher profits for producers due to better quality and price and increased production efficiencies.

14.4 Implementation Schedule

Planning Timeline	Months																				
Tasks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Land Development and Boundary Wall																					
Electricity and Water facility Installation																					
Construction of CFC Building																					
Machinery Tendering/order																					
Arrival of Machinery																					
Erection of Machinery																					
Commissioning																					
Commercial Usage																					

Conclusion

India is the world's largest pulse producer accounting for 27-28 per cent of global pulse production. India harvests between 12- 15 million tonnes of pulses each year.

Andhra Pradesh is one of the important pulse-growing states in India with an area of 19.49 lakh hectares with a production of 16.23 lakh tones annually. The important pulses grown in Andhra Pradesh are Bengal gram, black gram, Red gram and Green gram. The area in Andhra Pradesh represents 6 per cent of the total area in the country. The Andhra Pradesh state ranks seventh in area and eighth in production.

The Sri Mahalakshmi Pulses Mills Cluster comprises of 119 Micro Pulses Processing industries, providing employment to rural population. These industries are using traditional mechanical and semi-automatic machineries as a result the production losses of 30% to 35% taking place. The cluster has other problems like raw material storage, testing and packaging problems which are hindering the growth of the cluster.

The establishment of CFC with advanced machineries will improve the productivity and quality of the products by many folds. The project financial feasibility suggest that the project is financially viable project.

Thus, the establishment of CFC at Sri Mahalakshmi Pulses Mills Dhal Cluster Machavaram, Rayavaram, East Godavari District, Andhra Pradesh is need based and support worthy. The establishment of CFC will help in socio economic development of the cluster region and cluster units.