

Chapter 1

INTRODUCTION

Seed has been an important agricultural commodity since the first crop plant was domesticated by pre-historic man. For thousand of years, man cleaned seed of his food crops by winnowing. This is still an important process, but it is no longer adequate to supply the kind of seed needed by farmer.

Seed processing is a vital part of the seed production needed to move the improved genetic materials of the plant breeder into commercial channels for feeding the rapidly expanding world population. The farmer must get the quality seed that is free from all undesired materials because farmer's entire crop depends on it.

Seed can seldom be planted in the condition in which it comes from the growers. In fact, many seed lots contain weed or crop seed or inert material that make them unfit for sale without processing. Crop seed also frequently have stems, awns, clusters or other structures, which prevent from flowing through the drill freely.

Seed processing is that segment of the seed industry responsible for upgrading seed (Fig. 1), improving planting condition of seed, and applying chemical protectants to the seed.

Advantages of seed processing:

1. Make possible more uniform planting rates by proper sizing
2. Improve seed marketing by improving seed quality
3. Prevent spread of weed seed
4. Prevent crops from disease by applying chemical protectants
5. Reduces seed losses by drying
6. Facilitate uniform marketing by providing storage from harvest time until the seed is needed for planting.

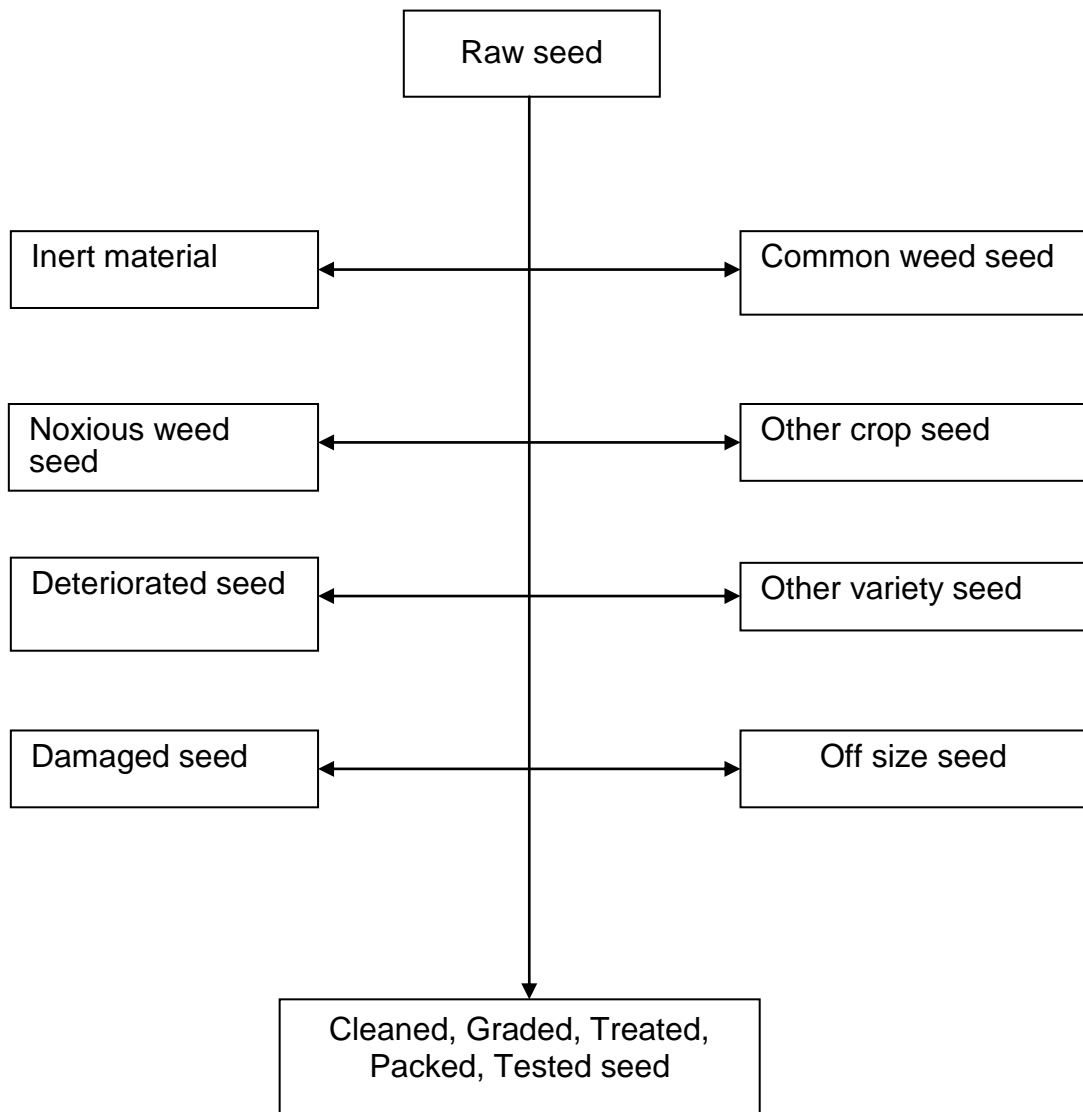


Fig. 1. Undesirable materials removed during processing of seed

An important factor to consider is the moisture content of the seed prior to processing. Seed with moisture content above 15% are subject to excessive damage in the processing line. In this case natural or artificial drying may be necessary.

Physical characteristics used to separate seed include size, length, weight, shape, surface texture, colour, affinity for liquids and electrical conductivity.

Seed processing can broadly be divided into various steps (Fig. 2). As the seed is received into the processing plant, it goes either directly into the

cleaning process or into storage to await processing. Drying may be necessary. As processing begins, the first phase (conditioning and pre-cleaning) consists of scalping, debearding, shelling or any other operation necessary to make the seed flow easily. The second phase (cleaning and grading) includes the removal of inert materials, weed seed, other crop seed, and broken seed that are larger or smaller than the crop seed and obtain the seed mass in the uniform size range of perforations of top and bottom screen.

After the desired purity is obtained, seed enters the final processing phase of separation based on specific characteristics like length, weight etc and treating and packaging. Processed seed is stored for later sale.

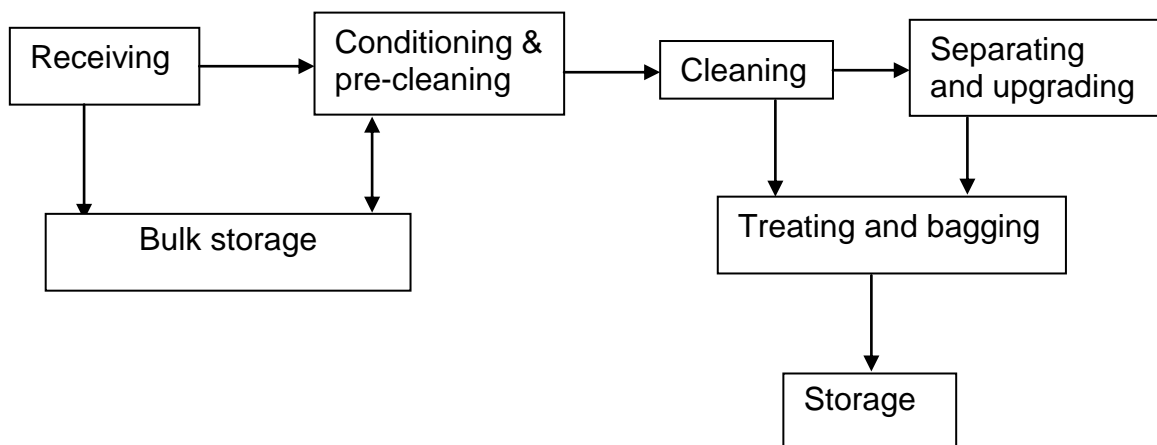


Fig. 2. Basic flow and essential steps in seed

Rationale

India is one of the major rice growing areas in the world and it is consumed by more than half of its population. The increase in rough rice production in the last few years is mainly due to the Green revolution and the introduction of high yielding varieties.

Orissa is major paddy growing state. The area under production is 4500000 ha with production of 7148400 tonnes and yield in the state is 1589 kg/ha. The paddy yield in the state is very low as compared Punjab and Tamilnadu

where the yield is 3346 and 3579 kg/ha, respectively. The non-availability of good quality seed is one of the main reasons of it. The sowing and harvesting time of paddy in the state is given in Table 1.

Table 1. Sowing and harvesting time of paddy

	Rabi		Kharif	
Sowing	Harvesting	Sowing	Harvesting	
Jan.	May-June	June-July	Oct-Nov.	

India's certified/quality seeds production/distribution of last five years is given in Table 2, which indicates that the requirement of certified seed is increasing year after year.

Table 2. Production/distribution of certified/quality seeds in the country

Type of seed	Production (lakhs quintals)				
	1996-97	1997-98	1998-99	1999-01	2001-02
Breeder seed	0.46026	0.46134	0.38994	0.50798	0.49850
Foundation seed	5.76	6.8	6.75	5.60	7.00
Certified seed	73.27	78.79	83.00	91.00	100.00

(Source: Economic survey of India, 2000-2001)

The production of paddy in the year 1996-97 was 81.30 MT. The target fixed for year 2011-2012 is 128.12 MT. For achieving this target, the gap (Table 3) between demand and supply of certified/quality paddy seed should be minimized by creating seed production and processing facilities in the state involving private sector at larger scale.

Table 3. Gap between requirement and production of certified seed of paddy

Year	Cropped area (M ha)	Seed requirement (Thousand tonnes)	Seed production (Thousand tonnes)	Gap (Thousand tonnes)
1986-87	40.8	306	132	174
1987-88	38.8	291	138	153
1988-89	41.8	313	166	157

Objective of Project

The State Government has accorded high priority to the upliftment of rural economy through the development of agricultural sector. Seed being vital input to agriculture, continuous efforts are being made to ensure availability of quality seeds to farmers in order to sustain the agricultural development.

In the present situation the demand of quality seeds is so high that the O.S.S.C. or any government agency alone can not meet the demand of quality seeds, which would be required to fill by the private seed projects.

In view of above, the project has been formulated with the objective to produce quality seed of paddy through scientific methods and adopting appropriate processing through establishment of seed processing plant.

Chapter 2

Logistics

A brief description of entrepreneurship capability of the proprietor, site location, seed production plan, requirements for setting up a seed company is given in this chapter.

2.1 Entrepreneurship

The seed processing unit will be under the proprietorship of Sri M. Venkat Rao, Age about 27 years, son of Sri M. Kandal Rao, At.- Padhanpali, P.O.- Patkulunda, P.S. -Barpali, Dist.-Bargarh and his brothers. Sri Rao completed graduation in Science, DCA from Utkal University, Bhubaneswar and also attended SIMAP (Small Industries Management Application Programme) from Osmania University, Hyderabad. This SIMAP course was sponsored by SIDBI (Small Industries Development Bank of India). Sri Rao belongs to farmer's family. His father Mr. M. K. Rao worked as a contract grower under the banner of Orissa State Seeds Corporation for 15 years. His brother M. Srinibas Rao is a member of Orissa State Seed Corporation. In the company of his father and brother, Mr M. Venkat Rao has the requisite experience about this business and can easily manage the unit.

2.2 Location

The proposed unit will be located at village Padhanpali, P.O. Patkulunda, P.S. Barpali, Dist. Bargarh (shown in Fig. 3). The location is well connected with road and is situated at a distance of 10 km from railhead. The network of canal in the locality provides assured irrigation needed for success of seed programme. It is surrounded by area where intensive cultivation of paddy is undertaken by farmers in two seasons. Farmers in the locality are highly motivated and have already worked in seed production for decades with OSSC.

The aforesaid consideration renders the identified location an ideal one for setting up a seed processing plant.

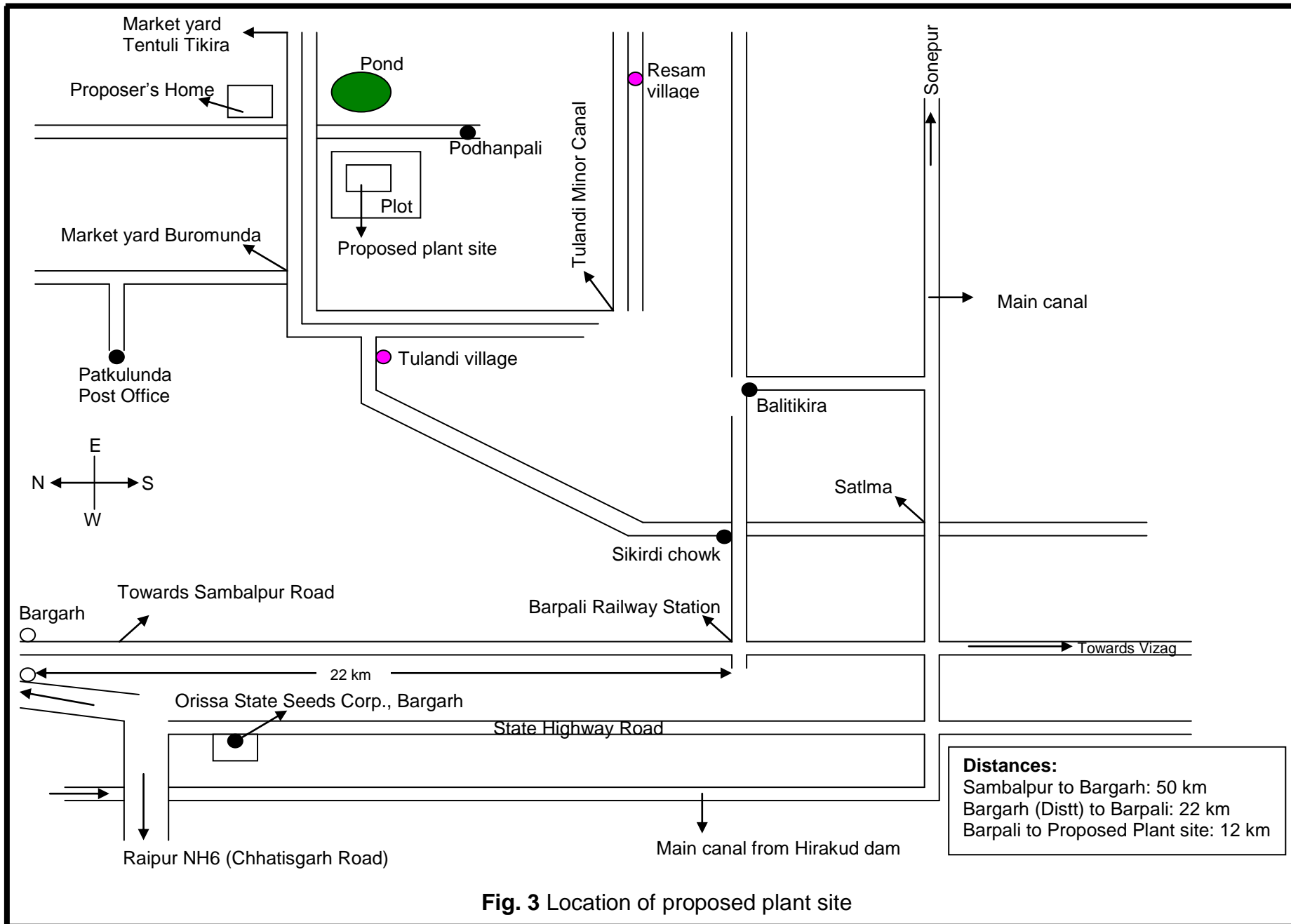


Fig. 3 Location of proposed plant site

2.3 Seed Production by Private Sector

Seed production by private sectors starts from the procurement of breeder seed from State Agricultural Universities and ICAR Institutions. Then the seed is cultivated by private sector or by contract growers with proper supervision of Orissa State Seed Certification Agency personals which is a third party certification agency of the state department of agriculture. The seed after harvesting is cleaned and graded. If germination of seed is acceptable as per seed certification standards, the OSSCA certifies the same for sale seed as certified seed.

The multiplication of seed chain starts from nucleus seed. This is then successively multiplied to breeders, foundation and certified seed, truthfully levelled seed with later being sown to produce commercial crops. In all this stages the quality control is paramount importance, as it is essential that trueness to type of variety be maintained. The company plans to procure foundation seeds from Agricultural Universities/NSC/SSC to support its certified seed production programme. Seeds of this stage are available from these agencies on placement of indent in advance.

2.4 Production plan

Bhulaxmi seed is a company dealing mainly in paddy seeds. They have already undertaken paddy seed production during the year 2004-05 and response has been very encouraging from private sector and also some quantity has been supplied to reputed organization like NSC. Company plans to expand and specialize in paddy seed production basically and later on add other crop and varieties in the product range slowly with the increase in demand.

Production plan of paddy seed is given in Table 4.

Table 4. Year wise seed production plan

Rabi season						
S. No.	Variety	Quantity, quintals				
		2005-06	2006-07	2007-08	2008-09	2009-10
1.	MTU 1001	1600	1700	1800	1900	2000
2.	MTU 1010	200	250	300	350	400
3.	IR 64	100	125	150	180	200
4.	Khandagiri	200	220	250	275	300
5.	Lalat	200	215	230	250	280
6.	Surendra	100	125	150	175	200
7.	IR 36	200	215	230	250	300
	Total	2600	2850	3110	3380	3880
Kharif season						
1.	MTU 1001	1000	1100	1200	1300	1500
2.	MTU 1010	200	250	300	350	400
3.	MTU 7029	1250	1300	1400	1500	1600
4.	IR 64	100	125	150	180	200
5.	Pooja	200	215	230	250	280
6.	Lalat	50	60	70	80	100
7.	Mahanadi	50	60	70	80	100
8.	Surendra	50	60	70	80	100
9.	Khandagiri	50	60	70	80	100
10.	Sarathi	50	60	70	80	100
11.	IR 36	50	60	70	80	100
	Total	3050	3350	3700	4060	4580
	Grand Total (Rabi & Kharif)	5650	6200	6810	7440	8260

2.5 Essential Requirements for success of Seed Company

Following are essential requirements for setting up and successful operation of a seed company:

- I. Farm
- II. Processing plant
- III. Electricity
- IV. Buildings
- V. Raw materials
- VI. Man power
- VII. Marketing

2.5.1 Farm

Farm is needed for undertaking production of certified seeds. In Indian conditions, contract growing of seed has become fairly acceptable and venture being profitable, farmers are coming forward to undertake seed production for reliable companies.

As has already been previously indicated, the proposed locality is having excellent irrigation facility and farmers are already aware of seed production programmes of OSSC, there is no problem in identifying experienced and progressive farmers willing to undertake seed production for the company. In the initial year, response has been very encouraging.

Owners of the company have their own farm, which would exclusively support production of foundation seed from breeder seed, if intended or planned at later date.

2.5.2 Processing plant

Seed processing plant will be equipped with all the machines needed for successful cleaning, grading operations. Similarly, seed storage is needed to store the seed during the period from receipt of seed at the plant till it is supplied to the dealer/farmer for sale.

Cleaner is the basic machine in a seed processing plant. Capacity of plant is accordingly known by the capacity of cleaners. The capacity of seed cleaners is specified in terms of wheat seed. While handling paddy, the capacity of machine reduces to half and hence the company would plan to establish a plant with sufficient capacity to process double the quantity of planned paddy production within the available processing period.

Considering the seed production plan, the company requires seed processing plant of 2 ton per hour capacity to handle present requirements as well as to handle future processing needs.

2.5.3 Electricity

Electricity is available from Orissa state electricity board. However, standby DG set would also be installed to take care of processing need in the event of power failure.

2.5.4 Buildings

Seed processing plant building, seed stores, reject store and office accommodation is needed to perform the processing and storage works successfully.

2.5.5 Raw material

Raw material for the certified seed production programme is foundation seed, which would be available from KVKs/University/SSC/NSC without any problem.

Other raw materials, like certification and packing material is available in the market, which would be purchased with printing in the name of the company.

2.5.6 Manpower

Adequate labour force is available around the area to work on the processing plant. This would rather be an opportunity for employment to rural youth in this backward rural area. Expert support will be available from OSSCA and other state agencies. Company also plans to employ agricultural graduate for internal quality checks.

2.5.7 Marketing

Company is using its own outlet for sale. Experiences of previous year indicate that company was able to sale about 40% of produce through own sale counter. Subsequent queries from farmers are encouraging. Rest of the material was sold through dealer or to NSC. Company plans to increase its dealer's network throughout the locality and also have suitable tie-ups with state/central agencies for sale of seed and anticipates that there would be no problem with sale of seeds.

Chapter 3

Seed Processing Plant and Buildings

Seed, as a component of the production phase in the grain industry can be considered as a mini industry that requires integration of production processing; storage, and marketing. Although only a small part of the total system, the seed has a strong influence on the viability of the industry, because as the most basic input, the seed sets the upper limits of productivity, product quality, and price.

Seed processing plant is designed based on the characteristics of seed grain and the impurities present in it, which need to be separated. Capacity of plant is known by the capacity of the seed cleaner which is the basic machine in the seed processing plant. Other machines, which work on the principle of separating the material, based on difference in characteristics of good seed and impurities are included in the plant. Capacity of such machines are kept matching with that of cleaner to have effective utilization.

3.1 Processing Machines

Brief descriptions of the processing machines used in a seed processing plant are given hereunder.

3.1.1 Scalper

Paddy seed contains contaminants of various kinds as it comes into the processing plant especially if it has not been harvested and threshed mechanically. To get the seed into condition to flow easily through the processing operations, to improve capacity and separating precision during processing, and to prevent loss of quality, seed is usually prepared for processing by sending them through one or more special machines or processes. A scalper can be used to rough clean seed when trash content is high.

The scalper basically consists of a vibrating or rotating screen or sieve. The screen perforations are large enough to allow the rough seed to pass through readily while large inert material is scalped off and removed from the seed lot.

3.1.2 Air screen cleaner

The air screen cleaner is the basic machine in almost all seed processing plants. The air screen cleaner uses three cleaning principles viz aspiration, scalping and grading. A common air screen cleaner for processing seed uses two air blasts and two screens. The first air system removes dust and light chaff before the seed reaches the first screen. The first screen allows the good seed to drop onto the second screen. The large foreign material rides over the first screen and is discarded. The second screen is a grading screen.

3.1.3 Specific gravity separator

Seed of same size and general shape can often be separated because they differ in specific gravity. This difference is very useful in removing light immature seed or heavy sand and rocks to improve the purity and germination of crop seed.

3.1.4 Indented cylinder

Seed of the same width and thickness can sometimes be separated by taking advantages of difference of length. Indented cylinder can do very precise separation by using length difference. The indented cylinder separator is a rotating almost horizontal cylinder with a movable horizontal separating trough mounted inside it. Thousand of half round indents line the inside surface of cylinder.

3.1.5 Elevator

Single leg bucket elevator consisting of receiving hopper, boot, bucket, belt, boot pulley, leg, head pulley, motor, drive and discharge spout will be used for conveying seed from one machine to another machine. It will lift the seed from the ground vertically upward and discharge it from top to the different machines. This type of elevating machines requires less power and floor area.

3.2 Design Criteria of Processing Machines

Generally the manufacturers specify capacities of processing equipments in terms of wheat only. Capacity of seed processing equipment and machinery in terms of paddy has been assumed to be 50% as compared to wheat. Working efficiency of processing equipment has been assumed to be 80% of the rated through put capacity.

Seed processing is a seasonal work. Seed requires drying, cleaning and packaging in an accelerated and continuous manner so as to complete processing load within the limited period available to enable seed maintaining its viability. Moisture content of the harvest at the time of receipt is usually 9 to 12% (wb) during both rabi and kharif seasons and hence will not require drying facilities.

Maximum seed volume to be handled at the proposed seed processing complex during the rabi will be 3120 quintals whereas during kharif season will be of the order of 3680 quintal as per proposed production plan given in Table 4. Hence, the cleaning cum grading capacity of the processing plant will be determined on the basis of 3680 quintals load. This amount of seed is to be processed during the period of 20 days. Seed processing during both the seasons will be conducted in 2 shifts per day basis with processing plant operating 16 hours a day.

Based on above assumptions, processing load and period available for processing, average seed cleaning-grading capacity (on paddy basis) works out to be 2 tonnes per hour. The details of various processing machines required in the project are given in Table 5.

Electrical energy will be made available by state electricity board. One standby diesel generating set of 45 kVA rating has been proposed for meeting exigencies in the event of power shedding/failure. The estimated cost is given in Table 6.

Table 5. Processing machines required in the seed processing plant

S. No.	Name of machines	Capacity	Qty.	Rate/ Unit, Rs in lakhs	Amount, Rs in lakhs
1.	Pre-cleaner	2 TPH	1 No.	2.00	1.50
3.	Seed Cleaner	2 TPH	1 No.	2.10	1.60
4.	Indent Cylinder	2 TPH	1 No.	1.30	1.30
5.	Specific gravity separator	2 TPH	1 No.	0.50	1.50
6.	Elevator up to 5 m height	2 TPH	4 No.	0.40	1.60
8.	Vacuum cleaner		1 No.	0.10	0.10
9.	Electronic moisture meter (Wet type)	-	1 No.	0.20	0.20
10.	Bag closer heavy duty	Nil	2 No.	0.04	0.08
11.	Weighing machine	100 kg	1 No.	0.40	0.40
		300 kg	1 No.	0.50	0.50
12.	Diesel generating set	45 KVA	1 No.	2.50	2.50
	Total (X)				11.28
13.	Spares parts for 3 Years @ 5% of amount (X)				0.564
14.	Installation, testing, commissioning of Machines @ 10% of amount (X)				1.128
15.	Laboratory equipments like germinator, hot air oven, weighing balance, divider etc				1.75
16.	Sum of S. No. 1 to 15				14.722
17.	Contingencies @ 3%				0.44
	Grand Total = 15.162 \approx 15.20				

Table 6. Estimated power requirement for the seed processing complex

S. No.	Machine	Power requirement, kW
1.	Pre-cleaner	5.0
2.	Cleaner cum grader	5.0
3.	Indented cylinder	2.0
4.	Specific gravity separator	5.0
5.	Elevators	8.0
6.	Bag closer	0.2
7.	Lighting load	3.0
	Total	28.2

3.3 Layout and Process Flow Operations

Process flow operation enables processing of seed through suitable machines. Elevators are provided with bypassing arrangements to bypass certain machines, if use of any machine is not needed in subsequent operation in particular seed lot. For example, all the lots may not need use of indented cylinder grader or specific gravity separator and hence in such case the elevator direct the seed to the next process by bypassing these units.

Layout of the plant will be made in a way to ensure minimum travel both vertical and horizontal to avoid injury to seed. Layout plan and process flow chart are given in Figs 4 and 5.

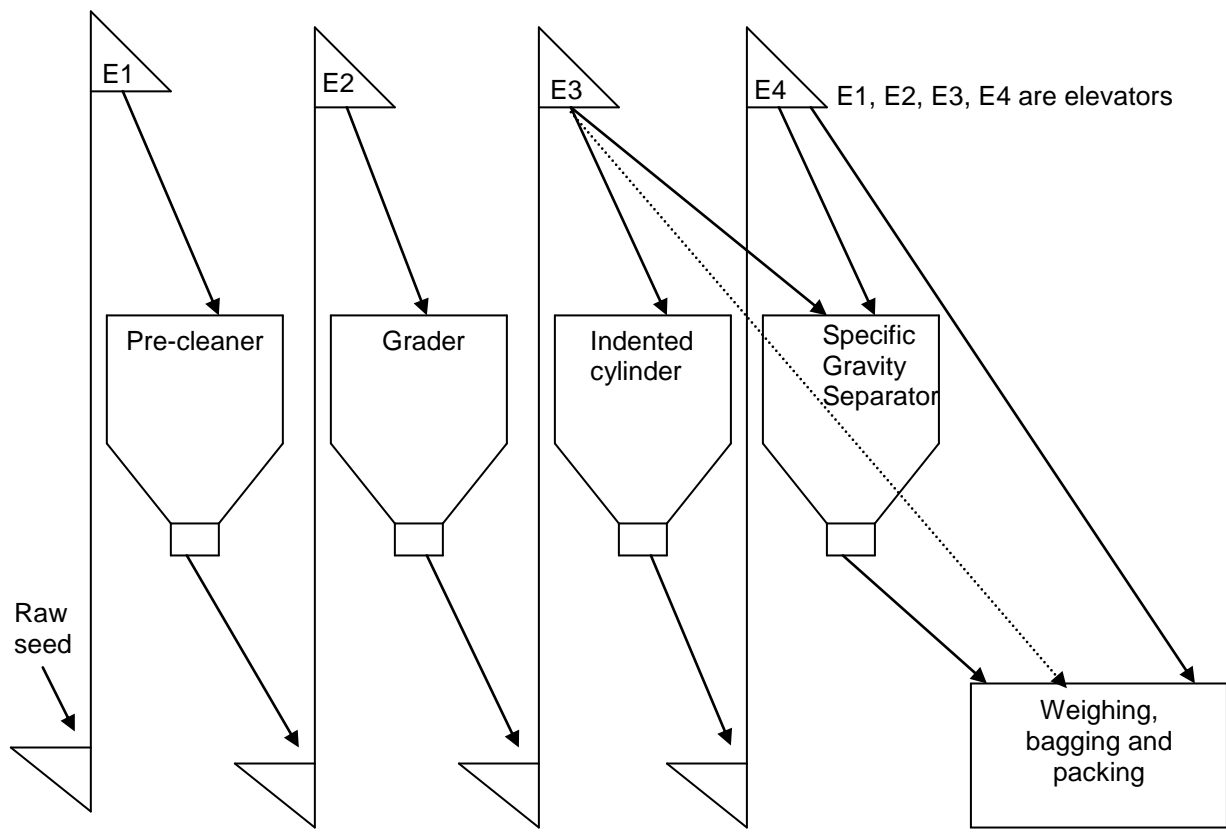


Fig. 4 Layout of seed processing machines

As shown in Fig. 4, raw seed will be fed to the pre-cleaner by elevator (E1). This machine will remove large size undesired materials from the seed. The partially cleaned seed will be fed to the cleaner cum grader with elevator (E2).

Here, the small undersized materials including undersized seeds will be separated on the basis of size difference and weight difference. The cleaned and sized seed will be fed to the indented cylinder by elevator (E3) whereby the broken and short seeds will be separated. The graded seed will be fed to the specific gravity separator by elevator (E4) for removing light seed. If it is not required then it will be bypassed. The processed seed will be packed, weighed and stitched with the help of weighing and stitching machine.

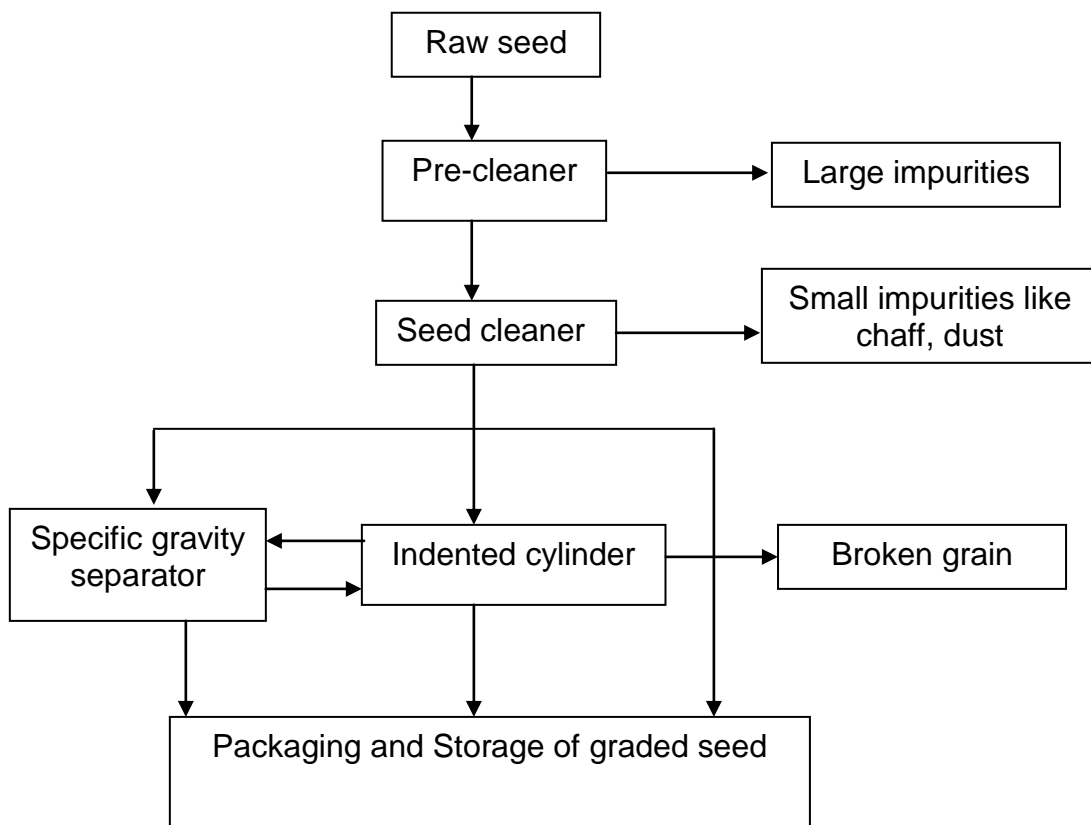


Fig. 5 Process flow chart of paddy seed processing

3.4 Packaging

After processing, the seed is packed. Bagging is usually the slowest and most costly operation in a seed processing plant. Bagging requires filling the bag to an exact weight, closing and labelling the bag. These operations are done either with hand or with manually operated machines, like weighing scale and bag closer.

Bagger-weighers are simple machines and are very accurate, easy to adjust and can fill 5 to 6 or more bags per minute. Bag-sewing machines are precision, high-speed machines.

The label is attached to the seed bag, or it is printed directly on to the container or bag. The label contains all-important information about the seed. Complete processing records need to be maintained to trace the seed from the time it is received at the plant until it is sold with full details of operations.

A processing plant record system include following records:

- i. Receiving
- ii. Drying/storage
- iii. Processing, treating and packaging
- iv. Testing
- v. Storage
- vi. Inventory
- vii. Sale

3.5 Seed storage

Good seed storage is an important phase of processing and is essential to successful seed marketing. Proper storage preserves seed viability, from harvest to sale, and protects the producer, the processor and the user.

The storage is provided for seed from the time of harvest until planting time. Storage is provided for seed that may be carried over until the planting season in the next or a subsequent year.

The rate of deterioration of crop seed in storage increases as seed moisture content increases. Mature seeds are hygroscopic and hence their moisture contents vary with the relative humidity of the atmosphere. Moisture absorption or desorption of seed is a relatively slow process. Moisture content and temperature are important factors in seed storage. Dry cool conditions are best for seed storage.

3.6 Seed Processing Plant Building Layout

Seed processing plant building will comprise of following components:

1. Receiving-cum-drying platform
2. Processing area
3. Auxiliary building

3.6.1 Receiving-cum-drying platform

An open platform of size 10m x 10m will be provided. The platform will be having a plinth of 0.9 m above the ground level. This area will be utilized to receive the raw seed and to sun dry small lots of crop seeds. This area can also be utilized for storage of seeds on wooden palettes. The platform will be connected to processing shed through a rolling shutter.

3.6.2 Processing area

The processing area will be situated between the shed and ventilated storage building. The hall will be connected to ventilated flat stores through a covered gallery for easy movement of processed and packaged seed to seed stores. The hall will have a big rolling shutter of size 3m x 3m in the processing plant to permit entry of seed processing equipment into the hall for installation.

The processing hall will be of size 20 m x 10 m x 6.5 m. Height will be kept to facilitate installation of the seed processing equipment and machinery. A sequence of processing machines to be installed is shown in Fig. 6. Floor of the processing hall will be 0.9 m above the ground level. Roof will be of tubular trusses covered with asbestos sheet.

The shed will have sufficient provision for natural as well as forced ventilation in order to maintain congenial atmosphere inside the shed. The shed will accommodate seed scalping, seed processing and packaging equipment and will have sufficient space for weighing and packaging.

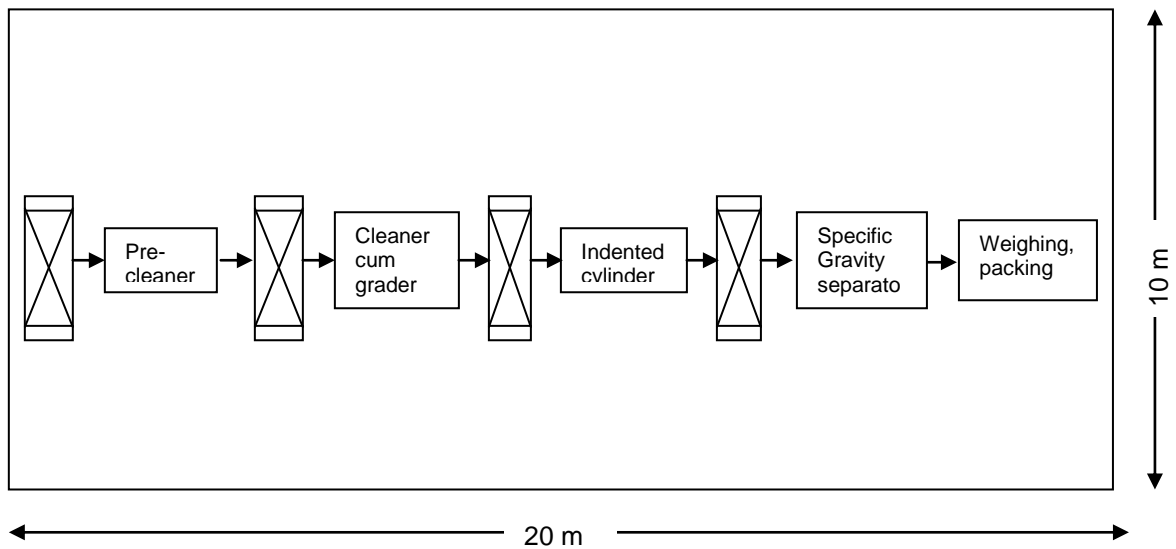


Fig. 6 Sequence of processing machines to be installed in processing hall

3.6.3 Auxiliary building

In addition to building discussed above, a provision will also be made for generator room. The plinth area and cost estimate is indicated in Table 5. Sufficient length of road will be provided to connect various functional buildings with each other and main highway. Internal road will be 3.6 m wide. Boundary wall will be provided all around the complex for security reasons.

One tube well is available at the site, which will be used for construction works and drinking as well.

The site is outside the municipal limits and as such no sewage system exists. A septic tank with soakage pit will be provided for disposal of effluents. Entire complex will have a good drainage system.

Provision for fire fighting equipment such as extinguishers, water buckets, sand buckets etc will be made to fight minor fire hazards. The purchase of these items will be made through contingency grant.

The processing plant building will be constructed as per CPWD/PWD norms. It will have tubular trusses, AC sheets pitched hole roof, cement concrete flooring finished with water-proofing cement paint, aerated, ventilated, rat proof and bird protection. Sealed doors will be provided in these buildings. Buildings will be suitably planned to have interconnection for movement of seeds and materials. Details of requirement of building complex and their cost estimate are given in Table 7. Tentative layout plan is given in Fig. 7.

Table 7. Building structure of the seed processing plant

S. No.	Description	Area	Rate/Unit (in Rs.)	Amount (Rs. in lakhs)
1.	Threshing/drying platform with 0.90 m plinth height	100 m ²	750/m ²	0.75
2.	Plant building for temporary store of raw seeds, processing machines as per layout plant	200 m ²	3500/m ²	7.00
(a)				
(b)	Room for DG set 45 KVA	25 m ²	3000/m ²	0.75
(c)	Room space for Plant Incharge, certification packing material, chemicals, workshop for storing of spare parts, tools, processing screens and toilet etc.	50 m ²	3500/m ²	1.75
3.	Seed storage, 250-300 tonnes	200 m ²	4000/m ²	8.00
4.	Boundary wall (200 m)		900/m	1.80
5.	Cement concrete Road (125 m x 4 m), 25 cm thick	500 m ²	500/m ²	2.50
6.	Site development like drainage, security etc @ 10% total expenditure given above			2.20
	SUB TOTAL			24.25
	Contingency @ 3%			0.73
	GRAND TOTAL = 24.98 \cong 25 lakhs (Rs twenty five lakhs)			

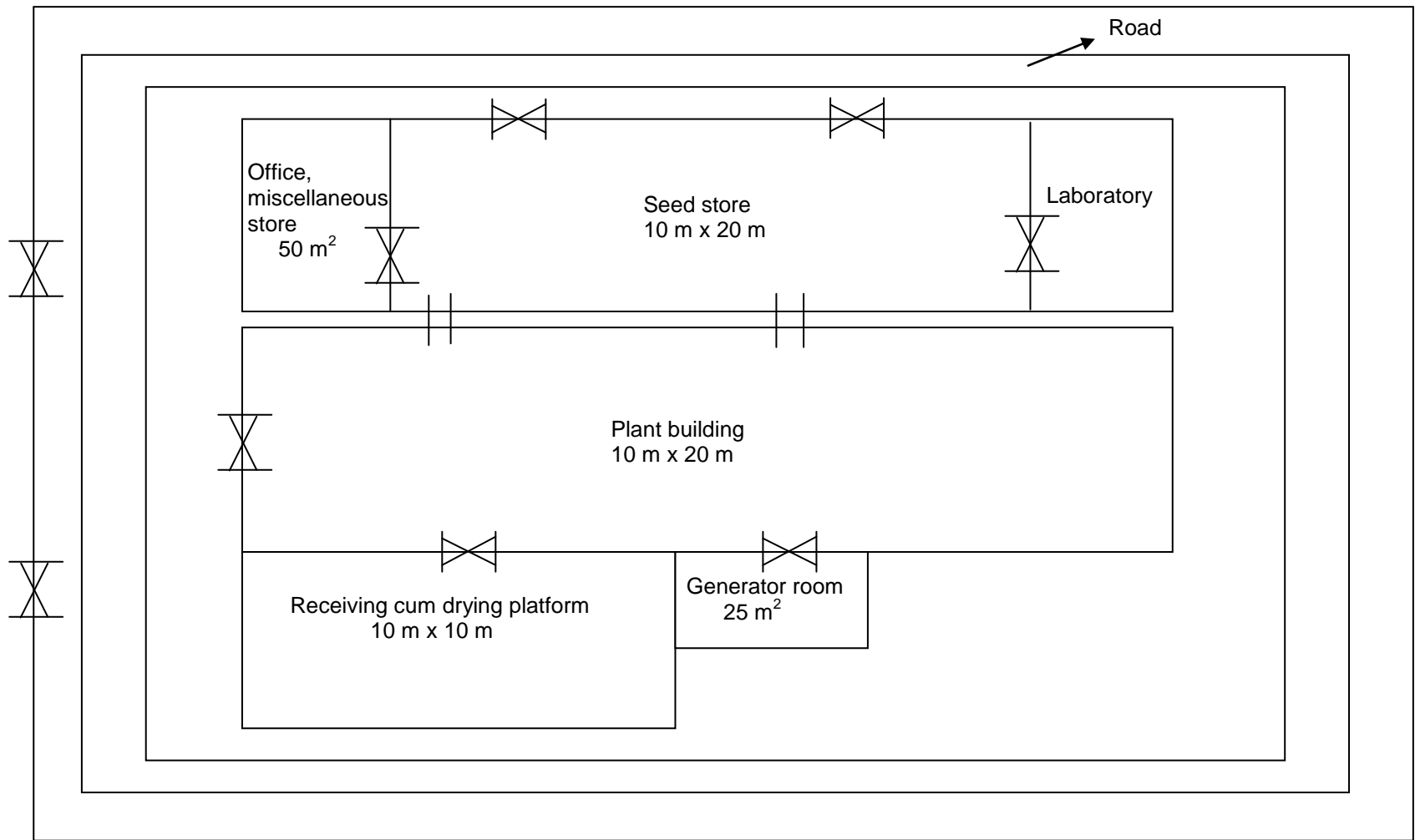


Fig. 7 Building layout plan

Chapter 4

Financial Analysis

Total capital investment for this project is estimated to be around 40.20 lakhs, which includes the cost of civil work, equipment and machinery (Table 8) but excluding the cost of land, which belongs to the entrepreneur and will be available for this project. Any other cost involved in consultancy, office furnishing etc could be managed within the contingency. This project has been planned to implement immediately and site is ready for work to be started just with the approval of loan by financing institution.

Schedule of civil work, purchase of equipment and machinery shall be synchronized to ensure that the plant is ready for processing the produce in November-December to make available paddy seed for January sowing. Balance civil work would be completed by March i.e., within the financial year 2005-06.

Table 8. Summary of project cost

S. No.	Particulars	Cost, Rs in lakhs
1.	Plant machinery and equipment	15.20
2.	Building and civil works	25.00
3.	Cost of Land	Own
	Total	40.20

4.1 Funding of the project

Out of estimated cost of 40.20 lakhs, Rs 10 lakhs would come, as subsidy from Government of India under the scheme of GOI for boosting the seed production in private sector and Rs 26 Lakhs is proposed to be taken as Long Term Loan from the bank. As the subsidy is back-ended, eligible amount of subsidy 25% i.e. Rs 10 Lakhs would initially be taken as term loan from the bank to be adjusted from the subsidy that would be made available by GOI. Arrangement of working capital would be separately made for undertaking the business. The entrepreneur shall contribute balance amount of Rs 4.20 lakhs plus the land required for the project

4.2 Schedule of Implementation

Implementation schedule of establishment of the seed processing complex is given in Table 9. Processing plant building, boundary wall, front road, generator room, drying platform, laboratory and office shall be completed immediately within 2-3 months after approval of loan. Simultaneously, processing machinery shall be purchased and installed and plant commissioned to undertake processing in the first season. Other buildings and ancillary works like road, seed store, drainage system etc shall be started by November 2005 and would be completed by March 2006.

Table 9. Project implementation schedule

S. No.	Activities	Completion schedule, month						
		1	2	3	4	5	6	7
1.	Site selection	Completed						
2.	Approval of project	To be completed before start of project						
3.	Tendering award of contract and construction of 1 st phase of civil work	■						
4.	Purchase of processing machinery, delivery and installation		■					
5.	2 nd phase construction work, outside electrification, etc.				■			

4.3 Schedule of Production

Entrepreneurs are already in business since last year. Kharif crops of 2005-06 are in the field which would be harvested during Oct-Nov. and rabi sowing shall be undertaken during Nov-Dec. Part of kharif production is sold in Nov-Dec for rabi sowing and balance is carried for June sowing. Similarly, part of rabi produce is sold for kharif sowing in June-July and balance is carried for Nov. sowing. While working out capital requirement, it is presumed that 70% would be sold immediately and 30% would be carried forward. While 30% of kharif production is sold in next financial year, whole of rabi produce is sold in the same financial year in which it is produced/purchased.

4.4 Variable Production Cost

Schedule of operational expenses is given in Annexure I.

4.4.1 Cost of raw seed

Paddy seed shall be grown by the farmers on contract basis. Produce shall be received at the processing plant after moderate cleaning by farmer and would be purchased with adjustment of weight on 12% (wb) moisture content.

It has been observed that generally good seed recovery after processing is possible to the extent of 90% after processing. Out of the remaining 10%, almost 2% of material is waste and valueless while another 8% can be sold as grain at reduced price for milling and consumption. The cost of raw seed has been taken at a rate of Rs 650 per quintal.

4.4.2 Seed certification and packing cost

Certification and packing material cost includes the cost of bags, labels, leaflets, tags, lead seals etc. Cost of these materials has been worked out, taking into consideration the present cost and worked out on per quintal basis as given in Table 10.

Table 10. Seed certification and packing cost

S. No.	Item	Rs/quintal	Remarks
1.	Bags	37.50	Seed will be packed in jute canvas bags costing Rs 15 per bag
2.	Certification materials like labels, leaflets, tags, lead seals, thread etc.	2.50	Labels @ Rs 170 per 1000. Leaflet @ Rs 250 per 1000. Tags @ Rs 170 per 1000. Lead seals @ Rs 30 per kg. Thread @ Rs 40 per 1000 m.
		Total = 40.00	

For the purpose of financial calculations cost of certification and packing has been taken at the rate of Rs 40 per quintal on processed seed quality.

4.4.3 Seed processing cost

Seed processing mainly involves expenditure on electricity and diesel and labour involved in processing operations. Total power required for operation of

the plant is 21 kW. The entire machines will not operate all the time. Presuming 0.80% of maximum power demand in processing plant, it is estimated that energy consumption in a shift of 7 hours would be approximately 112 kWh, which will cost about Rs 500 per shift. Similarly, 5 labourers engaged in a shift will involve expenditure of Rs 500. Assuming that 80 quintals of paddy would be processed and packed in a shift, the cost on this component would be approximately Rs 12.50 per quintal, which has been considered in calculations. Separate provision for diesel has not been made. It is presumed that when electricity is not available, the saving in the cost of electricity will support the expenditure on diesel for running the generator set.

4.4.4 Transport cost

Seed production is proposed to be organised in the nearby areas of processing plant. Material shall be delivered by the growers at the processing plant at their own cost. Similarly, dealer/farmer will lift the material from the godown and hence no provision for transportation has been made.

4.4.5 Repair and maintenance

Processing machineries shall be purchased with enough spares to support 3 years of requirement. A provision has been made for repair and maintenance to the tune of 1% of the cost of plant machinery and buildings.

4.5 Semi Variables and Fixed Cost

4.5.1 Salaries

A manager shall be appointed by the company at a salary of Rs 5000 per month. Provision for 6 months salary has been made in the first year i.e. 2005-06. Another staff (an Accountant) shall be appointed at a salary of Rs 3000 per month from the year 2007-08. Provisions have been made accordingly.

4.5.2 Administrative and general overhead

A provision at the rate of 1% of turn over has been made towards this overhead from the year 2006-07 onwards.

4.5.3 Selling and promotional overhead

This will be mainly to popularise the seed. Provision of 1% of turnover has accordingly been included in the project from 2006-07 onwards.

4.5.4 Insurance

Provision of insurance has been made at the rate of 0.5% of capital cost from 2006-07 onwards.

4.6 Turnover

Seed produced by the company would be sold at a net rate of Rs 1100 per quintal. This rate would be for 90% of the material purchased, 8% of the material would be sold at Rs 500 per quintal. The remaining 2% may fetch some income but has not been considered as income for calculation purpose. Schedule on purchase and sale of seed and expenditure and recovery involved therein is given in Annexure II.

4.7 Other Financial Cost

4.7.1 Depreciation

Depreciation is taken at the rate of 5% for building and 10% for plant machinery. For the first year, no provision shall be made on account of depreciation, as the plant would be completely ready by the end of 2005-06. Year wise depreciation as given in Table 11 has been included in financial calculations.

Table 11. Year wise depreciation on machinery and building

Year	(Rs in lakhs)		
	Machinery	Building	Total
2005-06	-	-	-
2006-07	1.50	1.25	2.75
2007-08	1.37	1.15	2.52
2008-09	1.23	1.13	2.36
2009-10	1.11	1.07	2.18
2010-11	1.10	1.02	2.12
2011-12	0.99	0.97	1.96
2012-13	0.90	0.92	1.82
2013-14	0.80	0.88	1.68

4.7.2 Interest on long-term loan

Provision of interest on loan of 100% investment has been made at a rate of 11.75 % on long term loan and 11.25 % on short term borrowing (limit) and interest thereon during the first year i.e. till March 2006 shall be capitalized and provision for payment of loan has been made from the year 2006-07. However, as per provision of the scheme interest on subsidy amount shall not be charged and it is kept separately. Subsidy is adjusted as last instalment of term loan and interest shall be credit of entrepreneurs. Similarly, provision of 11.25 % interest is made on the limit fixed (8.0 lakhs) by the bank for the period of 6 months in first 4 years.

4.7.3 Tax

Provision for tax at a rate of 30% and 10% surcharge on tax amount, on net profit after interest liability and depreciation, has been made after the company start making cumulative profit from the year 2009-10.

4.8 Margin Money

Entrepreneurs proposes to place 8.0 lakhs required working capital for first 4 years. Only needed amount of working capital/ limit shall be drawn to meet operational needs such as purchase of seed, processing cost etc.

4.9 Profitability and Economics

Profitability of the project is given in Table 12. It may be seen that the project would start earning profit from the year 2006-07 itself. Trend of profitability over the years can also be seen from the Table.

4.10 Rate of Return

Financial rate of return works out to be more than 20% before payment of interest on long-term loan and taxes. The project is therefore sound enough for financing.

4.11 Break Even Analysis

The break even point indicates the level of sales at which the semi variable and fixed expenses of the project are absorbed. In the proposed project, the

break even point is reached when a turn over of Rs 40.25 lakhs is obtained or 6559 quintals of seed is handled amounting to 33 % of business at maturity.

4.12 Cash Flow

Cash flow analysis for a period up to the year 2013-14 is given in Table 13

4.13 Pay back period

Analysis on cash flow and repayment given in Table 13 indicate that total loan (long term) drawn in establishment of the project is returned by the year 2012-13 in the year wise break-up given in Table 14.

Table 14 Long-term loan repayment schedule.

YEAR	PRINCIPAL REPAYMENT 36 lakhs	INTEREST (Rs in Lakhs)
2006-07	2.00	6.12(On 26 lakhs)
2007-08	2.00	2.82
2008-09	2.00	2.59
2009-10	3.00	2.35
2010-11	3.00	2.00
2011-12	4.00	1.65
2012-13	5.00	1.18
2013-14	5.00	0.59
2013-14	10.00 (GOI Subsidy)	-
Total	36.00	19.3

Thus, total principal amount returned = 36.00 lakhs (10.0 lakhs by GOI & 26 lakhs by entrepreneur) and Interest paid= 19.3 lakhs(on long term loan).The repayment schedule will be drawn on the loan amount (including subsidy) that the total subsidy amount is adjusted after the full bank loan component and no interest is charged on subsidy amount. The subsidy released by Government of India will be kept in a separate borrower-wise account.

4.14 Conclusions

Quality seed is one of the most important input for enhancing crop production and productivity. The gap between the availability and the requirement of quality seed is quite high in the country and therefore needs proper attention. Hence, the efforts of central government to encourage the

farmers/entrepreneurs for quality seed production and processing by providing subsidy is time driven and would prove to be a worthy exercise in meeting the country's need in the agricultural sector.

The project has been proposed with the aim to establish a 2 tonne per hour capacity seed processing plant. As is evident from the financial analysis that the project is sound and estimated results are encouraging and hence the project may be considered for financing under the scheme of GOI for boosting seed production in private sector.

