

# CLEANING, GRADING & SORTING OF AGRO COMMODITIES

## 1. INTRODUCTION

Cleaning and sorting of agro commodities is in practice since ancient time. Initially, this process was carrying out at household level is now scaled up to industrial level looking to production and demand of all these commodities. It is necessary to clean, grade and sort all raw cereals, pulses, legumes, oil seeds and whole spices before any type of consumption or use in other products. Cereals, pulses, legumes, oilseeds and whole spices are needed specific post-harvest operations, start right from farm after harvesting, and divided into three stages: 1) Farm Level Operations; 2) Primary Processing and 3) Secondary Processing. The farm level operations include are: threshing, winnowing, drying and storage. The primary processing of whole agro-commodities include: cleaning, grading, sorting and packing; whereas, secondary processing includes value addition like grinding (flour or powder making); blending, flaking, baking, roasting, puffing, etc. It is necessary to use cleaned and sorted grains, pulses, legumes and whole spices for further value addition.

## 2. PRODUCTS AND ITS APPLICATION:

Cleaned, sorted and graded grains, pulses, legumes, oilseeds and whole spices can be used for direct consumption as such or by cooking. As well as for value added products by pulverizing, blending, flaking, extruding, roasting, puffing, baking, frying, etc. Such products having lot of ways for uses and applications.

### Plant Capacity & Product-Mix:

Sr. No.	Input Raw Materials	Days	TPH	TPD	TPA
1	Wheat	78	5.00	100.0 0	7,800.0 0
2	Rice	78	5.00	100.0 0	7,800.0 0
3	Pulses	78	5.00	100.0 0	7,800.0 0
4	Legumes	78	5.00	100.0 0	7,800.0 0
		312			31,200.

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### **3. DESIRED QUALIFICATION FOR PROMOTER:**

The promoter must be well versed with agro commodities, their trade, growing centres, key grower or brokers. The entrepreneur must have skill for sale of products and must get well versed with machinery technological features, their operations and maintenance. An engineering graduate with commercial exposure is preferable.

### **4. INDUSTRY OUTLOOK/TREND**

Agro commodities after harvesting needs cleaning and grading due to demand from consumers. In the past commodities were mainly sold uncleaned but now due to awareness and lack of time demand is for ready to use commodities even though price will be little higher. Moreover due to increase in production of agro commodities the facilities for cleaning and grading will be much higher than the present capacity.

India is now leading exporter of agro commodities. In international market importing countries ask for cleaned and graded products due to quarantine laws.

### **5. MARKET POTENTIAL AND MARKETING ISSUES, IF ANY:**

India is the world second largest producer of wheat and rice and fifth largest producer of coarse grains (maize, barley, sorghum). India is the world largest producer of pulses and legumes since 1961, producing 35% of world production, largest producer of beans, chick peas and pigeon peas. The major drawback in India is poor infrastructure for post harvesting, storage and logistics. Hence, need to increase farm level and primary processing of cereals, legumes, pulses, oilseeds and whole spices for daily consumption as well to manufacture value added products like: puffed cereals, cereal bars, and complete cereals foods for infants, dal analogues, and extruded, roasted and healthy cereal products.

The world production, consumption and demand situation of total grains are as under:

<b>WORLD ESTIMATES</b>					
	14/15	15/16	16/17 est.	17/18 f'cast.	
million tons				29.06	27.07
<b>TOTAL GRAINS <sup>a)</sup></b>					
Production	2051	2012	2126	2049	2038
Trade	322	346	352	349	349
Consumption	2010	1988	2084	2084	2083
Carryover stocks	457	481	523	480	478
<i>year/year change</i>	41	24	42		-45
Major exporters <sup>b)</sup>	150	154	181	156	150

## 6. RAW MATERIAL REQUIREMENTS:

As estimate of Ministry of Agriculture -India, the estimated production of cereals, pulses, soybeans, etc. Is as under:

Food Grains: Wheat, Rice, etc.	271.98 Million MT
Coarse Cereals: Maize, Sorghum, etc.	44.34 Million MT
Pluses: Gram, Tur, Urad. Etc.	22.14 Million MT
Oilseeds: Soybean, Groundnut, Castor seeds, etc.	33.60 Million MT

Hence, availability of raw materials in India is not a problem. The requirements of raw materials as per product-mix are as under:

Sr. No.	Raw Material	TPA
1	Wheat	7,800.0 0
2	Rice	7,800.0 0
3	Pulses (Chana Dal)	7,800.0 0
4	Legumes	7,800.0

	(Tuver)	0
		31,200.
		00

## 7. MANUFACTURING PROCESS:

Threshed, winnowed and sun dried grains, pulses, legumes and whole spices brought to the plant are first subjected to cleaning first. The two stage cleaning is carried out by removing first dust, dirt, light chaff are removed by air blast whereas large foreign impurities on first screen. The second screen is act as a grader. The broken grains are also get separated here which are then added to the process from where de-stoning get start.

The cleaned grains are then elevated and dropped into de-stoner to remove stones of all sizes. Thus de-stoned grains are then subjected to specific gravity separation for separating light foreign grains of same size. Then grains are conveyed to indented cylinder where the grains of same width and thickness are getting separated on length differences. For further precise sorting, the grains are subjected to electronic colour sorter too. Special machines are needed for rice polishing.

## 8. MANPOWER REQUIREMENT:

Sr. No.	MAN POWER CATEGORIES	Nos.
1	Technical Staff	8
2	Administrative Staff	4
3	Marketing Staff	6
4	Labour	20
	Total	38

## 9. IMPLEMENTATION SCHEDULE:

Project Stages	MONTHS									
	1	2	3	4	5	6	7	8	9	10
Purchase of Land	Yellow	Yellow								
Completion of Building	Green	Green	Green							
Ordering of Machinery	Grey	Grey								
Delivery of Machinery			Orange	Orange						
Term/Wkg Loan Sanction		Blue	Blue	Blue						
Installation of Machinery			Green	Green						
Commissioning of Plant					Red					

RM/Inputs Procurement										
Manpower Appointments										
Commercial Production										

### 10. COST OF PROJECT:

Sr. No.	Costing Heads	Qty	Rate/Unit	Rs. Lakh
1	Land in Sq. M. + Expenses	1,000.00		
		0	1,000.00	10.00
2	Building	500.00	9,000.00	45.00
3	Plant & Machinery			153.82
4	Contingency			10.00
	<b>Total Cost of Project</b>			<b>218.82</b>

### 11. MEANS OF FINANCE:

Sr. No.	Means Heads	Rs. Lakhs
1	Promoters Capital	54.70
2	Term Loan	114.12
3	MFPI Subsidy	50.00
	<b>Total</b>	<b>218.82</b>

### 12. WORKING CAPITAL CALCULATION:

Particulars	Total Amount	Stock Period Days	Value of Stock Period	Promoter Margin	Promoter Share	Bank Borrowings
Raw Material	13,767.00	15	688.35	0.50	344.18	344.18
Packing Material	249.60	30	24.96	0.40	9.98	14.98
Work in Process	14,299.34	3	142.99	0.40	57.20	85.80
FP Stock	14,391.00	15	719.55	0.40	287.82	431.73
Bills Receivable	14,391.00	15	719.55	0.40	287.82	431.73
Working Expense	12.00	30	1.20	1.00	1.20	0.00
<b>Total:</b>	<b>57,109.94</b>			<b>0.00</b>	<b>988.20</b>	<b>1,308.41</b>
				Interest @ 15%		196.26

**13. LIST OF MACHINERY REQUIRED AND THEIR MANUFACTURERS**

<b>No.</b>	<b>Equipment</b>	<b>Qty</b>
1	Cleaner Classifier	3
2	Aspiration Box	2
<b>No.</b>	<b>Equipment</b>	<b>Qty</b>
3	Aspirator	2
4	Permanent Magnet	1
5	Dry Destoner	1
6	Cyclon for System	1
7	Air Lock	2
8	Gravity Separator	2
9	Intermediate Separator	1
10	Elevators	4
11	Hoppers	2
12	Sortex Bin	1
13	Product Spouting	1
14	Aspiration Ducting	1
15	Bagging Spouts	1
16	Mechanical Erection	1
17	Air Compressor	1
18	Fans	4
19	CVT	1
20	Electrification	1
21	Air Conditioner	1
22	Compressor Piping	1
23	MS Structure	1
24	Sortex Machine	1
25	Sortex Cabin	1

- Buhler India 13-D, 12 D, 13 C and 13-B KIADB Industrial Area, Attibele, Bengaluru, Karnataka
- Forsberg Agritech (India) Pvt. Ltd.  
No. 123, GIDC Estate,  
Makarpura Opposite Manjalpura Police Chowki,  
Vadodara - 390010,  
Gujarat

**14. PROFITABILITY CALCULATIONS:**

Sr. No.	Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
<b>A</b>	<b>Gross Sales</b>	10073. 7	11512. 8	12951. 9	12951. 9	12951.9
	Less:					
1	Raw Materials	9636.9	11013. 6	12390. 3	12390. 3	12390.3
2	Packing Material	35	40	45	45	45
3	Fuel	0	0	0	0	0
4	Power	18.816	21.504	24.192	24.192	24.192
5	Manpower	55.185	62.26	69.335	69.335	69.335
6	Depreciation	37.107	42.408	47.709	47.709	47.709
7	Sundry Expenses	8.4	9.6	8.64	7.776	6.9984
8	Interest on Term Loan	9.583	10.952	12.321	12.321	12.321
9	Interest on WC Loan	135.8	155.2	174.6	174.6	174.6
9	Repairs & Maintenance	8.4	9.6	10.8	10.8	10.8
10	Marketing Expenses	70	80	90	90	90
<b>B</b>	<b>Production Cost</b>	10015. 19	11445. 12	12872. 9	12872. 03	12871.2 6
<b>C</b>	<b>Gross Profit (A-B):</b>	58.509	67.676	79.003	79.867	80.6446
	Taxes @ 40%	17.552 7	20.302 8	23.700 9	23.960 1	24.1933 8
	Net Profit	40.956 3	47.373 2	55.302 1	55.906 9	56.4512 2

The proposed unit will have the production capacity of 31,200 MT per year of various types of agro commodities. The unit cost of power is taken at Rs. 8. The depreciation on building is taken at the rate of 5% whereas for plant and machinery it is at 10%.

The average sales price of agro commodities is taken at the rate of Rs.46, 000 per MT for proposed project.

## 15. BREAKEVEN ANALYSIS:

Break Even Point	
Annual Fixed Cost x100/ Annual Fixed Cost + Profit	<b>84.</b> <b>46</b>

## **16. STATUTORY/ GOVERNMENT APPROVALS**

There is statutory requirement of FSSAI license for setting up of food processing industry. Moreover, MSME & GST registration, IEC Code for Export of end products and local authority clearance may be required for Shops and Establishment, for Fire and Safety requirement and registration for ESI, PF and Labour laws may be required if applicable. Entrepreneur may contact State Pollution Control Board where ever it is applicable.

## **17. BACKWARD AND FORWARD INTEGRATION**

As forward integration to the proposed activity, promoter may think of small packing of one kg. for retailing. This will need investment in packaging line.

## **18. TRAINING CENTERS/COURSES**

For food processing industry training and short term courses are available at Indian Institute of Food Processing Technology, Thanjavur, Tamil Nadu, Central Food Technological Institute, Mysore and ICAR-Central Institute of Post Harvest Engineering & Technology (CIPHET) Udyamimitra portal ( link : [www.udyamimitra.in](http://www.udyamimitra.in) ) can also be accessed for handholding services viz. application filling / project report preparation, EDP, financial Training, Skill Development, mentoring etc.

Entrepreneurship program helps to run business successfully is also available from Institutes like Entrepreneurship Development Institute of India (EDII) and its affiliates all over India.

### **Disclaimer:**

Only few machine manufacturers are mentioned in the profile, although many machine manufacturers are available in the market. The addresses given for machinery manufacturers have been taken from reliable sources, to the best of knowledge and contacts. However, no responsibility is admitted, in case any inadvertent error or incorrectness is noticed therein. Further the same have been given by way of information only and do not carry any recommendation.

Source:- Udyami Mitra/Sidbi