Some Thoughts of Importance for setting up of small and medium scale Chemical Industries such as phosphate fertilizer industry in Sri Lanka

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INTRODUCTION

Industries can be categorised broadly into there main groups depending on the extent of capital expenditure incurred. These are namels small, medium and large scale industries. Small and medium scale industries can be generally defined as those which operate with working capital not exceeding 6 to 10 million Rupees. Industries which require expenditure more than 10 million Rupees are known as large scale industries.

Chemical industry irrespective of the scale of manufacture, generally embraces a wide range of manufacturing industries from consumer products to speciality chemicals/materials in addition to servicing and licensing. It is observed that developed countries are shifting their manufacturing activity from commodity products to speciality products. There seems to be very promising opportunities for the developing countries to enlarge their commodity products manufacture for export and/or local markets. This paper outlines the factors which could influence the viability of small and medium scale industries of manufacture of commodity chemicals such as phosphate fertilizers.

MARKETING AND CONSTRAINTS

Viability of an industry is generally a function of the production capacity and many other factors. It is well known that higher the production rate of a given industry, the more its economic attractiveness or viablity. Larger production rates reduce the overhead costs and energy wastages per unit weight of production. Higher production rates require higher capital investments and the necessity to capture large markets for products. Sri Lanka being a country of small geographic coverage with relatively limited population has got only limited markets locally for chemical and allied products. There are many industries, specially many chemical industries, which become unviable if designed to cater the limited local market only. Many chemical industries require export planning if such industries are to become viable.

Large scale production require export markets, for its products to be disposed of. Export markets generally demand high quality products. Quality of products specially in chemical industry cannot be achieved by employing low level technology in manufacture. Quality is generally linked with proper control of process parameters and shift of manual handling to automation. Such a trend generally reduces the employment opportunities which could be deterimental to developing countries like Sri Lanka. However, it should be noted that development could be aimed at maximising income per capita with less manpower contrary to some beliefs that development can be achieved by maximising income per capita with maximum manpower.

One major drawback of large scale chemical industry is the possible dominance of foreign interests is such industrial ventures. Such dominance could arise due to one or more of the following.

(1) Lack of Capital of Local Counterparts
This could lead to over-shadowing of local interests by foreign collaborators leading to foreign dominance and exploitation of profits and assets to foreign lands.

(2) **Lack of Local Expertise in Machinery and Processes Technology**

This leads to local entreprenuer entering into committments with foreign parties for payment of royalties and licensing fees. In addition, monopoly of manufacture of certain types of machineries by foreign parties leads to exhorbitant price tagging of machinery and spare parts.

(3) **Monopoly of Marketing by Foreign Agnecies**

Clusters of agencies generally operate in international trade for marketing of many chemical products. As a result the local producer could face with incapabilities to obtain the real market value for the products. The products of third world countries are generally sold at substantially lower prices compared with the world market prices.

LOCAL CONSTRAINTS

In addition to the aforementioned points, several other factors solely based on local parameters also govern the viability of an industry. These are outlined in figure 1, which shows the manner in which the rate of return of a project depends on other project parameters. The obvious step in making a project viable is to increase the net profit and reduce the total investment. The net profit is the difference between the gross profit and BTT on sales. Higher the BTT on sales lesser viable the project is.

BTT on Sales

BTT levied on sales of three chemicals including phosphate fertilizers are shown in Table 1.

Table 1

BTT on Sales of Some Chemicals

Chemical	BTT %
(a) Phosphate Fertilizer	3%
(b) $CaCO_3$ precipitated	10%
(c) Sodium Thiosulphate	10%

Table 2

STATISTICS OF REPRESENTATIVE TRIPLE SUPER PHOSPHATE PROJECTS (BASED ON 1987 COSTS)

1. Production rate T/a Triple Superphosphate	1000	2000	5000	10,000	40,000
2. Annual Sales Revenue @ Rs.4200/- per Tonne	4200	8400	21000	42,000	168,000
3. Operational Cost	3652	6831	16452	32,329	125,200
4. Profit before Taxes - Sales-Operational Cost.	548	1569	4548	9,671	42,800
5. BTT on Sales 3%	126	252	630	1,260	5,040
6. BTT as a percentage of profit	23.0	16.0	13.8	13.0	11.8
7. Gross Profit before incometax	322	1317	3918	8,411	37,760
8. Taxes	116	613.5	1914	4,160.5	18,835
9. Nett Profit	206	703.5	2004	4,250.5	18,925
10. Total Investment	5601	8805	16851	27,782	83,786
11. Return on investment %	3.7	8.0	11.9	15.2	22.6
12. Return on Investment if BTT is exempted	4.1	8.4	13.2	17.2	25.5

(Costs are expressed in Thousands of Rupees)

Table 2 shows how the BTT charged could effect a small and medium triple superphosphate industry. It can be seen that higher the production capacity, less dominant the detrimental effect of BTT levy on the viability of the project.

This is to be expected as the increase in annual expenditure with increase in the capacity of a project generally overrides the negative effect of BTT corresponding to the increased sales revenue. This leads to smaller industries becoming unattractive compared with the corresponding larger units.

However, the extent of the gross profit too can be made to dominate in overall profits of a project. The gross profit is determined by the difference between the sales revenue and the annual expenditure of the project. The annual expenditure is the total value of annual depreciation of machinery, salaries, services and raw material costs. Profits can be increased by reducing the annual expenditure. This could be achieved by lowering the annual depreciation of machinery, salaries, services, and raw materials costs.

Annual depreciation of machinery could be reduced by increasing the life of the plants and in the meantime reducing the cost of machinery. Good quality materials of required specifications and regular maintenance of machinery lead to prolonged life of plants. Imported machinery generally costs high compared with locally manufactured machinery. However, lack of technical responsibility and sometimes even lack of skill of local manufacturer of chemical plants can override the abovementioned benefit of low cost of local machinery. This can be expected due to the lack of established experienced chemical machinery manufacturers in Sri Lanka.

On the other hand an entreprenuer embarking on specialised chemical machinery construction in Sri Lanka will have to meet the challenge of high overhead costs of research and development leading to high cost of his product. It is well known that Eppawela Apatite which could form a base raw material of a fertilizer industry in Sri Lanka is characterised of a fluorchlor apatite with high Silica contents. As a result, high abrasiveness of local apatite and high corrosiveness of fumes discharged from reactions are problems which need special studies. It is therefore appropriate that subsidies either by the State or by an International Development Agency be given for industries for research and development.

SERVICES

Primary services that are required by chemical and fertilizer industries are water, electricity and fuel.

Phosphate fertilizer industries generally require water for dilution of reactants, scrubbing, for reaction and granulation. Availability of water is an important factor which should dominate in selection of a location for such an industry.

Constant power, supply is an important factor for a healthy chemical industry. Phosphate conversion industries require un-interuppted and reliable power supply. A power failure could lead to interuption of flow followed by hardening of lumps of reaction mixtures of fertilizers making them permanent or hard lumps within flow paths. Such hard lump formation require cleaning of flow ducts, additional crushing equipment and high power costs.

Market Prices and Import Duty of Raw Materials

Raw materials required for a chemical industry can be either from local sources or by imports. In the case of phosphate industry, primary local raw material is the rock phosphate. The fertilizer Secretariat of Sri Lanka fixes the price of this commodity from time to time. This commodity is liable for BTT levies at the purchase points.

Imports are generally the reactant acids and other fertilizer additions. Sulphuric Acid, Hydrochloric Acid, Phosphoric Acid, Nitric Acid are the general reactant acids for the industry. The prices of acids are governed by the world market prices. However, Sri Lanka has got the advantage of purchasing such chemicals at a considerably low prices from markets in India.

All imports of chemicals are subjected to import duty and BTT. Import Duties of some selected chemicals are shown in Table 3 below

Table 3

Import Duties levied for some selected Chemicals

1.	Chlorine	100%
2.	Bleaching Powder	5%
3.	Crude Sulphur	5%
4.	Inorganic Acids (general)	Duty Free.
5.	Oxygen	35%
6.	Alchohols and Ether	60%
7.	Metallic Ores	5%
8.	Ester, Ketones etc.	60%

The author's experience in project studies of Chemical Industries has revealed that salaries of workers form a major portion of the annual expenditure budget. The higher the production capacity of a project less dominant the relative salary component is. As a result, small scale projects based on three shifts could become less attractive compared with single shift projects of same capacity. The savings in salaries by designing a small scale project on a single shift basis compared with a multi-shift basis could exceed the losses incurred by daily closing down and start up of such an industry. However, it has been seen that this argument rarely applies to large scale industries where manpower requirements are relatively small as a result of automation.

GOVERNMENT SUPPORT

Loan Schemes

SMI (Small and Medium Scale Industries) loan schemes are made available by the International Development Agency through the Government of Sri Lanka for the local entrepreneur to assist in setting up of small and medium scale industries. The loans are generally limited to approximately four million Rupees. As outlined earlier elsewhere, chemical industries such as fertilizer industries generally require larger capital expenditure requirements compared with many other industries. As such, limitations of loan amounts granted under SMI schemes are seen to be inadequate for setting up of viable small and medium size projects of chemicals and fertilizer manufacture.

Export Promotion

As a result of limited low production rates in the case of small and medium chemical industries compared with larger industries, the local small scale entrepreneur can find difficulties in disposing his limited production stocks to export markets.

A larger scale industry on the other hand have got the double advantage of securing export markets for his sustantiate quantities of production stocks while receiving all other benefits offered to exporters. The benefits offered to export industries are as follows.

a. Tax holidays.

b. Duty free imports of machinery and raw materials.

c. Export Development investment support schemes, (EDISS)

Under this scheme exporters receive grants.

d. Concessionary interest rates on finances.

e. Equity participation by the Export Development Board.

f. Free tranfer of profits and funds.

As een from the above, the small and medium scale industries based on local markets do not receive such benefits as above. These industries neither receive rebates on BTT and other taxes nor are able to obtain relief on import duties.

CONCLUSION

As a result of the above discussion, it can be seen that many aspects affecting setting up of chemical and fertilizer industries exist, which require special attention and consideration by the relevant authorities concerned, in order to promote small and medium scale chemicals and fertilizer industries in Sri Lanka.