CHAPTER VII.

DEVELOPING APPROPRIATE TECHNOLOGY AND PRODUCTION PROCESS.

1. Introduction, Handmade Products. Products involving simple assembly and finish. Products where consumer tastes are found important. Products with Low Demand and Service Industries.

2. Small Scale Industries and Capital Saving.

3. Differences in Technique of Production.

4. Employment Position in Iran.

5. Use of Labour to Save Capital.

6. Developing Appropriate Technology.

7. Technology in Iran.
It is absolutely prohibited for the Government to grant concessions to foreigners for the establishment of public companies and organizations or enterprises in the commercial, agricultural, industrial and mining and service sectors.

Article 82:

The employment of foreign experts by the Government is forbidden unless their services are highly essential. Their employment must be with the approval of the Islamic Assembly.
DEVELOPING APPROPRIATE TECHNOLOGY AND PRODUCTION PROCESS

7.1 Obviously the choice of product and production process are very important in the problem of encouraging small scale industries. If a relatively large sample could be taken and relatively accurate data regarding capital employment and output are collected over a number of years, the analysis of the data would positively indicate the product, the manufacture of which would be more advantageous in the small scale sector. We worked out the output capital ratios regarding this in some of the industries contacted by us, and realized there are certain products the manufacture of which is beneficial in the small scale sector. The products are:

1 - Simple metal products: One industrialist informed us that metal products which are simple in nature and required moderate precision could be manufactured more economically by small scale industries. Since such products are capable of being produced in a short series of operations. These products are balls, pistons, bushings, metal hoses, system rings, melting and refining non-ferrous metals, bolts, dies, special gauges, brass and copper castings, moulds etc.

According to the discussion with industrialists producing these items, it was revealed that large factories would not be in a position to manufacture these items with the same advantages as their main items. Output as per unit of fixed assets was stated to be generally higher in such
There is great scope for the manufacture of simple method products in small scale industries. Many consumer items such as, buckets, plates, cotton, kitchen equipment and copper utensils can be conveniently produced by the small scale industries.

The small scale, medium scale and large scale industries should work in harmony with each other in the making of various products for example, the small scale sector can produce simple metal products needed by the different large scale and medium scale industries situated in Yazd, Tehran, Tabriz and Isfahan. Surveys should be carried out concerning these requirements and the research obtained should be published so that there is a greater awareness of the necessity of small scale industries and more and more such industries can be established. Unfortunately, most of these items were imported and hence, with the present lack of imports they are in extreme shortage at the moment. Thus, it is in the interest of Iranian Nation to encourage small scale industries to start manufacturing their own products. In this way Iran will gradually be free of the need to import and it will become self reliant in the production of these items which are simple in nature and require moderate precision. The small scale Industrial Organisation should pay immediate attention to developing and promoting this matter as it will
reap large benefits for the nation in a very short time.

2) **Handmade products**: Generally, it was found that hand work involving artistic and precision work could be done advantageously in small scale sector. The output per unit of fixed assets was higher in respect of handmade products. The fixed assets were in each case lower for example, Handloom, wooden furniture, fabrication work etc.

Artisans producing the various types of handicrafts possess great talent in Iran. Their skills are handed down from generation to generation. Traditionally, the art passes from father to son and so on. There is no lack of art in Iran. But, it is a pity that these artisans are not properly organised. Their commercial strategies are weak. It is about time to take them in hand and teach them to develop their small units on modern and scientific lines. In other words, their artistic skills must be supplemented by marketing ability. The government should start short and long term courses and teach these artisans the principles of organisation in order to increase their commercial dexterity. They should also be introduced to the advantages of systematic accounting and record keeping. In this manner, these small units could be strengthened all over the country (for more detailed information regarding this matter, please refer to chapter 4 dealing with handicrafts).
3 - Products involving simple assembly and finish

It was seen that products which involved simple assembly, mixing and finishing operations could be manufactured in the small scale industrial sector more conveniently. In such units, it was noticed, that fixed assets per employee were generally lower and output per unit of fixed assets were generally higher. Products like confectionary, bakery products, insecticides, mosaic tiles, cement tiles etc. are some of the products involving simple assembly and finishing and which can be grouped in this category.

There is much opportunity for the development of products used in agriculture and based on simple assembly. Even in the field of Agriculture, there must be advancement and there is a need of modern tools in order to improve production, for example, the simple metal plow, weed removing and crop cutting equipment. There is also need for insecticides. All these items were being imported in the past, but now the small scale industries should begin their manufacture. Agriculturists should be educated in the use of better equipment and insecticides, so that the quality of crops is improved. Small scale industries can thus be supplementary to the development of agriculture.

During our survey we learnt that there are a sufficient no. of industries manufacturing cement tiles and mosaic tiles. Industries making confectionary and bakery
items are in adequate number, too. Most of these industries are in the small scale sector.

4 - **Products where consumer tastes are found**

*Important*: There are some products where output per unit of fixed assets are generally lower and fixed assets per employee are correspondingly much lower, for example, readymade garments. The small scale industrialist informed us that readymade garments are products which have many variations in size, shape, quality, design, fashion, style, colour etc. The consumers have tastes and likings which are crucial in the case of such products. So readymade garments could be produced conveniently in the small scale sector.

Readymade garments, knitwear and textile exported in 1974 and 1975 were 44.2 and 28.7 million dollars respectively.

5 - **Products with Low Demand**: There are some products which cannot be economically manufactured on a large scale. The output per unit of fixed assets was higher in the case of these products. The industrialist stated that if demand increased there was scope to use modern equipment which would increase fixed assets per employee.

Prior to the revolution, Iran imported readymade garments. However, since then, a number of small scale units are making readymade garments such as shirts, coats, pants, socks, caps etc. We believe more such small scale industries should come into existence and there is also a possibility of exporting these items to Middle East countries. As compared to more advanced countries, labour is cheap in Iran and hence it can meet the competition put up by other countries like the U.S.A., Korea, U.K., etc. During the time of the late Shah, various articles of the military uniforms were imported from the U.S.A., for example the overcoat, socks, shoes, even underwear etc. But, now some small scale industries have been opened for the production of these items. On account of the shortage of raw materials, spare parts and adequate management, production at the moment is limited and in some cases, even at standstill. Hence, the government should pay immediate attention to these matters.

Tricycles, wooden toys, metal articles, certificates required by schools, simple surgical equipment for hospitals, wooden furniture, television sets, stereo equipment, radios etc, are among the number of items listed as having low demand. These articles are more suited for production in small scale industries.

6 - Service Industries: Service Industries also are industries which can conveniently be conducted in the
small scale industrial sector e.g. Printing Presses, Book Binding etc. One press owner informed us that commercial printing on job basis and book binding, are generally more economical on a small scale. They offer higher output per unit of fixed asset. But according to him, there was scope to use modern machinery and equipment which increases the value of fixed asset per employee. In the case of some products like cookers, domestic utensils, gauges, exercise books etc., output per unit of fixed assets was higher and fixed assets per employee were lower.

Regarding products like ferrous and non-ferrous castings, trailers, brick making and wooden toys, output per unit of fixed assets were higher and fixed assets per employee were lower. So, these products also could be manufactured in the small scale sector much more conveniently.

In the case of products like agricultural implements, electronic instruments, automobile crank shafts, lubricating oil, pumps, hardware etc, the output per unit of fixed assets was much lower and fixed assets per employee were very high. So, these products should be manufactured in the large scale sector. These products require a broad and capital intensive base, hence, they are suitable for manufacture on a large scale.
With the increase in literacy, the demand for books is on the increase. Quite a few printing presses and book binding shops have been opened. Inspite of this, there is still scope for the creation of more printing press industries.

A large number of domestic utensils, cookers, gauges etc. were import items. We hope, the government will avoid the import of domestic articles. Producers in Iran should be encouraged to manufacture these items and circulate them, both, within the country and also in the nearby markets of middle east countries. In this manner, the nation will be able to save on foreign exchange.

Moulds are being produced in Iran for the making of bricks and for ferrous and non-ferrous castings. Industries manufacturing these items should be encouraged. The Islamic government of Iran is also giving full support to industries producing cycle and automobile spare parts, trailers etc.

<table>
<thead>
<tr>
<th>Items suitable for production in the small scale sector and the main reasons for their selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simple metal products</td>
</tr>
<tr>
<td>products depending on consumer tastes</td>
</tr>
<tr>
<td>Handmade articles</td>
</tr>
<tr>
<td>Products with low demand</td>
</tr>
<tr>
<td>simple assembly &amp; finishing products</td>
</tr>
<tr>
<td>Service Industries</td>
</tr>
</tbody>
</table>

Lower fixed assets per employee & higher output per unit of fixed assets
7.2 Small Scale Industries and Capital Saving

There was a marked tendency for units of small size to be associated with capital saving and there was some truth in the belief that small scale industries offered opportunities for capital saving, which are absent in larger industries. If capital intensity in small, medium and large scale industries were compared and data was collected from different centres of production, it is difficult to say whether this supposition would hold true. Our discussion with the small scale industrialists, however, showed that differences in the degree of capital intensity in different industries differed according to the nature of the industries. While analysing the use of capital investment, it was discovered that a choice of product and choice of technique was more important than the scale of operation or the size of the enterprise. Obviously, these factors are related to each other. It was believed that opportunities to save capital could be made if products were properly selected and if techniques of production were appropriately adopted. With regard to this it has to be observed that the capital saving would be dependant on the efficiency in operation of small scale industrial units. However, even if products are carefully chosen and techniques of production are properly selected, capital saving would come true only if the small scale industrial units were efficiently operated. The management of the small scale industrial units should
be efficient otherwise the unit will be unable to save capital. The small scale industrial unit must have raw materials regularly and in adequate quantity. The workers will have to play an important role in maintaining the efficiency of the small scale industrial unit. Continuous electricity and water supply is also necessary. Spares and components must be made available to the small scale industrialists when needed. If the above factors are adverse, then the capital saving would not be present in the small scale industrial units. Only when all these factors are in harmony with each other, can capital saving be a reality.

It was noticed that small scale enterprises showed comparatively shorter gestation periods, so capital could be saved by going into production during the initial stages themselves. Small scale industrialist could also make use of outmoded machinery, equipment and materials more easily. These are some of the points which are in favour of small scale industries as far as capital saving is concerned.

A small scale industrialist told us that his estimate of investment and calculation of anticipated future demand was incorrect or if his judgement of cost proved to be wrong, or even if the supply of raw materials turned out to be irregular, then small scale units would have more capacity to change their line, and minimise losses in terms of money and plant and machinery also.
All these factors in favour of capital saving are more possible in the small scale sector. It is easier for small scale industries to recover from incorrect judgements of future demands and to minimise monetary losses and changing their lines of production.
But large scale industries cannot afford such mistakes and inaccurate judgements as they would result in relatively greater monetary losses and wastage of resources. Thus, we see the advantages for capital saving offered by small scale industries.

7.3 Differences in Technique of Production

Discussions with small scale industrialists revealed that there were great differences between capital labour ratios calculated in respect of different small scale industrial units and between different industries. These dissimilarities in capital labour ratios were mainly due to varying techniques of production used in different units of the same industries and in different industries for example, it was seen that some printing presses used mechanical methods of type setting, they used lino machines or mono machines whereas there were many printing presses which employed labourers, called compositors, to set the type. Some printing presses were using automatic machinery, whereas some printing presses used manually operated treadle machines.

The same phenomena was found in other units also. Some industrialists proudly claimed that they used extremely modern plant and machinery and comparatively newer methods. But most of the units used outmoded equipment and processes of production. At the moment there is abundant labour and
sarcity of capital in Iran. So all entrepreneurs should have used capital light labour intensive plant and equipment and production processes. But actual experience did not confirm to this expectation.

When we talked this over with small scale industrialists, it was found that the range of physical techniques and available machinery was not so wide as supposed. It was much more limited than the normal expectations. In many cases capital saving labour intensive type of equipment was not freely available for sale or perhaps, the equipment may not have been manufactured due to less potentialities of sale. We asked the small scale industrialists whether they would be in a position to import from foreign countries such capital saving labour intensive type of equipment. The replies given by the small scale industrialists were negative. They informed us that most of the equipment available from western countries was capital intensive. In fact, one important characteristic of most of the imported machinery and equipment from developed countries like Germany, Japan, U.S.A. and U.K. was that the equipment had been designed for the high income areas, adopted to the requirements of countries where wages were very high.

We questioned the small scale industrialists as to whether equipment used in western countries in the early stages of their development, when average levels were very
low could be imported. Such equipment would be labour intensive and capital saving. The industrialists informed us that the government of Iran was not permitting such imports. Besides, these items were not being specially manufactured because the demand for such equipment was not sufficient to make the production of such machines profitable to the producers. They said such equipment was likely to show low productivity. The productivity of modern machines has increased greatly due to continuous research and development to create improved machinery. So small scale industrialists would prefer to use new and modern equipment of higher productivity rather than import old out moded equipment of low productivity. Besides, the small scale industrialists did not know whether the government would permit the import of inexpensive spares and components required to maintain imported machinery in working condition. Hence, if replacements were not available on time and skilled technicians were not capable of fitting them properly, second hand machinery would remain idle in the small scale industrial units. Due to this risk, industrialists in Iran choose to import new capital intensive machinery. They felt that in the long run, such modern equipment would be more profitable on account of its lower repair cost and greater dependability. One industrialist informed us that minimum wages adopted in the industries prevented the potential advantages of labour using techniques from being fully realized.
Due to lower wages in the small scale industrial units, the workers in the age group of 16 to 40 look to their jobs in small scale industrial units as stepping stones. They switchover to better paying jobs whenever it is possible for them to do so. This ultimately shows a high labour turnover especially in the age group of 16 to 40. The government should attend to this problem and bring about an increase in the minimum wages in order to give workers the incentive to double their efforts and keep to their jobs. Some small scale industrialists were under the impression that if they interviewed new workers closely and if they learned that their parents and brothers had records of steady employment, they would be able to reduce the labour turnover. But, other industrialists informed us that this was not a solution to the problem. Inspite of careful and detailed interviews, they did not get dependable workers. The labour turnover continued to be high even if the small scale industrialists carefully selected the workers with a detailed study and investigation of their family history.

The cost of training a new worker was considerable in most industries. This investment expenditure meant wastage due to the labour turnover. So the small scale industrialists thought that it was not worth training new workers who were likely to change their jobs in a relatively short period. They preferred to invest in capital intensive equipment which they could retain.
However, import of capital intensive machinery means undue loss of foreign exchange. Therefore, the government should start courses for training of workers and thus, solve the dilemma facing the industrialists.

Discussions with the small scale industrialists revealed that if the plant and machinery were operated more continuously, capital labour ratios could be substantially reduced. Many factories were working for one shift. If the plant and machinery were kept working for all the three shifts, the capital labour ratio would be reduced to 1/3. However, it was found that about 85% factories were working regularly for 1 shift and 15% factories were operating their plant and machinery for two shifts. Not a single factory operated regularly for 3 shifts. If industrialists could be encouraged to keep their factories working regularly for more than one shift, it would greatly reduce labour turnover and increase utilized capacity.

Discussions with industrialists further revealed the multiple shift system increased the man-machine ratio and created more employment opportunities, with the same unit of capital. Besides, the multiple shift system also reduced the total cost per unit of output in the manufacturing of the small scale industrial units. Individual cost per unit of output remained the same, but overheads were distributed over a larger output, when the factories were operated on
multiple shift basis. They reduced the average cost of production and increased the profit margin of the unit. This appeared more significant when the plant and machinery was purchased by the unit on instalment-credit basis, and the unit had to pay relatively large amounts of interest on the medium term loans obtained by the small scale industrialists while purchasing the plant and machinery.

We tried to learn the reason why small scale industrialists were not running their factories according to the multiple shift system. A number of reasons were put before us by the small scale industrialists contacted. They were as follows:

1) The working of most of the small scale industries was largely dependent on the presence of the proprietor. The proprietors themselves were the managers of the small scale industries. In case of partnership concerns in the small scale industrial units, one of the partners was the key man, whose presence was considered to be absolutely essential for the smooth running of the factory. In most of the cases qualified assistance was not available to the key person who was also the proprietor of the partner. Capable and efficient assistance was not available to run the factory in the absence of the manager or key person. If the factory was run on multiple shift basis, it would be a great strain on the entrepreneurs-cum-managers, so, most of the factories worked on single shift basis.
Secondly, we found that the efficiency of labour was greatly reduced in the second shift and more so during the third. This was mainly because most of the workers in the second and third shifts held part-time jobs or full-time jobs also in the same factory or in other factories. So second and third shift labourers, who thus overworked themselves, were too tired to offer their best.

Thirdly, we noticed that the workers in the third shift were required to be paid wages for 8 hrs even if their actual work amounted to 6 hrs only. Rest intervals in the other shifts were responsible for this. Besides, lack of transport, customs and habits of the workers also presented difficulties in the operation of the factory on a multiple shift system.

We inquired about the reason why labourers were asked to work overtime. Most of the industrialists stated that according to the factory act provision, workers had to be paid at a rate which was twice the regular rates. Therefore, many industrialists asked the workers to do overtime for one or two hours, but this time was not recorded in the muster and the workers were paid at regular rates for the work done by them during the overtime.

Thus, it is essential to replace the overtime system by multiple shift basis in the interest of the workers also. It is important for government officials to
concentrate their efforts on overcoming difficulties and psychological resistances coming in the way of operating factories on a multiple shift basis. We hope, that the government officials, industrialists and various associations will try to overcome the problems in running factories on the multiple shift basis. They should also reduce the psychological resistance in the form of customs and habits which come in the way of operating small scale industrial units in this manner.

7.4 Employment Position in Iran Today

Before discussing the ways of implementing labour to save capital, we would like to give a brief resume of the employment situation in Iran today.

After the recent revolution, Iran is faced with an unemployment crisis. The present situation is a result of the condition that existed in Iran during the regime of the late Shah.

Large quantities of oil were being exported and the resulting revenues from these oil sales were being wasted on the import of consumer and other items, see table 1, 2, 3, 4 and 5, land and building dealing and the setting up of assembling industries which imported spares and components from foreign countries, thus benefitting western countries alone. This caused the villagers in Iran to be attracted by the glamour and luxuries of the cities and the better paying
salaries and so they left their homes to find work in the cities. In this way, the agriculture suffered, for there were not many young people left to till the soil. But, now the government has lessened the import of spares and components for assembly industries and put a check on land dealing. So, many of these villagers have lost their city jobs and at the same time they cannot turn to the long neglected agriculture. This is one of the chief reasons for unemployment. The government must encourage the villagers to return to their villages. This is possible through land reforms and the creation of small scale and ancillary industries. Handicrafts and cottage industries should be developed. In chapter four, dealing with handicrafts, we gave a detailed explanation of various villages and the crafts they had to offer. The government should also start mechanical workshops and research centres in larger villages. A number of educated men and women are also finding themselves without work at the moment. This too is a legacy of the late regime when government and public offices employed more people than necessary in order to silence and subdue youngsters and hot heads. With the closing down of many public offices and the laying off of the excess staff, 5/6th of Iran's educated population finds itself jobless. The government should start industrial training courses, whereby the educated unemployed, can get training as skilled and semiskilled workers. Particular attention should be given to the aspect of agriculture.
Trained workers should be advanced loans and encouraged to unite and start co-operative small scale industries. Next, we must deal with the problem of the lower strata of society. They were the ones who involved themselves in the sale of wine, cassettes, lotteries and cigarettes. However, Islamic rule rightly forbids the practice of such activities which bring about the moral degradation of mankind. Thus, these people also find themselves at a loose end without any occupation. The government should absorb them in service, industries. Perhaps they could be grouped together in stalls in the market place and engaged in the sale of consumer items. This would also serve in decreasing inflation. Alternatively, they could be sent to various parts of the city as salesmen. However, care must be taken to avoid the return of villagers and their participation in these activities.

Tribals and gypsies, who mainly concerned themselves with animal husbandry, agriculture and handicrafts, long neglected during the past regime, also find themselves at a loss. The government should help them in re-establishing these industries. The Tribals are famed particularly for the carpet industry which could be combined with animal husbandry and agriculture.

These various categories of unemployed people mentioned above should be aided in solving their difficulties
by the government of Iran. This can be done in part by the following of a definite programme whose aim is to do away with or at least lessen to a great extent the unemployment factor.

We give below a general programme which could be beneficial in erasing unemployment in Iran, through the setting up of small scale industries.

1. Loans should be granted for more labour intensive equipment.
2. Production industries should be increased.
3. Export of raw materials must be stopped and at least semi-finished goods must be exported.
4. Small scale industries requiring the countries own raw materials should be encouraged.
5. Medium and low technology which is labour intensive should be utilized.
6. In villages, agriculture must be encouraged.
7. Ancillary and small scale industries, cottage and handicraft industries should be set up in villages.
8. Artisans should be encouraged to produce spare parts and components for the industries within the country itself.
9. Existing industries should be encouraged to employ more labour.
10. Laying off labour should be prevented.
11. Loans and other facilities should be given to small scale industrialists for the expansion of their industries.
12. Encourage the private sector to invest in more small scale industries.
13. Small scale industrialists with experience should be aided by loans, training and other facilities.
14. There should be prevention of industries going bankrupt.
15. Villages should be studied carefully for the selection of the production of various handicrafts.
16. Training centres for the training of future small scale industry employees should be set up in the villages.
17. Special handicrafts for tribal women such as carpet weaving, knitting and embroidery should be encouraged.
18. Ancillary industries such as those concerned with wiring, plumbing, prefab materials for building and construction industries should be encouraged.
19. Building and construction should be encouraged so far as it is necessary for the people of Iran itself.

7.5 Use of Labour to Save Capital

If additional labour can be used to save on capital and other scarce resources without affecting the quality of the product, labour should be used to maximum advantage. Various technological factors should be studied to decide where such additional labour can be used advantageously and economically.

Size, according to Mr. Barend AdéVries, is an important but not exclusive condition for competitive production. Certain types of capital equipment, sometimes of individual specifications, trucks, generators, and cranes can, if appropriate technology is used, be economically produced in small factories. Technological modifications and innovations based on modern knowledge should be encouraged. However, the innovations involved should be suitable for the conditions in the country in which they are to be put into practice. Attempts should be made to get maximum use out of existing machinery, combining labour with the same amount of capital. Finally, the prices paid for capital and labour by the industrial units should be re-examined with a view to opportunity costs to the society as regards the resources involved.
We feel Iran too could benefit from the above suggestions.

According to Prof. C.L. Barber of the University of Manitoba, a large number of underdeveloped countries prefer to adopt capital intensive techniques when starting on enterprises (ventures) for economic development. This, obviously, creates a dual economy. Highly capitalized industries mushroom up amidst technically primitive labour intensive agriculture and industry. The increase in the total production of small scale industries is not corresponding with the increase in employment of labour. Current research and emphasis on capital intensive labour saving machinery and equipment is perhaps responsible for this state of affairs. We discovered that an increasing number of industrialists were replacing labour by more efficient machinery.

The situation described above is presently taking place even in Iran.
<table>
<thead>
<tr>
<th>Revenues</th>
<th>1977</th>
<th>1979</th>
<th>1980</th>
<th>Percent (change)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Revenues</td>
<td>2,034.2</td>
<td>100.0</td>
<td>993.2</td>
<td>100.0 -21.7 - 2.1</td>
</tr>
<tr>
<td>From Oil &amp; Gas</td>
<td>1,497.8</td>
<td>73.63</td>
<td>565.8</td>
<td>61.12 73.53-15.9 17.7</td>
</tr>
<tr>
<td>From Taxation</td>
<td>443.6</td>
<td>21.81</td>
<td>349.5</td>
<td>29.71 168.3 22.10 -33.8 -27.2</td>
</tr>
<tr>
<td>From other Sources</td>
<td>92.8</td>
<td>4.56</td>
<td>77.9</td>
<td>7.84 71.3 9.17 33.3 4.37 - 8.5 -53.3</td>
</tr>
</tbody>
</table>

(+) Oil Revenues only.

Source: Bank Markazi Iran (The Central Bank of Iran) Bulletin No. 185 and 186, 1st and 2nd quarter - year 1359, P. 20.
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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Imports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Million dollars</td>
<td>6,614</td>
<td>11,696</td>
<td>12,766</td>
<td>14,566</td>
<td>10,280</td>
<td>9,717</td>
<td>-29.4</td>
<td>-5.5</td>
<td>3,287</td>
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<tr>
<td>Billion Rials</td>
<td>488.1</td>
<td>800.9</td>
<td>901.7</td>
<td>1,029.2</td>
<td>725.8</td>
<td>686.0</td>
<td>-29.4</td>
<td>-5.5</td>
<td>231.5</td>
</tr>
</tbody>
</table>

Source: Bank Markazi Iran Bulletin No. 185 & 186 year 1980 P. 146.
### TABLE NO. 3

#### Composition of Imports

<table>
<thead>
<tr>
<th></th>
<th>1973</th>
<th>1974</th>
<th>1975</th>
<th>Percent change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Value</td>
<td>Share</td>
<td>Value</td>
<td>Share</td>
</tr>
<tr>
<td>Total Imports</td>
<td>3,737.1</td>
<td>11,695.6</td>
<td>77.0</td>
<td>76.8</td>
</tr>
<tr>
<td>1. Intermediate goods</td>
<td>2,273.7</td>
<td>6,212.3</td>
<td>87.6</td>
<td>45.6</td>
</tr>
<tr>
<td>2. Capital goods</td>
<td>906.0</td>
<td>3,488.2</td>
<td>46.9</td>
<td>162.1</td>
</tr>
<tr>
<td>3. Consumer goods</td>
<td>557.4</td>
<td>1,995.1</td>
<td>82.3</td>
<td>96.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>1973</th>
<th>1974</th>
<th>1975</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Food &amp; Live animals</td>
<td>327</td>
<td>852</td>
<td>1,555</td>
</tr>
<tr>
<td>2. Beverages &amp; Tobacco</td>
<td>5</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>3. Raw non-food materials excluding fuel products</td>
<td>189</td>
<td>344</td>
<td>369</td>
</tr>
<tr>
<td>5. Vegetables &amp; animals oils and fats</td>
<td>61</td>
<td>240</td>
<td>291</td>
</tr>
<tr>
<td>6. Chemical Products</td>
<td>356</td>
<td>649</td>
<td>835</td>
</tr>
<tr>
<td>7. Goods which are classified according to their primary materials</td>
<td>1,252</td>
<td>2,198</td>
<td>3,342</td>
</tr>
<tr>
<td>(paper ... non metal)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Transportation, Machinery &amp; Tools</td>
<td>1,403</td>
<td>2,109</td>
<td>4,973</td>
</tr>
<tr>
<td>9. Miscellaneous</td>
<td>130</td>
<td>196</td>
<td>288</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3,737</td>
<td>6,614</td>
<td>11,696</td>
</tr>
</tbody>
</table>

### TABLE 5

**Origin of Imports to Iran**

(Million dollars)

<table>
<thead>
<tr>
<th></th>
<th>1973</th>
<th>1974</th>
<th>1975</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Value</td>
</tr>
<tr>
<td>America</td>
<td>598.2</td>
<td>1,461.4</td>
<td>2,516.6</td>
</tr>
<tr>
<td>Europe</td>
<td>2,218.8</td>
<td>3,363.7</td>
<td>5,874.3</td>
</tr>
<tr>
<td>Asia</td>
<td>803.3</td>
<td>1,613.7</td>
<td>3,006.6</td>
</tr>
<tr>
<td>Africa</td>
<td>48.00</td>
<td>80.1</td>
<td>76.0</td>
</tr>
<tr>
<td>Australia</td>
<td>68.7</td>
<td>95.1</td>
<td>222.1</td>
</tr>
<tr>
<td><strong>Total Imports</strong></td>
<td><strong>3,737.1</strong></td>
<td><strong>6,613.7</strong></td>
<td><strong>11,695.6</strong></td>
</tr>
</tbody>
</table>

**Source:** Foreign Trade Statistics of Iran
Bank Markazi Iran Bulletin
year 1975 p. 62.
In table 2 we see that before the revolution imports from foreign countries increased every year.

Table 3 shows the type of imports, 53.1% were intermediate goods, 29.8% capital goods and 17.1% were consumer goods. Fortunately, after the revolution, since 1978, there is a decrease in imports. In 1978 the decrease in imports was 29.4% and in 1979 5.5% as compared to the years 1977 and 1978 respectively.

Table 4 gives us more details of imports during the previous regime.

Table 5 shows the various countries which exported goods to Iran in the past. In 1975, 50.22% was imported from Europe and 21.52% from America. This means 71.74% was being imported from America and European countries. In the year 1977, Iran's revenue from oil and gas was 1497.8 billion rials (Table I). In the same year Iran's imports were valued at 1029.2 billion rials (Table 2). This shows Iran's dependency on imports and also the fact that most of Iran's revenues went back to foreign countries through the practice of importing before revolution.

7.6 Developing Appropriate Technology

We mentioned earlier that some small-scale industrialists had installed imported modern machinery and equipment. This equipment was automatic and semi-automatic, and
widely used in western countries. When new and up-to-date machinery was not available, many small scale industrialists imported outmoded machinery, yet other units used the old tools and simple machinery and equipment.

Obviously, Iran needed new machinery and equipment which would be different from that needed by the handicraft and cottage industries on one side and the large scale factories using the latest capital intensive techniques on the other. The machinery should be more productive than traditional equipment and more labour intensive than the modern capital intensive techniques of production used in developed countries. The new machinery should cost less than that which is presently available in highly developed countries. Machinery and equipment must be developed which would be inexpensive enough to be available to a large number of entrepreneurs in the small scale industrial sector. This should not make too great a demand on the savings of foreign exchange resources in Iran. During the last few decades, technology has progressed tremendously, especially in the countries like Japan. I would be incorrect to advise small scale industrialists in Iran to use outmoded machinery which is regarded as unsuitable for the more developed industrialised countries should be imported only as an occasional phenomena. It would be better to discover machines and methods of work which would be more suitable
to conditions in Iran. Such machinery can be evolved by using modern knowledge to renovate Iran's old traditional methods or by working on the latest equipment used in advanced countries, and modifying them to suit conditions in Iran or thirdly, by analysing technological problems in Iran directly in their own industrial developmental and research institutes.

Industrialists in the small scale sector explained to us that development of intermediate technology was very difficult in manufacturing which involved handling of temperature, or pressure or heavy materials or chemical transformations. But there was ample scope in the metal working industries like manufacturing of bushing, carburators, Balls, Pistons, metal hoses, tubings, castings, special dies, tools, gauges, industrial moulds etc. Modern machinery and tools yielded a good volume of production through repeated performance of standardised operations. Some industrialists informed us that many products were produced economically on tools which were of moderate cost.

We suggest that the government of Iran and the industrialist pay sufficient attention to small metal working plants which offer good opportunities for the development of intermediate technology and systematic research programmes.
Institutes in foreign countries have possibly created certain machinery and equipment which can be easily adopted to suit circumstances in Iran. Certain foreign technical journals also are being published periodically from time to time with the results of the operational research carried out in their institutes. Contacts should be maintained with such institutes in other countries and technical journals published in various countries should be studied so that the inventions of other countries can be considered and duplication of inventions of the same machinery and equipment could be avoided.

It must be observed that this type of intermediate technology is required in many of the under-developed countries in Asia, Africa and Latin America. So enterprising industrialists, who could take up the production of such equipment, would have much demand from these different countries for a long time. Much opportunity lies ahead of us and we trust that entrepreneurs in Iran would take advantage of the possibilities of such schemes of production. The future of a country's small scale industrial sector depends on how quickly and efficiently modern technology is adopted and adapted by the industrial sector. It is time for the small scale industrial sector in Iran to take a stand in modern technology. It is here that technologists could play an important part by imparting their knowledge and skill to the small scale industrial
Technologists in Iran should persuade the small scale industrialists to utilize their talents and skills for the betterment of society in general and for the development of the small scale industries in particular. They should form a forum. The forum conducted by Shri V. B. Salunke of India, maintained the following objectives:

1) To bring together young industrial technologists from various industries in the country.

2) To offer a common ground for free exchange of ideas regarding development of small scale industries, particularly with a view to raise technological standards and efficiency.

3) To build a cadre of technologists with entrepreneurial skills, who are willing to offer voluntary services, skills and knowledge for the benefit of the needy small scale industrialists in the country.

4) To carry out such activities as the preparation of schemes and pamphlets, industrial extension services in factories and offer advice to the government on technical problems that may be referred to them.

5) To build up a library of technical literature useful for small scale industrial units.
6) To organise meetings and seminars on different technical subjects of interest to different categories of industries.

The forum may start various panels for different industries such as mechanical industries, engineering industries, electrical industries, metallurgical industries and chemical industries.

Panels should meet at different factories periodically and discuss the problems of technology. The small scale sector is just emerging and it is hoped that it will in time successfully achieve its ambition of adopting the modern technology in the industries in Iran and of accelerating the growth of the small scale sector.