Spice

POST GRADUATE PROGRAMME IN AGRI BUSINESS MANAGEMENT

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SEED BUSINESS: Indian Scenario

INTRODUCTION

"A successful variety of seed is one with a total balance of traits that makes it more profitable for growers than any other one they might choose."

- Lewis and Christiansen, 1982

Agriculture accounts for 28 percent of the GDP of India. With a growth rate of 2.7 percent per annum since independence, it is greater than the annual population growth rate.

Seed is a fundamental, crucial and yield enhancing input for sustained growth in farm production. The role of the seed sector is to ensure adequacy, seed quality and varietal diversity.

The Indian seed programme is still in its nascent stage. Out of US$ 920 million sales, the domestic offtake accounts for US$900 million sales and the remaining US$ 20 million sales only accounts for the global market.

Of the 90 million hectare area under food crops, a mere 10-12 percent area is under quality or certified seeds. Fragmented land holdings and the lack of inputs force the farmer to use farm-saved seeds. The success of the green revolution has however helped to change the mindset of the farmers in a great way regarding the use of high yielding seeds and ensured more adaptability for hybrid seeds.

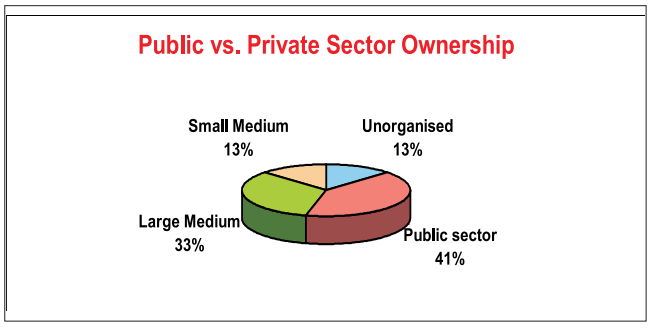
The use of hybrid seed is very low but awareness about the high yield and good quality of product from hybrid seeds attracted the farming community to switch over to new varieties and hybrid seeds. The farmers' acceptance of modern technologies of farming and availability of hybrid seeds in several regions is also a positive indication for the growth of the seed industry.

DEVELOPMENT OF THE INDIAN SEED INDUSTRY

The beginning of sorghum and pearl millet seed production and distribution can be traced to the second decade of the 20th century. The history of the sorghum and pearl millet seed industry is intertwined with the birth and growth of the Indian seed industry in general. To recapitulate history in a chronological order, there are three major periods -- pre-independence (1900 - 1946), early post-independence (1947-1959) and post-independence (1960-1995) eras. The prominent milestones in the history of the sorghum and pearl millet seed industry are the establishment of the All-India Coordinated Project on Sorghum Improvement in 1960, the All-India Coordinated Pearl Millet Improvement Project in 1965, the establishment of the National Seeds Corporation in 1963, and the establishment of a seed company in the private sector, the Maharashtra Hybrid Seed Company (MAHYCO) in 1964.

To meet the gigantic demand of seed supply for a growing population of over 50 crores, the World Bank supported the National Seeds Project (NSP), that was launched in three phases from 1975 to 1993. Thirteen State Seed Corporations (SSC) were established to take over the production and distribution of quality seeds in larger states. Both NSCs and SSCs were established to take over the production and distribution of quality seeds in larger states and expected to fulfill the needs of the farmers at reasonable prices and on time. NSC contributes 5 percent with 3 percent value of the total market stocks handling 75 crops and 420 varieties to meet the needs of a wide segment of the farming community suitable to various agro climatic zones and enjoys the faith of the middle and lower segment of the Indian farming community.

The actual process of deregulation of the government controls in the seed industry started with the New Seed Policy of 1988. Subsequently, the private companies grew fast and currently there is a 60:40 ratio between the private and public sectors. There are more than 200 private seed companies of which over 30 percent have global partners. The role of the 13 state owned corporations has declined and they now deal with government notified products.



Source: Industry sources, Rabobank International

WORLD SEED MARKET

There are about 1500 seed companies existing in the world but the power distribution is highly skewed. Twenty four companies control 50 percent of the commercial market and the concentration is expected to increase further. The profits of these companies will be kept in check by strong competition and farmers using farm-saved seeds, if the seed prices rise. Therefore, seed companies are on the look out for new markets to increase their seed sales.

Table:1 Seed sales and world market share of top ten seed companies (2000)

Company	seed sale (US $ million)	Share of world market
Dupont (Pioneer)	$1,938	27.0%
Monsanto	$1,600	22.0%
Syngenta (Switzerland)	$958	22.0%
Groupe Limagrain (France)	$622	13.0%
Grupo Pulsar (Mexico)	$474	6.5%
Advanta (UK and Netherlands)	$373	5.2%
Dow (US)	$350	5.0%
KWS AG (Germany)	$332	4.6%
Delta Pine	$301	4.3%
Aventis (France)	$267	3.7%

Source: RAFI, 2001

The total commercial market for seed at present is estimated to be around US$ 30 billion. However, there is still a substantial Asian market waiting to be tapped. The most important seed markets are the US and the EU. In the recent past, the European market has reached saturation and has experienced a 10 percent fall in consumption in the last four years. However, consumption in Asia is now increasing at an annual rate of 1.3 percent, and has reached 43.2 million tons, out of which rice alone accounts for 16 percent. Asia has been the largest purchaser of agriculture seed since 1990.

Table:2 Worldwide Export of major crop seeds (million US $)

Crops	Seed Exports
Maize	530
Herbage crops	427
Potato	400
Beet	308
Wheat	75
Other agricultural crops	750
Horticultural crops	1150
Total	3640

Source: Seed Association of India

The major trends in the world seed market

- Intensifying international competition
- Shorter life cycle for new varieties
- Increasing R & D costs
- Increasing concentration within the food processing and retail sector

The world population is expected to grow at a rate of 1.5 percent by 2010, while yield increase for crops is expected to be around 1.3 percent. With income levels in Asia and the GDP in South Asia growing at a rate of 5 to 10 percent per annum, there will be an increased demand for food. With Europe reaching a saturation point, Asia is set to emerge as the new market.

Table:3 Estimated values (million US $) of the commercial markets for seed and planting material for top ten countries

Sr. No.	Country	Internal Commercial Market
1	USA	5,700
2	China	3,000
3	Japan	2,500
4	CIS	2,000
5	France	1,370
6	Brazil	1,200
7	Germany	1,000
8	Argentina	930
9	India	900
10	Italy	650
World Total Commercial Seed Market		**24,567**

Source: Seed Association of India

INDIAN SEED INDUSTRY

When the Indian seed industry is compared with the global scenario, the estimated turnover ($ 900 million) is less than 2 percent of the global seed business of US $ 25 billion. With one sixth of the world population and the second largest cultivable land, the Indian seed industry presents a poor picture.

There are many factors that influence these trends. Cultivation in India is more self-oriented than market oriented. The average farmer tries to grow as many commodities as possible on his land, regardless of the economics of production. The farmer prefers to grow more than one variety of even the main crop as a risk aversion measure. Catering to these varied needs in different parts of the country is definitely a daunting task for the seed industry, though it also holds great promise.

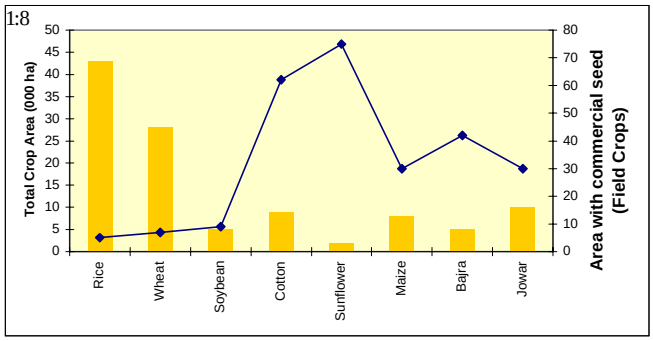
With world trade expected to reach US $ 75 billion by 2020, India can easily walk away with a major chunk of the seed industry with careful planning and smooth regulations.

Seed production in India is different compared to the developed nations. Multinational companies in developed nations carry out the seed production on their own farms. In India, however, it is mainly carried out in the farmer's fields under a contract. While this ensures better returns for the seed growers, it adversely affects the quality of seed. Majority of the Indian farmers being small or marginal, seed production is distributed over a large area, which not only results in the lack of uniformity in the seeds but also leads to contamination. Maintaining varietal purity in such cases becomes difficult.

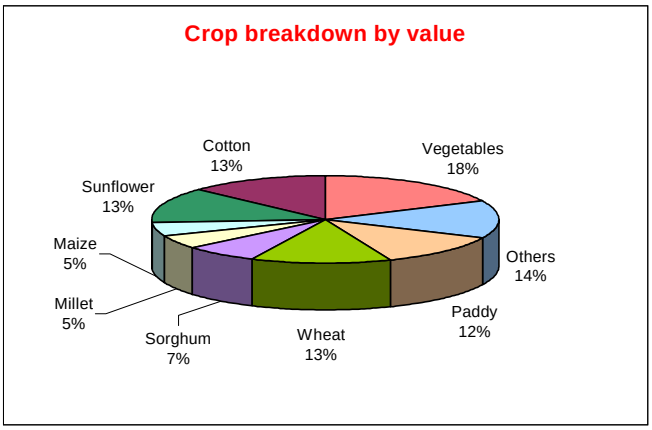
While public sector companies produce seeds locally, private sector companies produce seeds only where the agro-climatic conditions are most favourable and transport the seed wherever required, ensuring greater economies of scale

The public sector produces self pollinated crops, of which wheat and rice account for about 60 percent. The private sector deals with mostly improved hybrids and high-value, low volume seeds. Vegetable seeds account for about 18 percent of the total production of certified seeds.

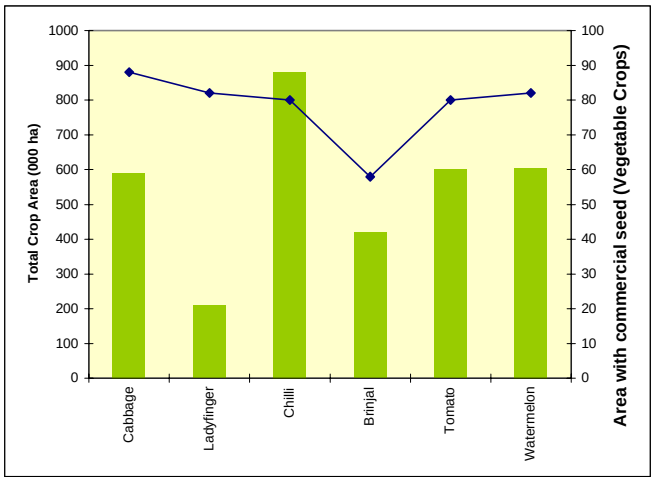
The area growing commercial seeds



Source: Industry sources, Rabobank International



Source: Industry sources, Rabobank International



Source: Industry sources, Rabobank International

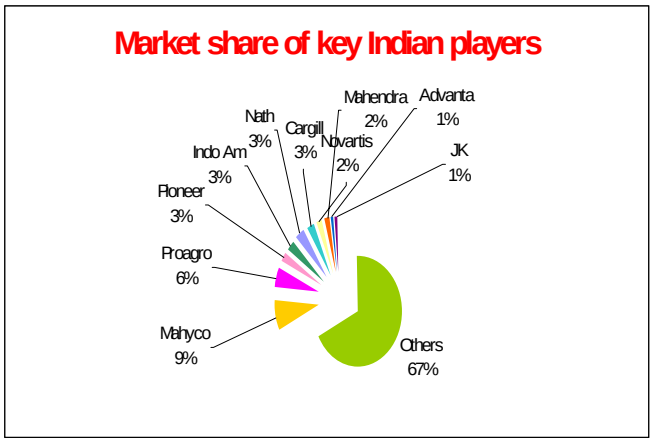
From the graphs above it can be seen that a large area in some crops is still being sown with farm-saved seed. Thus, private companies have good scope and opportunity to sell seeds.

In the public sector, there are 13 state seed corporations, 20 state seed certification agencies, and 96 state seed testing laboratories in addition to the National Seeds Corporation of India.

Table:4 Key Indian Seed Players

Company	Holding Structure	Turnover	Focus
Mahyco	Monsanto - 26%	1000	All crops
HLL	Unilever - 51%	700	All crops
Proagro	Aventis	600	All crops
Ankur		400	Cotton, vegetables
Namdhari Seeds		500	Vegetables
Advanta	Advanta & ITC (50% each)	380	Sunflower, corn, cotton, millets
Syngenta	Syngenta	350	Sunflower, cotton, vegetables
Indo-American	Family	300	Vegetables
Mahendra	Hicks Muse Tate & Furst	300	Millets, cotton
Spic-PHI	POC - 100%	250	Corn, millets
Cargill	Monsanto - 100%	200	Corn, sunflower
EID Parry	Family, Monsanto - 51%	10	Sunflower, cotton
Nath	Nath Group		Cotton, millets, corn
Total		9000	

Source: Industry sources, Rabobank International



Source: Industry sources, Rabobank International

The seed industry in India is changing rapidly in response to policies and technologies. Foreign companies have concentrated on maize and sunflower as their access to international germplasm gives them a competitive advantage. Cargil is now the largest supplier of maize seed while Advanta, Pro-Agro and Cargil dominate the sunflower market. Foreign companies have also concentrated on hybrid varieties, which now account for around 60 percent of the market.

Of late, some foreign companies are trying to takeover or get into alliances with Indian seed companies. For example, AgrEvo (part of Aventis Schering) has acquired the Delhi based ProAgro group of companies. The other trend seen in the Indian seed sector is the emphasis on transgenics. Monsanto has taken a 20 percent stake in Mahyco, Indian largest seed company and the two have set up an alliance to enter the transgenic seeds market. The department of Bio-technology has given permission to ProAgro, Monsanto-Mahyco and Rallis India to test genetically improved brassica, mustard, cotton and chilly plants. Added to this, various companies are setting up alliances for distribution of seeds. Cargil distributes its seeds through Rallis India. Unicorn Agrotech has taken up the contract production of seeds for foreign companies.

SOURCES OF SEEDS FOR FARMERS

In India and also most of the South Asian countries, a major portion of the seed used for cultivation is farm-saved seed. Only about 7% of wheat and 13% of Rice seed planted in India is certified seed. The farmers have a range of seed sources. They get seeds from the public sector seed companies, private seed companies and local level seed sources, etc.

The trends in the performance of private seed companies shows that the presence of hybrids have been increasing in different states of India.

SHARE OF PRIVATE HYBRIDS

Table:5 Number of Hybrids in major field crops marketed by private & public sector

Crop	Private Sector	Public Sector
Cotton	150	15
Maize	67	03
Bajra	60	06
Sorghum	41	05
Sunflower	35	06
Hybrid Rice	12	04

Source: Seed Association of India

VEGETABLE SEED BUSINESS

A study conducted for South-East Asia and South Asia (India, Philippines, Thailand, Indonesia and Vietnam) by AVRDC has highlighted the following scenario of vegetable seed business.

Cucurbitaceous crops are the most important in terms of sales in the regions surveyed, followed by solanaceous and root vegetables.

About 92% of the seed companies have established Research and Development (R&D) wings and the rest of the companies are in the planning phase. 36% of the companies have R&D budget below 5% of their total budget, 55% are in the range of 5 to 20% and only one company has a budget of above 20%. The allotted budget is mostly confined to developing new varieties and hybrids and local and international markets. 33% of the companies have outreach programs having substations or branches in foreign countries.

Major constraints faced by the vegetable seed industry.

Seed companies see weak R&D and opening up new markets as important and prominent constraints. Training of professionals, quality control, and application of new technology were also cited as important constraints whereas cost of seed production and labour were not cited as serious constraints (Table-6). Further, the technical services needed by vegetable seed companies as perceived by survey respondents is furnished below (Table-7).

Table:6 Constraints faced by seed companies, as perceived by a survey in South East and South Asia in order of importance

Constraint	No.of companies that responded
New variety/product development	11
Opening new markets	10
Training of professionals	8
Quality control	7
Application of new technology	6
Quality authentication	5
Shortage of manpower	5
High cost of seed production	4
Funding and credit	3
High cost of labourers	3
Other (availability of germplasm)	1

Table:7 Relative importance of technical services required by seed companies as perceived by survey respondents

Service	No. of companies that responded
Evaluation of disease resistance	10
Special seed production	8
Disease identification	8
Evaluation of insect resistance	8
Molecular tools	7
Identification of vegetable varieties	7
Purity tests of vegetable varieties	6
Plant nutrient analysis	6
Others [1]	4

[1] *Supply of germplasm, screening and improving cucurbit germplasm, and gene bank development.*

Most of the respondents chose evaluation of disease resistance as the most important technical service required by the seed industry.

Table:8 Major players in the vegetable seed business

Players	Sales (Rs. Crore)	Players	Sales (Rs. Crore)	Players	Sales (Rs. Crore)
Indo American	36	Novartis	15	Sungrow	12
Mahyco	24	Century	15	Nath	10
Namdhari	16	Pahuja	15	Others	85

EXPORT-- IMPORT SCENARIO OF INDIA

Currently, the total seed export by India stands at Rs.80 crores, which is negligible considering the volume of the international seed market.

Table:9 India's exports of seeds (Quantity: MT; Value: Rs. Lakhs)

Seeds of/for	1994-95		1995-96		1996-97		1997-98	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Potato	10,058.20	668.84	1,093.11	79.41	472.80	61.37	431.64	46.90
Wheat	-	-	7,180.00	655.71	53461.00	3279.15	-	-
Maize	698.00	47.02	2551.00	208.00	14852.80	1168.26	636.45	85.99
Sugar beet	-	-	-	-	8.00	3.60	5.50	0.69
Other beet	20.00	80.05	0.20	0.19	-	-	8.28	2.91
Forage plants	590.16	53.31	19.49	13.50	265.20	31.21	756.64	148.73
Herbaceous plants	65.15	36.53	42.72	219.92	36.00	237.12	124.16	198.53
Cabbage	35.35	15.79	128.07	50.06	43.90	15.48	29.65	21.71
Cauliflower	-	-	3.66	2.48	1.28	5.90	0.19	1.08
Onion	12.15	3.58	8.53	25.60	-	-	-	-
Pea	55.01	11.10	6.51	2.66	91.40	10.58	10.95	48.32
Radish	61.54	13.40	176.68	42.32	145.48	43.68	87.14	23.04
Pomegranate	7.37	4.98	4.93	4.43	8.81	5.74	14.43	10.75
Tomato	20.75	492.65	27.97	1016.73	33.12	1720.22	51.89	1889.33
Tamarind	2736.89	174.37	2718.20	189.58	2415.76	212.16	1174.36	138.95
Chilly	-	-	108.97	28.00	-	-	600.01	137.31
Misc. Vegetables	1944.75	778.31	3793.21	1366.84	1111.21	836.58	3454.84	4110.67
Misc. fruits	3.77	18.07	56.91	72.89	18.70	236.74	10.23	54.12
Other seeds	734.09	595.35	1502.62	1154.77	1029.80	1065.07	1491.22	1077.69
Total	**-**	**3193.34**	**-**	**5251.43**	**-**	**8942.87**	**-**	**7996.72**

Source: Agriculture Today, January, 2002

Table:10 India's Imports of Seeds (Quantity: MT; Value: Rs. Lakhs)

Seeds of/for	1994-95		1995-96		1996-97		1997-98	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Oil palm	-	112.94	9.00	127.94	6.72	164.78	64.92	45.38
Sugar beet	-	-	8.25	21.51	110.00	35.04	-	-
Other beet	-	-	2.52	9.57	-	-	0.79	3.91
Forage plants	23.81	10.68	111.00	40.15	528.60	168.48	1.92	2.43
Herbaceous plants	1.15	19.02	2.94	61.81	26.70	18.35	4.68	34.06
Cabbage	16.20	294.87	13.98	318.96	11.00	176.69	22.23	763.24
Cauliflower	8.16	60.38	2.25	21.31	2.60	25.11	1.64	108.83
Onion	0.02	0.22	0.99	8.40	2.30	24.09	3.22	40.80
Pea	0.23	0.32	1.98	2.53	-	-	-	-
Radish	27.83	41.01	20.65	26.26	27.60	17.56	0.05	0.06
Pomegranate	-	-	-	-	4.00	0.41	171.21	19.32
Tomato	0.31	21.88	0.34	19.49	1.50	67.07	1.10	94.11
Misc. Vegetables	210.47	1493.33	258.63	1253.37	148.50	1070.53	179.15	1582.26
Misc. fruits	0.80	3.42	13.65	59.66	0.60	6.09	15.39	142.53
Other seeds	10.95	146.83	29.76	152.11	11.90	212.25	19.98	201.05
Total	-	2091.97	-	2123.07	-	1986.47	-	3037.98

Source: Agriculture Today, January 2002

DEMAND FORECASTING IN SEEDS

Inadequate estimation of demand and the consequences of over production or under production can cause serious financial consequences for a seed company. Too many carryovers and stock write-offs will prove to be expensive, while lack of seed means a loss of revenue and a source of frustration for the sales force and the dealer network.

This combination of special features in the seed industry makes the accurate assessment of demand even more critical. Some of these features are:

- Longer period of time for the development of new products from breeding programmes
- Seasonality of production
- Production subject to variables like agro climatic conditions outside the control of management
- Statutory controls and quality standards
- Existence of a generation system - whereby the production in one year is the progenitor of the next
- Limited shelf life and loss of germination
- High volume: Low value ratio of some seed crops like cereals makes long distance transport and long-term storage unattractive.x

In demand forecasting, the first step is to calculate the existing requirement multiplied by percent bought seed, which is the amount of commercial seed purchased by farmers.

In calculating seed requirement, seed multiplication rates must be taken into account, i.e., the difference between a crop grown for grain or forage, the difference between irrigated and dry land, the difference between a crop, which is sown directly or transplanted. It is also important to define the various categories of seed that exists in the market, as understanding of these segments will assist in the assessment of demand.

Table:11 Seed multiplication ratio (MR) of various crops

CROPS	SEED RATE (kg/ac)	MULTIPLICATION RATIO
CEREALS & MILLETS		
WHEAT	40	1:20
PADDY	20-30	1:80
MAIZE (F) 4 (M) 2	6	1:100 (HYBRID)
		1:80 (VARIETIES)
SORGHUM (F) 3.5 kg (M) 1.5 kg	5	1:100
BAJRA (f) 1.5 KG (M) 0.5 kg	1.5	1:200
Ragi	5	1:80
PULSES		
BENGAL GRAM	6	1:10
URAD (BLACKGRAM)	6	1:40
MOONG (GREEN GRAM)	6	1:40
ARHAR (RED GRAM)	4	1:100
LENTIL	16	1:30
PEAS	24	1:40
HORSE GRAM	5	1:40
MOTH BEAN	6	1:40
OIL SEEDS		
GROUNDNUT	60-80	1:8
RAPE AND MUSTARD	2	1:100
SOYABEAN	25	1:16
SESAME	6	1:250
SAFFLOWER	5	1:60
CASTOR (F) 3.5 kg (M) 1.5 kg	2.5	1:60
CASTOR VARIETIES	2.5	1:60
LINSEED	10	1:50
FIBRES		
COTTON VARIETIES	2	1:50
COTTON HYBRIDS (Delinted Fuzzy)	0.6	1:250
COTTON HYBRID(Linted)	0.7	1:300
JUTE	1	1:100
MESTA	6	1:40
SUNHEMP	10	1:30
FORAGE		
BERSEEM	8	1:10
LUCERN	4	1:25
OATS	25	1:15
FORAGE SORGHUM	2	1:100
TUBER CROP		
POTATO	600 gms	1:4
VEGETABLES		
BHINDI	1-2	
CHILLIES	0.5 kg	

Table:12 Seed Replacement Rate of major vegetables

Crop	SRR (%)
Brinjal	63.4
Cabbage	100.0
Cauliflower	86.4
Chilli	83.7
Gourds	73.5
Melons	89.2
Okra	92.4
Tomato	99.3
Beans	62.2
Onion	87.3
Peas	93.5
Others	72.6

Source: Agriculture Today, January 2002

FACTORS WHICH AFFECT DEMAND

It is important to distinguish between actual demand, perceived demand and what the government expects the farmers to buy. The total amount of certified or labeled seed sold may be quite a small proportion of the total requirement.

Many factors have to be considered while assessing and forecasting demand. Some of these are:

- Cropping pattern and intensity
- Type of seed used
- Climate
- Demand for crop products
- Market scenario
- Disposable farm income
- Rate or level of adoption of new technology
- Government policy
- Crop cycles
- Habits and tradition
- Product performance
- Competitiveness
- Price
- Promotion

The most important factors that need to be taken into account when an individual company or organization is estimating the market share that may be gained by its own products are product performance, competitive positioning, price and promotion. This will form the basis of sales forecasting and production planning.

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