

C H A P T E R - 2

PROFILE OF INDIAN PLASTIC INDUSTRY

CHAPTER - 2.

PROFILE OF INDIAN PLASTIC INDUSTRY

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C H A P T E R - 2

PROFILE OF INDIAN PLASTIC INDUSTRY

2.1 INTRODUCTION

The plastic industry as the most important segment of the petrochemicals industry is an established fact today. Plastics have created a tremendous impact on human society and it would perhaps be most appropriate to say that we are really living in a plastics age today. It is generally not known, but it is a fact that well over 70 per cent organic material end up in polymeric substances, plastics being the major segment.

No wonder then that globally these materials are creating a revolution and expanding rapidly. We, in India, also have come a long way in a relatively short span of time. The plastics industry in India has shown a growth rate of around 15 percent. This perhaps would have been higher but for factors such as capacity constraints, non availability of feed stocks and high fiscal levies dominating the scene. The current scenario, however, is under going a rapid change and the recent liberalisation moves and opening up of the economy envisaged by the Government should certainly provide a boost to the growth

of this sector as it is directly linked with the growth of the petrochemical sector where the Government is expecting an additional investment of Rs.8,000 crores in next four years.

2.2 PLASTICS IN INDIA

In India the consumption of plastics has been extremely limited in comparison to the western world. This has resulted to some extent in the misconception in the minds of the policy planners and decision makers in the Government, who initially symbolised newness in plastics with only modern living luxury. However, with conscious efforts by the industry in India and a far greater appreciation of the implication by intelligent policy planners at the centre during the last two or three years plastics has been given the important status of thrust area in the national plans that are being formulated. It has therefore been finally realised by at least some, though not all, that plastics can and should play an important role in improving the common man's life and only if we exploit the several valuable properties of this raw material, can we as a nation keep pace with industrial development taking place worldwide. In the coming years in India this should be the fastest growing sector and industries connected with plastics will be seen in the forefront.

During the early stages of our economic development most of the plastics were imported into India, however between 1966 and 1968 indigenous capacities were established by Union Carbide, NOCIL and PTL and this automatically meant growth in consumption; in 1978 IPCL's entry gave this sector another big boost.

Today there would be over twenty units engaged in the production of various plastics raw materials in India. The major ones being NOCIL, IPCL, PIL, POLYCHEM, Union Carbide, Century Enka, Garware Nylon, Indian Explosives, Hindustan Polymers, Shree Ram Plastics and Resins, ABS Plastics, Gujarat State Fertilizers Corporation, Nuchem, Bakelite Hylum, Hindustan Fluorocarbon, Chem Plast etc.

Very broadly speaking the largest consumption of plastics has been in Commodity Thermoplastics followed by Engineering Thermoplastics and Thermosets. In 1988-89 out of a total requirement of around 7 lacs tonnes of raw materials, the plastic industry is importing 3 to 3.5 lacs tonnes. However, by early 1990 with the commissioning of the Maharashtra Gas Cracker, Complex at Nagothane a substantial increase in indigenous production is envisaged which would mean a slightly reduced dependence on imports though it is clear that imports will

continue till 2000 AD. During the sixth five year plan the compound annual growth rate for plastics was 12 per cent for Thermoplastics, 14 per cent for Engineering plastics and 2 per cent for Thermosets. It is felt by the year 2000 AD the national requirements of plastics would be in the range of 25 lacs tonnes.

2.3 PRODUCTION OF RAW MATERIALS

During the early stages of our economic development most of the plastics were imported into India, however between 1966 and 1968 indigenous capacities were established by Union Carbide, NOCIL and PTL. In 1978 IPCL's entry gave this sector another big boost. In India 80 per cent of the requirements of raw materials and almost all types of plastic machinery required for the industry are indigenously available.

According to the data given in TABLE 2.1 and in TABLE 2.2 it can be observed that imports of raw materials are on the rise to meet the production requirements². The manufacture of both low density polyethylene and high density polyethylene and their imports are quite significant. Another material which had a considerable share in the total imports is PVC Resin.

TABLE 2.1 : PRODUCTION OF RAW MATERIALS

(In tonnes)

Item	Installed Capacity	P R O D U C T I O N		
		1980-81	1981-82	1983-84 (Apr-Dec)
Low density Polyethylene	1,11,000	87,154	94,293	69,438
High density Polyethylene	30,000	23,293	31,732	26,406
Polypropylene	30,000	16,729	20,644	16,755
Polyvinyl Chloride resin (PVC)	64,700	42,050	37,037	45,402
Polystyrene	23,500	10,205	7,642	11,179
Phenol Formaldehyde resin & moulding powder	16,500	4,794	4,556	3,464
Melamine Moulding Powder	1,500	214	328	330

SOURCE :

Weekly Review, Bank of Baroda, Volume 23, No.20, May 1985,
P.2

TABLE 2.2 : IMPORTS OF RAW MATERIALS

(Rs. in lacs)

Items	1979-80	1980-81	1981-82
P.F.Moulding Powder	05	12	34
U.F.Moulding Powder	02	-	04
Polythylene L.D.	1,291	173	314
Polythylene H.D.	1,378	2,435	2,785
Polystyrene Moulding Powder	63	28	32
PVC Resin	340	2460	4208
C.A. Moulding Powder	14	05	06
C.A.B.Moulding Powder	-	19	N.A.
Polypropylene	-	75	N.A.
TOTAL	3,093	5,207	7,376

SOURCE :

Weekly Review, Bank of Baroda, Volume 23, No.20, May 1985, P.2.

Domestic production of PVC Resin was 45,402 tonnes in 1983 and its share in total raw material production was the second highest. However an expected increase in domestic production of raw materials during this decade should ease the raw material scarcity.

2.4 CAPACITY AND PRODUCTION OF THERMOPLASTICS

Among the thermoplastics materials, those which are widely used are LDPE, HDPE, PP, PVC and PS. The TABLE 2.3 shows the capacity and production of thermoplastics.³

TABLE 2.3 : PRODUCTION & CAPACITY OF THERMO PLASTICS
(000 tonnes)

	90-91 capa- city	90-91 Produ- ction	91-92 Capa- city	91-92 Produ- ction	96-97 Proje- cted Capa- city	96-97 Proje- cted Produ- ction
LD Polyeth- ylene	192	95	192	120	192	180
HD Polyeth- ylene	185	40	395	44	680	406
Polyvinyl Chloride	158	140	258	170	542	450
Polypro- pylene	115	45	115	64	215	155
Polysty- rene	28	25	34	20	160	110

SOURCE :

Eighth Five Year Plan/Facts For You, Market Survey Jan.93,
P.36

From the above TABLE 2.3 it is observed that, many of the units are not able to utilise full capacity because of the scarcity of raw materials. If the supply of raw materials could be accelerated, production of plastic goods would rise manifold. This will naturally lead to increased employment opportunities.

The plastic industry in India has a bright future. Efforts are being made to make the availability of raw materials easy. But no assurance can be held on prices of the raw materials. This is because of the prices of raw materials are linked with the prices of petrochemicals which are dependent upon the prices of crude oil having a tendency to fluctuate violently.

However by early 1990 with the commissioning of the Maharashtra Gas Cracker Complex at Nagothane a substantial increase in indigenous production is envisaged which would mean a slightly reduced dependence on imports though it is imports will continue till 2000 AD.

During the sixth five year plan the compound annual growth rate for plastics was 12 percent for Thermoplastics, 14 percent for Engineering plastics and 2 percent for Thermosets. It is felt by the year 2000 A.D.

the national requirements of plastics would be in the range of 25 lacs tonnes.

2.5 PRODUCTION, CONSUMPTION AND FOREIGN TRADE IN
SELECTED COUNTRIES

India's production, consumption, import and export of plastics as compared to other countries has shown in TABLE 2.4.

It is observed from the TABLE 2.4 in developed countries like USA, Japan, Germany, France, Italy etc. production of plastics is very high⁴. The export as observed from TABLE 2.4 is also considerable as compared to their import in 1989 and 1991. The USA, the total consumption in 1991 is 26,539 thousand tonnes; where as, in Japan the total consumption in 1991 is 11,637 thousand tonnes but in India it was only 967 thousand tonnes in 1991. As compared to the advanced countries the production of plastics in India is also very low, 425,000 tonnes in 1991; where as, in USA it is 28,492 thousand tonnes in 1991.

The per capita consumption in Germany in 1989 was 131 kgs where as in India it was only 0.8 kgs. In 1991 the per capita consumption in USA was 102 kgs. where as in India it was 1.1kg.

TABLE 2.4 PRODUCTION - FOREIGN TRADE - CONSUMPTION IN SELECTED COUNTRIES

Countries	Production ('000 tonnes)		Import ('000 tonnes)		Export ('000 tonnes)		Consumption ('000 tonnes)		Per Capita Consumption inkg.	
	1989	1991	1989	1991	1989	1991	1989	1991	1989	1991
USA	26,556	28,492	667	888	2,666	3,847	24,557	26,539	99	102
Japan	11,912	12,802	576	649	1,436	1,814	11,052	11,637	90	94
Germany	9,078	8,996	3,837	4,673	4,814	5,160	8,101	8,509	131	133
France	4,259	4,399	2,079	2,433	2,727	3,100	3,611	3,732	64	66
Italy	2,910	3,020	1,985	2,310	895	1,010	4,000	4,230	70	75
Netherlands	3,265	3,853	1,202	0	3,580	0	1,120	1,118	75	79
India	350	425	335	542	-	-	685	967	0.8	1.1

* Production figures include only PE and LD

SOURCE : Facts For You Jan.93, P. 37

Plastic industry in India depends upon the imports to a significant extent. While export earnings of plastics are rather meagre. Now the Indian manufacturers of plastic goods have acquired expertise to produce the finest plastic goods, the possibilities of boosting exports have risen manifold. Non resident Indians who visit this country off and on are fascinated by the quality of the Indian plastic goods as well as their low prices.

2.6 POSITION OF INDIA VISA-VIS OTHER COUNTRIES

The position of India as regards the employment, number of firms engaged and turnover is far behind as compared to other advanced countries as observed from the

TABLE 2.5. POSITION OF INDIA VISA-VIS OTHER COUNTRIES

	No. of firms	Employees	Turn-over Million US \$	Percentage change in turn.	Turnover per empl- oyee US \$
USA	12,000	5,95,300	72,758	+1.3	1,22,200
JAPAN	19,076	4,25,100	72,801	+3.6	1,71,300
GERMANY	2,457	3,01,000	36,842	+10.8	1,22,400
FRANCE	4,130	1,36,600	14,760	+6.5	1,16,200
ITALY	5,100	1,18,000	13,773	-1.8	1,16,700
INDIA	18,000	1,65,000	2,466	+35.1	14,900

SOURCE :

IPAD

In advanced countries like USA, Japan and Germany the percentage change in turnover is very low⁵. The turnover per employee in Japan is 1,71,300, US\$ where as in India it is only 14,900 US\$. It represents that the turnover per employee in India is very low as compared to other advanced countries.

The plastic industry in India made rapid progress in recent years. At present there are 18,000 viable units created employment for 1,65,000 workers.

In the developed countries the level of saturation has reached in respect of plastic consumption. Therefore much of the progress of the plastic industry in the near future is likely to take place in the developing countries like India.

2.7 CONSUMPTION OF PLASTICS

The consumption of plastics in India as regards the Agricultural and water management sector, teletronics sector and Building and Construction sector has shown in TABLE 2.6.

TABLE 2.6 SECTORAL CONSUMPTION OF PLASTICS

(in tonnes)

Sector	1984-85	1989-90
1) <u>Agricultural and Water Management</u>		
a) Canals and distribution lining	2,300	18,000
b) Foodgrain storage covers	3,500	8,400
c) Irrigation and Water Management	25,000	49,000
d) Mulching	300	2,500
e) Seed/Produce/ Fertiliser packaging	54,900	78,800
f) Nursery Bags	9,900	15,600
g) Dunnage/Silage	1,000	1,700
h) Biogas Silos/Plants/Pipes	1,600	3,400
i) Fishing Nets	1,500	2,600
TOTAL	1,00,000	1,80,000
2) <u>Teletronics</u>		
a) Consumer electronics	16,000	64,000
b) Communication equipments	8,000	33,000
c) Broadcasting Equipment	-	1,500
d) Defence, Aerospace, Computers, Office Equipments, Control Instruments and Industrial Electronics	1,000	44,500
TOTAL	25,000	1,43,000
3) <u>Building and Construction</u>		
a) PVC	63,135	1,68,120
b) LDPE	2,530	11,650
c) MDPE	9,000	18,000
d) GRP	120	240
e) Phenolic/PP	760	1,350
f) HIPS/PS	280	1,120
g) Others	295	950
TOTAL	76,120	2,01,430

SOURCE 1. Facts For You, Market Survey, Feb.1991, P.26
2. The Hindu Survey of Indian Industry, 1989, P.77

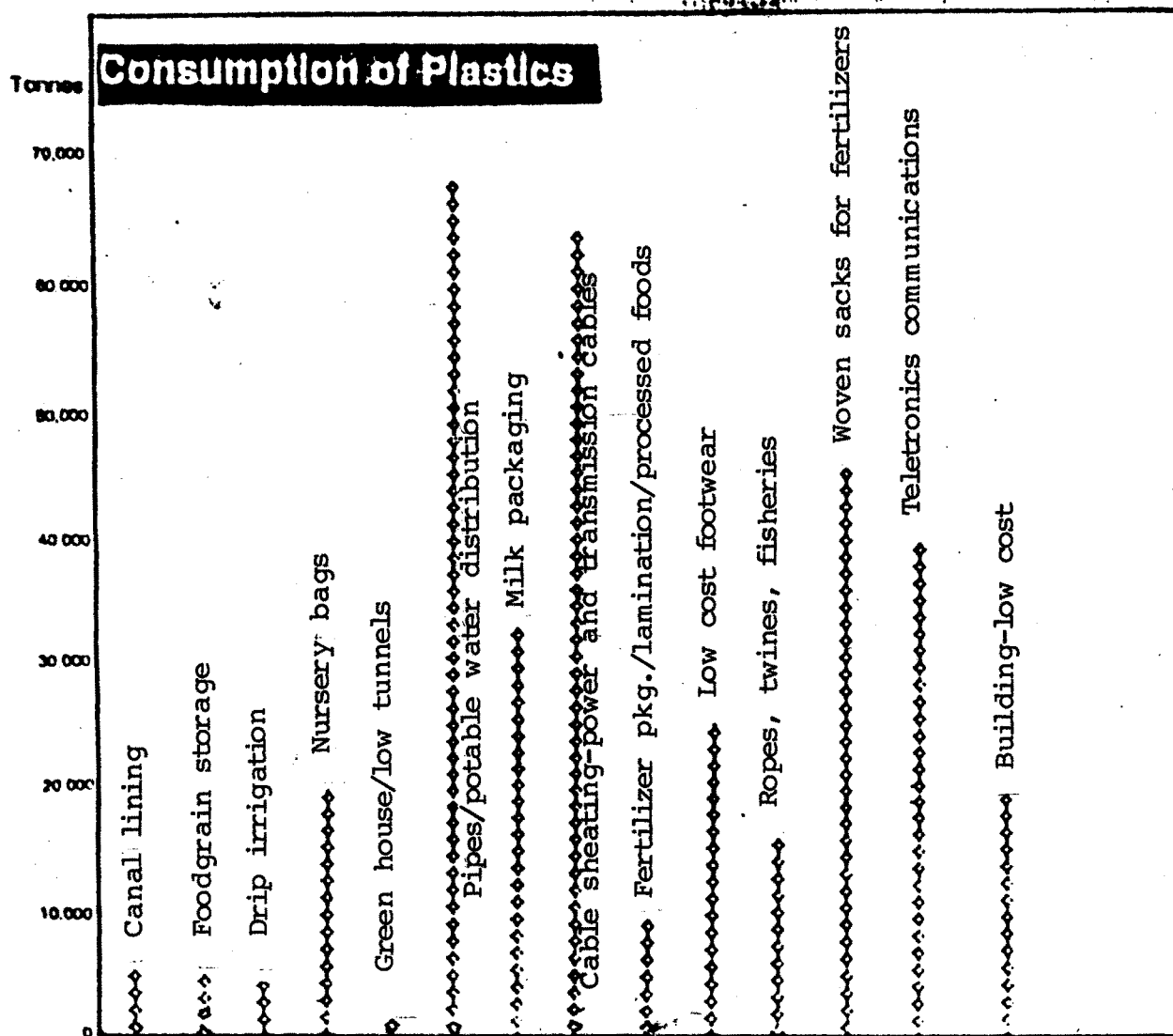
This table represents the comparative sectoral consumption in the above mentioned sectors in 1984-85 and in 1989-90. The total consumption of plastics has increased to 5,24,430 tonnes in 1989-90 as compared to the total consumption of 2,01,120 tonnes in 1984-85. As regards the consumption of plastics in Agricultural and water management sector it is increased from 1,00,000 tonnes in 1984-85 to 1,80,000 tonnes in 1989-90. The annual growth rate of consumption regarding this sector is 15 percent⁶.

In Teletronics sector, the consumption of plastics has increased considerably from 25,000 tonnes in 1984-85 to 1,43,000 tonnes in 1989-90. It means the consumption in this sector has increased more than five times in six years.

The consumption of plastics in Building and construction sector from 76,120 tonnes in 1984-85 to 2,01,430 tonnes in 1989-90. The above TABLE 2.6 indicates that this sector is one of the largest end-users of plastics and can play a dominant role in future.

The consumption of plastics is the largest for pipes followed by cables and sacks for fertilisers and telecommunications⁷. The consumption of plastics in various sectors is shown in separate graph 2.1.

GRAPH 2.1 CONSUMPTION OF PLASTICS



All these four users consume more than 60 per cent of the total plastic consumed in this country. Many other users of plastics have emerged in recent years as shown in the graph. It is a pity that many units set up to fabricate plastic items are currently using only a part of the available capacity. If the raw materials could be provided to all these units, the production of plastic items would shoot up, thus offering increased employment opportunities and earning valuable foreign exchange through exports. An unofficial estimate puts the annual size of exports at more than Rs.4,000 million.

It is therefore quite clear that if the raw materials are available easily and at reasonable prices in India automatically several new applications for plastics will be developed, the variety will widen and also larger outputs keep the unit cost of production lower. These applications will directly and indirectly increased the consumption in various sectors.

PER CAPITA CONSUMPTION

"The per capita consumption of plastics is 68 kgs in West Germany, 53 kgs, in USA, 35 kgs in France and 33 kgs in U.K. and even in developing country like South Korea is 8.5 kgs. But in India, due to extremely high

cost of resins the per capita consumption of plastics is very low at 0.8 kg. as against the world average of 11 kgs⁸".

The Jha Committee observed that high prices and levies have inhibited the demand for plastics goods in India which affects the per capita consumption. In case of many plastic items as much as 70 per cent of the selling price is accounted for by levies alone. The committee has suggested that the consumption of plastic goods is elastic and hence a reduction in duty should increase demand which automatically increase the consumption, with no loss in total revenue.

2.8 DEMAND ESTIMATES FOR MAJOR PLASTIC RAW MATERIALS IN INDIA

The growth in plastics has been spectacular all over the world in the last three decades. This is due partly to the population growth and partly to improved standards of living. Plastics can be divided into two categories - commodity plastics and engineering plastics. Commodity plastics are mainly used in packaging applications, although they also find application in other fields such as irrigation in the form of film/pipe, consumer items like toys, chappals and electrical cable insulation. The demand estimates for major plastic raw materials⁹ are given in TABLE 2.7.

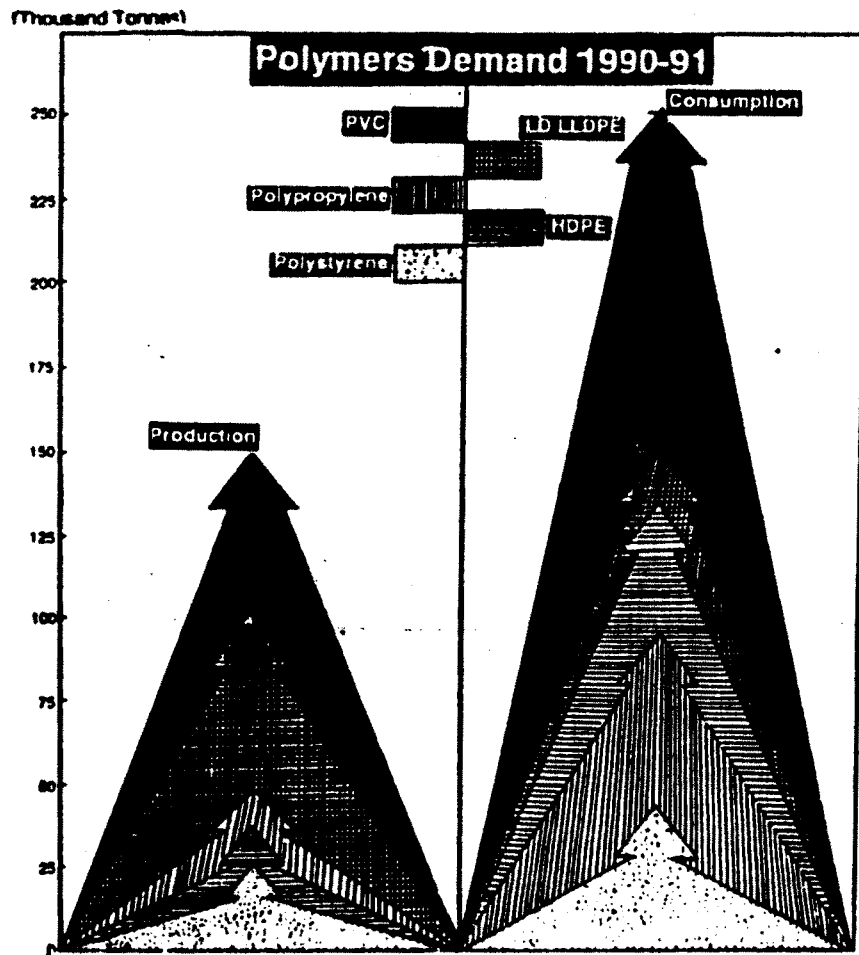
TABLE 2.7 DEMAND ESTIMATES FOR MAJOR PLASTIC RAW MATERIALS IN INDIA
(Figures in '000 Tonnes per annum)

Resin	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1999-2000
LDPE/LLDPE	245	292	340	387	435	482	708
HDPE	190	228	265	303	340	378	555
PP	77	119	161	202	244	286	420
PVC	267	311	354	398	441	485	713
PS	38	47	56	64	73	82	120
TOTAL	817	997	1,176	1,354	1,533	1,713	2,516

SOURCE :

Satya Sundaram, I, Facts For You, May - 1989, Market Survey, P.19

GRAPH 2.2 : POLYMERS DEMAND



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Engineering plastics have special qualities and in many places, have replaced metals. These are used in transportation, telecommunication and electronics. The rise in the consumption of commodity plastics like LDPE/LLDPE, HDPE, Polypropylene, PVC and Polystyrene has been spectacular. The polymers demand for various types is pictorially represented in graph 2.2.

The demand for plastics has been rising sharply in recent years and the processing industry could achieve an annual growth rate of 12 percent. The present average investment in fixed assets per unit in India, is about Rs.2,50,000 and it is estimated that an investment of Rs.1,00,000 would provide employment to 62 persons, besides indirect employment opportunities in the secondary and tertiary sectors. The plastic industry is no doubt labour intensive, but it is also technically advanced.

The plastic industry is also helping the agricultural sector in boosting up productivity by ensuring conservation of energy, materials and water resources. Some canals are lined up with LDPE films to reduce seepage losses. LDPE pouches are being used to supply milk to the consumers daily.

About 18 million tonnes of foodgrains are being protected during transit. The demand for PVC films used for lining of water storage structure is likely to go up from 2,000 tonnes in 1987 to 18,000 tonnes in 1990.

According to the National Committee on Perspective Planning for Petrochemicals under the Chairmanship of D.V. Kapoor, the demand for plastics will grow to 2.6 million tonnes by 2000 AD against 5,00,000 tonnes at present. The Committee opined that minimum economic capacities of raw material plants should be periodically reviewed in the light of technological developments.

There is likely to be spurt in demand for plastics in the coming years from the agricultural sector. The requirement of plastic film for canals and field channels could go up substantially because of continuing water scarcity in many parts of the country.

It is estimated that lining of canals and field channels using plastic films will result in saving of Rs.13,000 million in the Seventh Plan. It can also generate an additional irrigation potential of 0.4 million hectares. Consumption of plastic films for canal lining was 2,000 tonnes in 1985-86 and it is expected to go up to 18,000 tonnes by 1989-90.

The packing sector is also depending more and more on plastic. Additional requirement of plastic materials for packaging of agro-based and industrial goods by 1989-90 is estimated at 50,400 tonnes in addition to 47,000 tonnes required only for milk packaging.

In 1986-87, in the industrial sector, consumption of plastics was 41 000 tonnes for electrical cables, and it is expected to go up to 1,76,000 tonnes by 2000 AD. The demand for plastic from the electronics and telecommunications sector is bound to increase in the coming years.

2.9 PROJECTED DEMAND/SUPPLY GAP FOR PLASTIC RAW MATERIALS IN INDIA

Because of the increasing demand for plastics in various sectors there is always gap in demand and supply.¹⁰

The projected Demand and Supply gap is shown in TABLE 2.8.

TABLE 2.8 PROJECTED DEMAND/SUPPLY GAP FOR PLASTIC RAW MATERIALS IN INDIA
(Figures in '000 Tonnes per annum)

Resin	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95	1999-2000
LDPE/LLDPE	96	127	167	214	262	309	535
HDPE	112	139	170	208	197	219	388
PP	+ 9 *	21	39	74	113	155	289
PVC	105	149	192	236	279	323	551
PS	16	25	34	42	39	44	80
TOTAL GAP	329	461	602	774	890	1050	1843

* Capacity more than demand.

SOURCE :

Facts For You, May 1989, Market Survey, P.20



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From the TABLE 2.8 it is observed that the gap in demand and supply will increasing sharply in various types of plastics raw materials.

In view of the demand supply gap and future requirements, the government has started issuing licences for producing various types of polymers. Most of these plants are in different stages of implementation and are likely to go on stream in four to five years.

All the scarce inputs can be imported under OGL, but the processing units are unable to take advantage of this concession as import duty rates continue to be prohibitive. There is need for reducing customs duty on LDPE, Polypropylene, and PVC resin.

The Governmental restrictions on imports of raw materials and machinery, coupled with high excise rates and import duties have affected the production and growth of industry. The excise duty rates range from 20 to 30 percent on most of the raw materials.

The processing industry is facing it's worst crisis with an acute scarcity of major plastics like low density polyethylene high density polyethylene. PVC, polypropylene, and polystyrene. Almost 55 percent of the

processing industry's requirement of these materials is at present, met by imports.

So far as the import content of plastic is concerned about 40 percent of the total consumption in India is being imported. If in future, the projected gap in demand and supply is bridged by imports, the import content would increase to 60 percent by the year 1994-95 and 75 percent by 1999-2000. India would need to spend foreign exchange worth Rs.15 000 million in 1994-95 and Rs.27 000 million in 1999-2000 on plastic imports.

About 10,000 units are likely to face closure for want of raw materials and the high cost of production. In 1987, the shortfall in demand was placed at around 3,36,000 tonnes.

The raw material shortage is partly due to import restrictions & partly due to our inability to augment domestic production capacity as petrochemical complexes are capital intensive.

2.10 PRICE AN IMPORTANT FACTOR FOR INDIA

One of the principle factors which could affect the demand and consumption of plastics in India is the price of the raw materials to the processor and ultimately

the end user of plastic products in India are the high cost of Naptha to the operation of these complexies, the high import duty on capital excise duty on the plastic raw material. To some extent the administred prices of inputs in India have also been thereby affecting the demand and application. A corelation of price to demand exists, as to a very large extent plastics has been used as a substitute material in India, a steep rise in prices of polymers has resulted in reverse effect often with end users switching to traditional materials like metal, glass and paper despite functional inferiorities. Economist in the industrialised nations have developed economic growth indices and parameters linked to the consumption of polymers. This should help understand how closely linked industrial development is to the use of plastics today and the need of promoting this sector rapidly as leads to all round growth in the country.

2.11 PETROCHEMICALS - IMPORTANT RAW MATERIALS

Although the plastics processing in India has suffered due to high prices in 1988-89 and uncertain supply of polymers, there seems to be a ray of hope on the horizon looking at the innumerable applications being made by each and every leading industry house for licence to set up petrochemical complexes. The performances of

those already in the field of manufacturer of polymers in India such as IPCL, PIL, NOCIL and others have shown consistently high returns on investments and excellent operating results for their shareholders. During early 1989, the applications pending for installation of capacity to produce ethylene total upto 2.7 millions tonnes per year from a host of industrial houses perhaps all these applications may not finally set up to the complexes however, most of them at the moment appear to be very eagerly persuing the ministries to permit them to proceed further with their projects.

From the point of view of the processing industry, it is an established fact that although time and again raw material shortages have affected the working of the processing sectors, whenever raw material has been available in abundance the growth has been remarkable and this is what the plastic processing sector in India, the equipment and ancilliary suppliers would all hope for in the coming years.

Without taking away the due credit for good commercial management of polymers producing units in India it is obvious that if not for the huge tariff walls of over 100 per cent import duties and shortfall of indigenous capacities, none of these units would ever have

have achieved the returns they did these last few years in India since the high ROI has not been due to exceptional technologies or their own R & D skills but advalorem duties in India assured Indian petrochem units safe returns at any cost for whatever they could produce in India.

2.12 SLUGGISH EXPORTS - ROOM FOR NEW LONG TERM PLANS
AND DYNAMISM

On the exports front although comparisons have been made about the large volume of raw materials imports againsts the direct exports of Rs.120 crores of plastic to understand that the western countries who export polyerms have been doing so now a days at 20 percent to 25 percent cent to 25 per cent higher price to us. There price of polymers supplied in their own country for producing plastic production is therefore much lower. This in fact has made it all the more difficult for exporters of plastic products from India is a net importer of plastic raw materials and we have not added capacity for ten years.

The installed plants are processing plastics, barring a few such as those producing polyester, multilayer and BOPP films, PVC pipes and woven sacks, a

majority of all others would be considered small if compared in the world market. This has obviously meant a disadvantage to the Indian exporter as the per unit cost of production tends to be higher for Indian processors. Never the less efforts are being made to explore possibilities of exporting plastic products with larger labour contents which would be the right approach for the immediate future and a centralised agency coordinated by IPCL is working in this front.

It would be more prudent to look at exports made by the plastic industry on a much wider basis as indirectly a large amount of plastic products do get exported forming an intrinsic part of another commodity. When engineering equipments and machines are exported, vehicles such as bicycles and two wheelers are shipped, foodgrains or chemicals or garments are exported, all these have made use of plastic components or packaging which do not appear as a credit to plastic exports. If the large targets set for exports of processed foods are to be met, there is no alternative to plastics. The entire western world is shifting in almost all new retail packs to various sophisticated packagings from plastics as there are the most acceptable and economically viable packagings for foods which need to retain their shelf life at the same time be attractive and convenient to

handle in the shops and in the houses.

It is therefore quite clear that if the raw materials are available easily and at reasonable prices in India, automatically several new application for plastics will be developed the variety will widen and also the larger outputs keep the unit cost of production lower. These applications will directly and indirectly help in the national effort in several of its products to the developed nations as they need export several of its products to the developed countries as they need them, packed in the form that is acceptable to their economy. If these indirect and direct exports of plastics are taken into account it is quite possible that industry could within the next five years contributed towards exports of over Rs.500 crores and thereby make a wide variety of Indian products available to importers spread in different parts of the world.

2.13 TECHNOLOGY FRONT : MACHINES, MOULDS AND ANCILLARIES

During the last two years due to the shortage of materials and the higher prices of polymers there has been a slow down in the process of modernisation amongst processors. It is felt that this equipment sector would also get further impetus if the materials front was to be

looked after better. Several major producers of machinery have shown willingness to transfer technology and tie up with Indian machinery manufactures realising the large population of the subcontinent and growth potential of the Indian technicians and engineers are equal to the best in the world and can absorb technology from the advanced countries.

With the advantage of a lower labour cost in India it is felt several machines can be produced with tie-ups and with know-how-from the developed nations to India, this could also be a sound base for supplying processing machines to neighbouring countries and the East block, the strength of the Indian engineering industry would help in this.

The Japanese specialists team visiting India for a technical assessment of the capabilities of the Indian plastics industry pointed out that Indian plastic processors need to pay far greater attention to proper die designing and selection of correct metals for moulds and accessories to save on wastage of resins, optimising on production cycle times and cut down on rejected or defective articles produced. A substantial scope for savings in production costs exists in India which could also make Indian plastic products more competitive.

Improving mould making skills and productivity of the moulds and tools calls for the mould makers and processors to sit down and work together and there exists considerable room for closer cooperation in this could mean a new chapter for the industry.

2.14 PROBLEMS OF PLASTIC INDUSTRY

The plastic industry in India face various problems on all fronts. These are listed below.

- 1) The processors in India are facing the problem of increasing level of prices of the raw materials like naphtha and petrochemicals.
- 2) There is high import duty on capital equipment and heavy excise duty on plastic raw materials.
- 3) Since more than 90 percent of the plastic units are in SSSI sector, the technology is either traditional or outdated. This results in dis-economies of scale of operation.
- 4) The recent imposition of a small anti-dumping duty on PVC resin has increased further the domestic prices of plastics.
- 5) Chances of pollution are high during the processing stage by small-scale manufacturers. The case is not taken by small-scale manufacturers because they have no state-of-the

art technology and pollution control equipment at their disposal.

- 6) Further the problem of post consumption waste as severely faced by the developed countries today, may be a big threat in future for India.
- 7) The quality of plastics produced in India are not upto the mark in contrast to international standards.
- 8) The plastic industry lacks proper infrastructure facilities.
- 9) In the area of fiscal measures, there has been lack of Government policy direction and clear cut guidelines are missing.
- 10) Government encourages greater use of metal pipes and irrigation system, use of wooden crates for packing horticultural produce through subsidies.
- 11) The Jute Packaging Materials' Act (JPMA) imposed artificial restrictions on the growth of synthetic woven sack industry in order to protect the interest of jute.
- 12) Imposition of multi-stage excise duty in production of plastic goods has affected the growth of several small and medium units.
- 13) Short-sighted approach of state government particularly in the areas of sales-tax, octroi and other levies has threatened cost benefits analysis of plastic manufacturers.

- 14) Lack of specific R & D and technology policy in respect of plastic raw materials and products have come in the way of new plastic products.

2.15 REQUIREMENTS OF GROWTH AND DEVELOPMENT OF PLASTICS IN INDIA

In view of the bright prospects of plastics in India the basic necessities required for successful development and growth can be ensured from the following points of view.

1) MATERIALS

New and improved materials and processes are the key to innovation in all the branches of manufacturing industry and they are essential to industrial prosperity.

Where as there is a fairly established base for plastics like Polythylene, PVC, Polypropylene, Polystrene based on boughtout technology with indigeneous R & D efforts, the industry need to lay emphasis on engineering and performance plastics. The specific areas such as composites, blends, and alloys need special attention for development of high-tech application areas.

2) MANPOWER

India is one of the richest countries in the world in terms of entrepreneurial manpower. The Indian

managers and marketing men know how to sell but they seem to have not capitalised on this fully. This may be due to the following reasons.

- a) Production of goods of uncertain quality as a result of obsolete technology.
- b) Inadequate training facilities to create skilled manpower.
- c) Inability to maintain delivery schedules as a result of indefinite lead times for import of raw materials.

The development of technical manpower will need a special attention. The plastic industry especially, the plastic conversion industry which really in small scale as well as medium scale sector is highly technical manpower oriented.

3) MACHINES

The plastics conversion capacity in the country appears adequate to meet the current needs. Since it has been keeping pace with the growth of the raw materials sector. It would need faster development efforts to later to the specific needs of consumers. Whereas the indigenous manufacturers seem to be established in the

major fields like injection moulding, extrusion, blow moulding, tubing, coating etc.the efforts will have to be directed towards more output, automation, rigid controls and quality products to match the stringent and demanding needs of consumers.

The technological development and upgradation in recycling of plastics have made tremendous progress and this has resulted in reducing or eliminating the disposal problems. It is hoped that bio-degradable plastics may come to the rescue in the immediate future.