CHAPTER-3

CHEMICAL INDUSTRIES IN VAPI: A PROFILE

3.01 Introduction

Industrial economy of our country protected by the state and external competition was prevented to grow in a world of rapid change for a long time. India made radical changes in policies to reform the economy and shift away in policies to expose the economy to free competition, open for foreign technology and capital with a view to achieve higher degree of efficiency. The question that arises is whether these policy changes have helped in achieving desired results, i.e., higher productivity, fuller capacity utilization, increased exports, employment generation, etc. This chapter is an attempt to know what changes have taken place in Vapi chemical industry during the recent times. The chapter is divided into four sections. Section I deals with profile of units surveyed in Vapi Chemical industry. Section II deals with competitiveness of Vapi chemical industry after the reforms. Section III deals with technological changes and their impact on chemical industry and section IV attempts to examine the impact of industrial growth on the environment in Vapi.

Section - I

PROFILE OF THE INDUSTRIAL UNITS

3.02 General Information

Of the 100 units surveyed, 87% were established after 1976 and very few (13%) were established before 1975 and hence majority of the units established are not new units.

The distribution of units by type of ownership reveals that majority of the industries are private limited (46%) followed by partnership (29%), sole

proprietor (15%) and public limited (10%). These chemical units are engaged in the manufacturing of various product(s). Some of the units produce finished product(s) while others produce intermediate product(s). Mostly all the industries are owned by Indians (99%) except one industry, which is in collaboration with a foreign firm.

Different firms produce various products. Hence, the requirement of raw-material also differs. Majority of the units (83%) purchase raw material from local market as the obvious reason for this being, raw-material required for the manufacturing of several products is locally easily available at a reasonable price Those industrial units, which are not able to avail raw-material locally, purchase it from the nearby industrially advanced regions or far way or other industrial centers. At times due to the non-availability of raw materials, several firms (21%) have to import the same from other countries.

3.03 Sales and Profits

There are two types of pricing determining methods adopted in Vapi chemical industry, viz., market price and contracted price. Market price is an oligopoly price. Normally it is determined by the leader firm in Vapi chemical market and at times it is determined on the basis of the negotiations among the firms producing same products.

Majority (56%) of the units sell their product(s) at contracted price, while 42% of the units sell at market price. The reason for popularity of contracted price is the nature of product(s) itself. The reason being that these units produce intermediate products, which is mainly of the nature of job work. In addition, the producers and the consumers are directly in contact with each other and hence price of the product is determined by negotiations, where price of the substitute, competitors price, demand for the final product, etc. play their role. In the survey, there were two units that

sold their product(s) at below market price. Both these units had been incurring losses and were at the verge of closure. The reasons cited for this is the lack of demand for the product and cheap availability of substitute in the market.

Table 3.01
Average gross sales

Year	Average gross sales	Compounded growth rate during		
		1990-91/ 1995-96	1995-96/ 1999-00	1990-91/ 1999-00
1990-91	11384.95			
1995-96	19199.33	11.02%	4.38%	7.65%
1999-00	23783.52			

Source: *Primary field survey data for this table and all the tables to follow.*

The table (3.1) reveals that there has been a continuous increase in the sales over the ten year period from 1990-91 to 1999-00. The average gross sales have increased from Rs. 11384.95 in 1990-91 to Rs.19199.33 in 1995-96 and further to Rs. 23783.52 in 1999-00. The sales have increased at a rate of 7.65% per annum during 1990-91 to 1999-00. But the rate of growth of sales has slowed down during 1995-96 to 1999-00 compared to 1990-91 to 1995-96. During 1990-91 to 1995-96 the gross sales increased at a rate of 11.02% per annum, which declined to 4.38% during 1995-96 to 1999-00.

Table 3.02
Average gross profit

Year	Average gross profit	Compounded growth rate during		
		1990-91/ 1995-96	1995-96/ 1999-00	1990-91/ 1999-00
1990-91	814.0355	9.45%	0.39%	4.82%
1995-96	1278.7700			
1999-00	1303.7220			
Average net profit				
1990-91	514.9665	7.36%	-0.32%	3.45%
1995-96	734.5530			
1999-00	722.9720			

Similar trend is also observed in case of gross profits. There has been continuous increase over the ten year period. The gross profit has increased at a rate of 4.82% during the 1990-91 to 1999-00. This rate of growth of gross profit was low during 1995-96 to 1999-00 compared to 1990-91 to 1995-96. During 1990-91 the rate of growth of gross profit was 9.45% and per annum, which declined to 0.39% in 1995-96 to 1999-00. In short, the sales and profits of the firms have increased during the 1990's.

Though, the net profits also show an increase, the growth rate was low compared to the gross profit. In fact, during the later half of the 1990s, the average net profits declined in absolute terms, and the rate of decline was 0.32% per annum. Some of the units have started making huge losses but are continuing with their production only with a hope of turning these losses into profits in the near future. In general, the sales and profits of the firms have increased during the 1990's.

3.04 Capacity Utilisation

An important factor that has contributed to the poor growth performance of chemical industry in Vapi is under utilisation of the capacity.

It has been established that globalisation and liberalisation would result in better capacity utilisation. There is a positive relationship between the degree of openness and capacity utilisation gain. (Mahajan, V.S., 1997).

Table 3.03

Capacity utilisation of industries

No.	Capacity utilised	%
1.	<=20	8
2.	21-40	7
3.	41-60	26
4.	61-80	20
5.	>=81	39
	Total	100

In Vapi chemical industry nearly 60% of the firms utilise 60% of their capacity while 15% of the firms utilise up to only 40% of their capacity. According to the respondents over the past few years, the capacity utilisation has decreased during the decade.

After the liberalisation many industrial units went in for excess capacity to fulfil not only the current demand but also future demand, which they had expected to increase over a period of time. Lack of demand for the products and last but not the least the slowdown in the economy aggravated the problem of excess capacity.

Thus, in order to solve the problem of excess capacity some of the

industrial units are restoring to restructuring their operations such as product diversification, cutting back on excess staff and having a lean industry, decrease in the number of shifts/ decrease in the number of person hours, selling of assets like machinery, land. For them, fuller utilisation of capacity is absolutely essential as it reduces unit costs and expands employment opportunities.

Lower capacity utilisation is a vicious circle in the entire industrial process. "If one tyre gets puncture, the whole vehicle comes to a standstill".

3.05 Export Performance of Industry

There is a need for specialisation in respect to product development, keeping in constant touch with customers and systematically using the market data to achieve deeper market penetration. These requirements lead industry to identify the areas of their strength, core competence and use their financial, manpower and industrial resources to exploit unidentified market segments. Industry ought to follow focused growth and should get out of the products that do not fall in their line of business. This approach is necessary for the maintaining of the market position of the industry. The management has to work on a long-term business strategy and handle problems that the new economic environment is causing to their unit (Dayal, Ishwar, 1998). For this, the firms explore international market for the products. The structural reforms that are aimed at globalising the economy target at rise in exports.

Exporting firms feel that promotion of export is an important priority. Export must be treated as vital activity for their industrial development since these units are operating in an environment, where there is competition wide spread.

Table 3.04
Export performance of industry

Percentage of output exported	Year			
	1990-91	1991-92	1995-96	1999-00
	%	%	%	%
Below 10	21	2	1	3
10 - 20	10	9	11	8
21 - 30	12	13	12	13
Below 30	**24**	**24**	**24**	**24**
31 - 40	8	8	6	5
41 - 50	4	5	7	7
31 - 50	12	13	13	12
Above 50	**2**	**1**	**4**	**5**
Total	**38**	**38**	**41**	**41**

However, firms still face many problems on this front. Export-orientation can by and large, act as a useful strategy for improvement of efficiency and growth prospects but the respondents fear that due to inability of the industry in exploring new markets for their products is a major set back which the MNCs are able to. They are not just capturing the domestic market but also entering into the unexplored global and domestic markets. They feel that if the chemical industry clamours for expansion in the market through penetration for the same or similar products in the limited domestic market, the domestic industry may end up competing within itself and may force some sort of fall in domestic prices, which is unhealthy for the growth of domestic industry.

Some respondents feel that poor performance of exports is mainly due to their failure to compete at the national level leave aside the

international level. This is mainly due to inward looking policies followed for the past so many decades and are now equally vulnerable to the danger of prompt liberalisation though they agree that it was essential. Empirical evidence shows that neither inward looking policies nor outward looking policies are correct all times and for all countries. Change in trading policies has little effect on the growth rates of export earnings; export grows faster only when external demand is stronger (Singer, H.W. and Gary, P., 1968). As far as Indian economy is concerned, liberalisation was initiated in order to integrate the Indian economy with global economy. But in reality, these changes have not percolated to the grass root level in the country, where the domestic firm operates. Hence, "even after a decade of policy of export promotion, India is not capable to become a competitive economy as far as exports are concerned. Liberalisation is meaningless unless and until it helps in achieving the international standards and leaves a mark on the international market", as one of the respondents remarked.

Some of the firms feel that export performance can be improved with availability of export finance at a rate compatible with interest rates at which the finance is provided in the competing countries. They feel that no amount of trade liberalisation would help in sharpening the global competitiveness of this industry until all the above-mentioned hurdles are removed.

Efforts are being made by these chemical units to improve export performance. In order to keep the volume of export expanding, the chemical units in Vapi have started undertaking changes in quality improvement and product diversification and also the direction of export i.e., emphasis is given on broadening and deepening their production base. This calls for, according to them, technological changes in production and new marketing strategies. Efforts are made, under new policy, to create a culture of quality concern to improve external trade and make India a top exporting countries. This they feel is entirely a realistic and achievable goal, given our long

history in trade, our vast production base and our rich endowment of natural and human resources. The main objectives of the new policies are to unshackle the exporters to put up the best performance that they are capable of.

SECTION-II
INDUSTRY AND COMPETITION

3.06 Competition

Every industry has to have a vision for its future growth. It must develop a mission to achieve specific goals. In other words, the industry must know where it is and where it wants to go (Ajit, D. 1992). In the environment created by the new policy adopted by the government in 1991 competition has become very keen. The old complacency must be given up if we have to develop an edge for industry to survive and grow.

All the industrial units under survey irrespective of size feel that during the last 10 years competition in business has increased. As many respondents point out, "with the liberalisation of our economy, our chemical industry is facing an environment to which it was not exposed earlier i.e., they enjoyed a secured and protected market in which quality, cost and techniques of production did not play a crucial role. Suddenly, they are finding themselves handling the issues of crucial importance from the survival point of view". Prior to this, chemical industry has survived under much favoured protection. Industrial units have started making all round changes because now they feel that only those industrial units, which are able to produce and deliver goods and service of high quality at low cost through continuous technological up-gradation will be able to survive. Whereas others will be completely wiped out of the market. The economy, according to them. has been opened to such an extent that these industries for the first time have come to realise not only how vulnerable and weak

they really are but also that they are facing tough competition both from the domestic and international market. As a matter of fact, Indian industries did not find it necessary to develop the art of facing competition at the national level; the position of the industries in the face of international competition is worse. The products produced by our industries have little acceptance in the international market (Rao, K.V. 1995). Some of the respondents were of the view that it was necessary to have our own economy restructured before implementing the policy of open economy so as to prepare each and every sector for intense competition. Liberalisation should have preceded globalisation. Had it been so then the policies adopted would have been a success.

Some of the respondents attribute the deteriorating standards in Indian Industry, largely to the unhealthy protectionism and isolation of Indian industry from the global scenario for a long time when the Indian industry did not bother much for the quality improvement.

Table 3.05
Competition in business

No	Competitors	Local		Within the state		Within the country			
						Domestic		Multinationals	
		Number of units	%	Number of units	%	Number of units	%	Number of units	%
1	Large scale producer	10	15.6	16	25.0	26	40.6	12	18.8
2	Small scale producer	15	45.5	9	27.3	9	27 3	-	-
3	Importers	-	-	-	-	2	66.7	1	33.3

Almost all the respondents were of the view that before chemical

industry could not learn to compete in itself it is made to compete with multinational companies. So now they are facing competition not only from the domestic industry but also from multinationals.64 industrial units are facing competition from large-scale producers i.e., from local (15.6%), within the state (25.0%), domestic (within the country 40.6%), multinationals (18.8%). 33 industrial units are facing competition from small-scale producers i.e., from local (45.5%), within the state (27.3%) and domestic (within the country 27.3%). The liberal import of the products too has affected the domestic products in the market as they are forced to reduce their prices. They believe that the basic objective of multinational companies is to ensure fuller utilisation of their very high installed capacities and also to earn quick profits at the same time. Not only this, these multinational companies are expanding market for their products by capturing our markets through cutthroat competition and also moving to unexplored domestic markets. They are manufacturing those products that have easy market availability and low investment rather then those having long-gestation period and those that need huge investment. All of them agreed that, the multinational companies are following expansionist policy, which is adversely affecting the local and domestic chemical industry.

According to Rao, Subha, A. (1994), changes in our industry are rapid and multidimensional. The industry has to bring about changes faster and more frequently than ever before.

Further, all the respondents feel that the present free market oriented economic policy has brought in more competition and the burden has fallen on the industry to see how it can utilise its resources and compete with multinational companies that have a strong hold over the strategy for improving technology, reducing production costs and at the same time believe in the philosophy of consumer sovereignty so as to cope with ever changing market environment.

Increased competition not only from the domestic industries but also the multinational companies has an increasing pressure on the chemical industry for bringing about improvement in quality, cost reduction, up-gradation of technology, labour efficiency, etc. Almost all of the respondents agreed that it is essential. Many respondents are of the view that the competition in many cases is unequal and though this will lead to efficiency, it will result into non-survival of the inefficient units and especially small industries. Of the 100 respondents, 17% of the respondents feel that their competitor's product is superior. They apprehend that the chemical industry, however efficient, will have to face the giant large-scale companies (domestic) and multinational companies with their command over resources, their vast R&D establishments and their tremendous strength and global reach.

Table 3.06
Reasons for competitor's product (s) being superior

No.	Reasons for competitor's product(s) being superior.	Number of units	%
1.	Better quality of products	3	17.6
2.	More advanced machinery	1	5.9
3.	Labour efficiency	1	5.9
4.	Selling and marketing organization	13	76.5
5.	Cheap banking and credit facilities	1	5.9
	Total	17	17

Of those that feel that they are facing competition, 17.6% of the respondents feel that it is the better quality of the product, which makes their competitor superior as their competitor is in a position to up-date technology. 5.9% of the respondents feel that it is the advanced machinery,

which makes their competitor superior. Multinational companies are considered to be the master of new technologies. Almost all respondents said that whenever international flow of technology has expanded, the pace of development has been rapid but this is not the case as far as our economy is concerned.

5.9% of the respondents were of the view that their labour efficiency is much lower. The reason for lower productivity of the workers according to them is the apathetic attitude of the employer towards the improvement of environment at the workplace, which is cost-ineffective in the long run. Moreover, the workers are not treated as long-term assets. Poor working conditions, exploiting the workers by paying them low wages, etc. have further affected the productivity of the workers in the industry. 76.5% of the respondents feel that it is the selling and marketing strategy that makes their competitor superior. According to them, large scale (domestic) and multinational companies can penetrate and also capture market as they enjoy sound marketing network. These companies through their better access to advanced information systems and due to their market reputation can successfully capture the consumer markets in the country, which the local chemical industry is unable to do. This according to them is the major reason for failure of the chemical industry.

5.9% of the respondents feel that their competitor is superior as far as cheap banking and credit facility is concerned. Their competitors not only have huge financial base but they can also get loans from international financial institutions more easily than do the indigenous firms.

By acquiring earth-spanning technologies, by developing products that can be produced anywhere and sold everywhere, by spreading credit around the world, these multinational companies we normally think of, as economic rather then political, private rather than public; are becoming the world empires of the 21st century (Kumar, Nagesh, 1994).

SECTION-III
TECHNOLOGICAL CHANGES AND INDUSTRY

3.07 Technological Changes and Industry

Industrial change is a dynamic process and resistance to it is a natural reaction. Industrial (external and internal) environment is changing so fast that failure to change at any moment is a step towards obsolescence. The answer to managing the galloping obsolescence lies in change (Sharma, N.K. 1999). It is felt that change will upset the existing system. The policy makers in India had also not anticipated a pain free transition to an open competitive economy. Today it is very much essential to match talent and capabilities with changing needs and requirements. Surplus manpower, technological changes, huge inventories, losing customers and closer of industrial units are the different faces through which these industries are going through today.

The pace of industrial change becomes galloping when the rate of technological change is extraordinarily high. Under such circumstances success of an industry depends upon how efficiently the system adapts to changing environment. The process of change has been going on for some time; only the speed of change has gained new heights in recent years (Sharma, N.K. 1999).

Chemical industry in Vapi is also not free from this. 86% of the chemical units have adapted to technological change during the last few years. The question that arises is why do industries adopt change in technology? The important motives, which lead industrial units to give priority to technological changes are, the search for new markets and business opportunities, development of in-house technological capability, enhancement of quality for products and services, modernisation of production system and enhancement of technical and managerial skill. The

basic reasons underlying these motives are that sales will increase along with market share. They feel that if the chemical industry is to survive, grow and remain prosperous, it must adapt to the demands of the changing industrial environment. Since these demands are constantly changing industry also has to respond accordingly.

3.08 Type of Machinery Installed and Amount Invested

The rate of adoption or diffusion of technology will depend upon the motivation and willingness to adapt to new ideas.

Table 3.07
The type of machinery installed and amount invested

No.	Type of Machinery.	Amount Investment (in Rs)			Total
		<=10	11-20	21+	
1.	Automatic.	3	24	26	53
2.	Semi-automatic.	2	2	31	35
3.	Non-automatic.	7	7	2	16
	Total.	12	33	59	86

Table 3.07, shows that 53 industries have switched over to automatic machinery, 35 have installed semi-automatics while, and 16 have installed non-automatic machinery recently. The respondents were of the view that industrial scenario is changing rapidly and will continue to change further. They have accepted the fact that change is inevitable and must be managed; the industry has to be flexible enough to accommodate change and changing condition. They feel that in this changed environment in the Indian industry sector, producers are turning towards teams building, shared vision between the employer and employees, customer driven production, continuous improvement in cost reduction, quality improvement, delivery on time,

improved marketing strategy and on time response to customers. In the speedily changing environment, both change and management of technology are equally important.

3.09 Difficulties in Introducing New Techniques of Production

Regarding difficulties faced by the industry in adopting new technology 59% of the respondents were able to update technology while 41% were not.

Table 3.08
Difficulties in introducing new techniques of production

No.	Difficulty in introducing new techniques.	Number of units	%
1.	Lack of finance	7	17.1
2.	Lack of skilled workers	1	2.4
3.	Non availability of equipment	3	7.3
4.	Lack of demand for the product	33	80.5
	Total	41	100.0

Of those who found it difficult to introduce latest techniques of production; they have introduced a new technique but are not able to update it, 17.1% feel that it is due to the lack of finance. For 2.4% of the respondents, it is non-availability of skilled workers, 7.3% feel that it is non-availability of equipment and for majority (81%) it is the lack of demand for the product. Hence. mainly due to the lack of demand for the product, the technology is not updated.

3.10 Reasons for Making Change in Technology

After 1991. the scenario has changed completely. Though the

industry has made super normal profit in the past; with change in policies after 1991, it is finding it difficult to face the growing competition. Small scale units have apprehension about their very existence in the long run. This apprehension is leading to down sizing, no further investment in improving production, reducing the number of person hours, mergers, working shifts, etc. However, all of them agreed that in order to remain productive and profitable, industrial units have no choice but to remain competitive at all time, in terms of quality, cost, labour, supervision, material, *et. al.*

Increased competition has forced these chemical industries to adopt changes in technology in order to reduce the cost of production. This has affected employment in industry and has led to investment in human resource development.

Table 3.09

Reasons for change in technology

No.	Reasons for change in technology.	Rank
1.	Increase in productivity	3
2.	Reduction in material/energy costs	2
3.	Reduced need of labour	5
4.	Reduction in wage costs	6
5.	Reduction in supervision costs	4
6.	Improvement in quality of product	1

Table no. 3.09 shows the reasons for change in technology. The most important reason is improving the quality of their product. Other reasons in that order are to reduce material/energy cost, increase capital productivity, reduce supervision costs, reduce labour and last but not the least to reduce wage costs, in short, improved productivity and reduce cost effectiveness.

Industry, which is ready to accept new products and adopt new technology, is likely to achieve a higher rate of growth. The name of the

game now is not investment so much as efficiency or higher productivity and the chief instrument for this is a continuous upgradation of technology. It is necessary to occupy these new commanding heights, if not then the industry cannot move ahead (Patel, I. G., 1990).

3.11 Effects of Technological Change

All the respondents were of the view that technology affects practically every aspect of industry. Among employees it is rapidly updating knowledge, changing human behaviour, attitudes, socio-economic conditions, job description, etc. At the same time there is an environment of harmonious industrial relations, new values, multi-skilling, competition among jobs, increased mobility. For industry, technological change has led to increased competition, faster development, newer pattern of work, inter nationalisation, high competition, obsolescence of products, etc. There are many benefits and also undesirable effects of technology. It helps in contributing to increasing production, reduction in labour stress and high standard of living. Its undesirable effects include unemployment and unsatisfying jobs.

Table 3.10

Effects of technological change

No	Effect of change in technology on-	Increased	Decreased	Remained Same	Total
		%	%	%	%
1.	Quality of products	86	-	-	-
2.	Cost of production	-	62	24	86
3.	Overall employment	9	63	14	86
4.	Skilled labour	78	3	5	86
5.	Unskilled labour	1	70	15	86
6.	Sales	42	23	21	86

All the 86 industrial units that have undergone change in technology feel that quality of the product has improved. They were of the view that maintaining product quality is an important aspect of this challenge for the chemical industry.

62% of respondents were of the view that change in technology has led to reduction in cost of production while, 24% feel that it has remained the same. The ever-rising unemployment is not only due to technological change but also due to industrial restructuring as the industry is passing through a transitory period. At the individual firm level, direct and indirect consequences of the introduction of new technology and industrial restructuring were being realised. Impact of introduction of new technology on the overall employment of industry shows that, in 63% of the industrial units overall employment has decreased, in 14% it has remained the same, while only in 9% it has increased.

Of the 86 units that have adopted technological change, in case of 78% of the units, proportion of skilled labour has increased. All the large-scale and some small-scale units that have adopted technological change have an option of either retraining or reskilling of the existing workforce or directly displacing or substituting unskilled workers by skilled workers. In 5% of the units skilled labour has remained the same while in 3% of the units skilled labour has decreased.

In 70% of the units unskilled labour has decreased, and only few, i.e. in 15% it has remained the same.

Though the quality of the product has improved and the cost of production has decreased then why is there no significant improvement in profit? The important reason for this is the decrease in price of the product. It is also due to the lack of demand for the product, stagnant market and overall recession in the economy.

Respondents were of the view that the new industrial policy has a chain effect. On the one hand it has led to competition in the product market, change in the production process and new forms of industrial organisation and reorganisation of the production system itself; on the other hand, it calls for change in the skill composition of the workforce. Just as some portion of the labour force may become surplus/ redundant in the industry, the industrial units if did not prepare themselves for the competition, may themselves become redundant/non-competitive and therefore face closure.

Many of the respondents were of the view that managing technological change is a major responsibility of HRD departments in the industry. For initiating change, the HRD practitioner in industry should change and adapt to new situations. HRD manager should oneself not be a mere specialized manager but professional with multi-skills. They feel that the need of the hour is to transform employees through HRD activities to

become competitive for the survival of the employees and the industry. In the changed environment HRD personnel's are going to play an important role.

3.12 Reaction of the Workers Towards Technological Change

The initial employee attitude towards new technology is of suspicion regarding the objective of introducing new technology and apprehension about difficulty in retraining and future careers (Strauss, G. and Sayles, L.R. 1975). The attitude of trade unions towards technology can be classified into four categories. Namely, prevent change, slow down change, cooperate with management in change, expedite change (Sharma, A.M. 1996).

Union does not always oppose change. If the change brings benefits, for example, higher productivity accompanied by higher pay union helps in promoting the change. However, if the new technologies are applied in ways that lead to reduce employment, then resistance is obvious (Sharma, A.M. 1996). The implementation process of change in an industry requires industrial and human resource understanding (Charles, K. 1991).

Table 3.11
Attitude of the workers towards technological change

No.	Attitude of the workers.	%
1.	Favourable	35
2.	Indifferent	39
3.	Hostile	12
4.	Not applicable	14
	Total	100

As is shown in the table 39% of industries did not face problems in

adopting new technology, as the workers were indifferent. In 35% of the industrial units workers behaved favourably towards technological changes. Before the new technology was introduced in these units meetings were held between the union, workers and management and they were informed about these changes and assurance was given to workers that there would be no retrenchment, instead they would be provided with the training facilities. Not only this, these units made their workers understand how the improved technology would benefit their company and in turn how they could be benefited from this. Workers, management and union were involved from the initial stage till the implementation of new technology. According to them, union also realised the need of new technology in order to face the competition and also for the growth of the industry. Keefe, J.H. (1991) found that the most common response of unions to technology has been "willing acceptance which tacitly recognise management's right to implement new technology".

In 12% of the units workers were hostile when the new technology was introduced. They feared that changes, if implemented, would directly affect them in several ways. Modernisation of plant and machinery will involve major technological change accompanied by retrenchment, deployment, training, etc. They feared that management would attempt to introduce technological change by using their prerogative to hire and fire workers. Regarding the effect of technology on jobs, the respondents were of the view that with technology moving as fast as it is, only certain occupations will exist. Technology does not always destroy jobs, but it creates different jobs for which more professional and trained employees would be required, instead of unskilled workers.

Hence, the success and speed of labour adjustment and therefore, to a certain extent, of industrial restructuring, would depend upon the labour. A faster growth of employment opportunities would reduce the resistance to

labour adjustment and make restructuring easier. On the other hand, slow growth of employment leading to accentuation of employment situation, would render labour adjustment difficult.

3.13 Policy Adopted by the Management to Help the Affected Workers

Globalisation of business is inevitable. The trend is irreversible. For their own survival, industries will have to shift from inward looking stance and bureaucratic practices to those that encourage innovation and market responses. The question of considerable significance is how this transition is best achieved. The strategies and changes have to be planned carefully. The planners have to anticipate human problems involved in the transition and evolve appropriate measures to deal with it (Hammer, M. and Champy, J., 1993).

It is believed that in this ever-changing industrial environment, many workers are likely to be displaced. 63% of the respondents feel that labour force is not affected by new industrial environment, they can be trained, retrained to adapt to new changes.

Table 3.12
Policy adopted by the management to help the affected workers

No.	Policy adopted to help the affected workers.	Number of units	%
1.	Retraining and transfer to other sister concern	12	34.4
2.	Retrenchment	25	76.6
3.	V.R.S scheme	7	18.9
4.	Starting the unit in the other area and transferring workers to the units.	2	5.4
	Total	37	100

Retrenchment is being adopted by a large number of industrial units. They responded that they have opted retrenchment because of the failure of new technology to create and sustain productive employment capabilities as

a part of the overall growth strategy and moreover some of their units became unproductive and started making looses. As they were not able to survive the competition they were forced to retrench the workers. Retraining and transfer to other sister units is another measure for absorption of labour. They feel that rapid technological changes are placing greater requirement for retraining and continuing improvement of skill of those already in workforce at any point of time. The initial pre-employment training would not mean much in the absence of such follow-up measures. This is because the obsolescence of skill would force out those already employed for those with training. So they all agreed that, those employed, with whatever level of training, a wide variety of courses of retraining for continuous skill improvement would have to be designed and innovatively carried out.

Some of the respondents were of the view that VRS is being opted as compared to other options to avoid the conflict which might be caused by redundancy and resultant employees' action. Others have opted for VRS because they feel that retrenchment can adversely harm the image of their industry and adversely affect its product reputation in the market.

Section-IV

INDUSTRY AND ENVIRONMENTAL DEGRADATION

The aim of industrial development is to provide comforts to the human race and make human life happier. Environment plays a protective and promotional role in the survival of humanity. Environment alone cannot make human life liveable, nor industrial development can provide solution to all over economic ills. There is a close relationship between industrial development and environment. Both are absolutely vital for humanity. (Vikunthe, L.D., 1998). Though industrialisation has many benefits and brings prosperity for humanity, it also gives rise to a number of problems and side effects (Murthy, S. 1998). Rapid industrialisation is resulting in irreparable contamination of surface, groundwater, air and soil, The industry

is also discharging contaminated solid waste and hazardous effluents Diseases unknown to the human kind for long time are causing threat to the existence of the living organism. Interest in environmental concerns has become intense in recent years, with much pressure being placed on altering policies which in the past have resulted in degradation of environment, court actions and legislations have required industrial concerns to be more careful about pollution. (Nagraj, R. and Nagraj, S. 1998).

Humankind has known three revolutions, namely, agriculture, industrial and informatics. The world is now on the threshold of a fourth revolution, which will make environmental performance and sustainability the basic pre-requisite for economic growth and competitiveness. The world will have to march ahead for keywords, "conserve, reduce and recycle". The only way out is to have technological progress, which will lower pollution-intensity. The role of technology in economic and social advancement is not a new phenomenon. In future, technology must ensure an ecological integrity of the country along with growth (Murty, S., 1998).

3.14 Reasons for Treatment of Chemical Effluents

Environmental degradation is not a new problem as far as Vapi is concerned. Increased economic activities in this region associated with development are leading to environmental degradation. Which, in turn is giving rise to infinite number of problems. All the industrial units believed that treatment of effluents is necessary.

Table 3.13
Reasons for why the treatment of chemical is necessary

No.	Reasons for why the treatment of chemical is necessary?	%
1.	Mankind	9
2.	Environment	78
3.	To keep the workplace, surrounding and society clean	9
4.	Health, hygiene and safety	9
5.	To prevent cropping up of new diseases	2
6.	To prevent this planet and all kinds of life on this planet	10
7.	To make this world a safe place not only for our present but also for our future generation.	7
	Total	100

Majority were of the view that increased economic activities in this region are resulting in the ecological degradation in the form of poisoning of rivers, sea and underground water resources, soil erosion, air and land pollution. Much of the damage is irreparable and restoration is also expensive. Increasing pollution has led to warming up, rise in temperature, climatic changes. The increase in environmental pollution is hazardous for the people of the town.

It is mandatory for all the industries to have their own effluent treatment plant to give primary treatment to water effluent at the unit itself and then through the pipe lines it is supposed to be discharged to the common effluent treatment plant for further treatment before it is pollution free.

3.15 Types of Effluents

Mainly three types of wastes/effluents are produced by chemical industry in Vapi, namely, air, water and solid. Although industries under survey were of the view that wastes /effluents produced by their unit are within the prescribed limit.

Table 3.14
Total cost of treatment of effluent/ waste

No.	Treatment through OETP	Years.							
		1990-91		1991-92		1995-96		1999-00	
		No.	(%)	No.	(%)	No.	(%)	No.	(%)
1.	11-20	1	1.6	1	1.6	1	1.0	2	2.0
2.	>=41	60	98.4	60	98.4	99	99.0	98	98.0
	Total	61	100.0	61	100.0	100	100.0	100	100.0
	CEPT								
1.	< = 10	1	100.0	1	100.0	1	1.0	1	1.0
2.	> = 41					98	99.0	98	98.0
	Total	1	100.0	1	100.0	99	100.0	99	100.0

All industrial units have their own effluent treatment plant and majority of the industrial units also make use of common effluent treatment plant. In Vapi, water pollution control and waste treatment work has been neglected to a great extent. Many of the small scale and some of the medium scale industries do not make use of their own effluent treatment plant and many of the industries which have installed it under the pressure from the Pollution Control Board of Vapi are not interested in using it as it cuts down profit as the large firms say. Over a period of the time the sources of water pollution have multiplied due to increasing volume of effluents from

industries and municipal sewers. The all-seasonal *nallahs* have been converted into perennial drains. Arrangement for treatment of sewage and effluents has failed to keep pace with sharp increase in the discharge of pollutants into the river. For these firms, the most economical means of disposing the liquid industrial wastes is to discharge them into a municipal sewage. This discharge of untreated sewage enters into water bodies. Even while moving through the main road one can see colourful water running into open sewage since the sewage system in Vapi is not underground. During the monsoon problem is all the more acute when this chemical water starts overflowing on the road and there is no other way out but to walk through it. This is also a cause of many other diseases.

As far as solid waster are concerned VIA (Vapi Industrial Association) has provided its members with common waste disposal area where the entire solid waste is collected. 19 industrial units were of the view that waste could be recycled and only 4 units recycle it on their own while other 15 units sell it for recycling. 18 respondents were of the view that R & D programmes are being carried out to make use of the solid waste, which at present is being disposed off at common waste storage area. They were of the view that attitude of the units towards solid wastes is changing. It is no longer being looked at as unutilised or misused resource. Some of the industries producing very small amount of the waste collect solid waste in drums. After 6 months or a year they take it to the dump yard. This is done in order to avoid bearing the transportation cost every month for a small amount of effluent. But the fact revealed a different story, solid waste(s) was just lying outside the backyard of the industries emitting dirty odour and workers were found to be working in such an unhealthy environment.

If this is the state, who is responsible for the ever-increasing pollution? Almost all the firms ended blaming each other i.e., large-scale firms blamed the small-scale firms; small-scale firms blamed large-scale

firms and medium scale firms and so on.

The large-scale units feel that initially they were the targets but now with increasing awareness during the 1990's the large firms are switching over to environment-friendly technologies. While, the small-scale polluting industries which are major emitters of pollutants are causing greater threat.

Many respondents feel that deteriorating environmental quality in Vapi despite the existence of regulations clearly indicates that regulations by themselves would not protect the environment. The failure of the regulatory system is mainly due to inefficient and corrupt practice and poor monitoring and weak enforcement.

In this regard, informal talks were held with many residents of Vapi and virtually every one was of the opinion that sometime many of the gases are released at night and in the morning it gives the illusion of smog. This generally happens when extremely large amount of pollutants enter the air, or when the air volume is stagnant. Many of the gases of various colours and composition emitted by industrial units have odour which itself is a cause of concern. Information received from the ESI doctor also reveals that diseases caused due to air pollution is on the rise in the recent times. There is an increase in the number of incidents of diseases such as lung infection, stomach cancer, vesicular lesions of the nervous system etc. During informal discussion at Pollution Control Board, Vapi it was known that problem has become serious since large number of small and medium scale industries do not follow rules as per the fixed standard with respect to height of the chimney for discharge of smoke. This pollution is adversely affecting health of the people in Vapi.

The challenge before Vapi chemical industry is to ensure quality of life and if possible, enhance it without weakening the pace of industrialisation, whether it be in the large medium or small sector. A

solution needs to be sought in the direction of a better and clear environment by reducing pollution to a minimum level.

The respondents were of the view that efforts should be made for not just the abatement of pollution but by developing a policy of environment protection in this region. This however requires advance planning for all the industries in this area. There is an urgent need for the introduction of new process and of co-ordination activities in such a way so that the wastes and effluents become usable resource rather then a problem not only for the people residing in these areas but also for the community as a whole at large.

Some of the respondents were of the view that the main reasons for environment deterioration in Vapi is identified as lack of proper monitoring and enforcement of existing environmental protection laws and regulations, inadequacies in environmental date including difficulties in data collection and processing and lack of knowledge of past trends which becomes a major limitation for the planning, preparing and implementing, environmental management programs. So what is being done is industrial units prepare detailed environmental audit report. Critical location efforts are also made to ensure that new units reduce emission at source by making use of environmental management plans at the firm level, prior to setting up new units. There has to be a continuous R&D program for the development of technologies for maximising the output while minimising the pollutants/ wastes.

Industrial belt from Vapi to Mehsana has a high number of chemical industries. It is the "Golden Corridor of Gujarat". Vapi one end of this "Golden Corridor" is facing environmental problem. Efforts made by few units would not solve the problem. All the industries as well as the society have to come forward to tackle these problems.

3.16 Conclusions

Increased competition not only nationally but also internationally is increasing pressure on chemical industry for bringing an improvement in quality and cost reduction. For this industrial units have adopted and upgraded technology. This has affected employment and has led to investment in human resource development. Now in Vapi chemical industry quality, cost and technology are playing crucial role. There are many problems, which have to be solved, many investigations that have to be carried out in order to solve problems that new technology, new products and the new industries will create, not to forget the existing unsolved one. Environment protection should be a part of industrial policy so that right from the beginning an environmental assessment of the process takes place.

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