

Plastics Processing in Bangladesh

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ABSTRACT :

In Bangladesh no polymer is manufactured for plastics products and all the activities in this field involved are on processing but the level of technical know how and the machinery used are of low standard and the information about the present situation is very sketchy, incomplete and unreliable. A survey has been made to have a better idea about the present situation, problems and finally some suggestions have been made for improving them.

Introduction :

In the last few decades use of plastics has increased so much that in many countries of the world the volume of its use comes next after concrete, steel and wood. This is due to its high strength to weight ratio, low cost, resistance to corrosion, electrical and heat insulation, ease of molding, ease of obtaining desirable properties appropriate for required uses and good aesthetic appearance. The use of plastics is steadily increasing in developing countries, one example of which is shown in Table 1.

Year	Sales (billion lb.)
1960	5.5
1965	10
1972	24
1980 (est)	45

Table 1 : Sales of plastics in U. S. (Source : Ref-1)

Compared to the developed countries consumption of plastics in Bangladesh is very low. Nevertheless the use of it has increased in the last few decades and still has a rising trend. The import figure (Table 2) would give some idea about the demand although complete and accurate data could not be obtained.

Year	Amount (tons)
1961-62	1100
1964-65	4100
1966-67	12000
1968-69	15000
1969-70	17000
1979- 80	2000

Table 2 : Imported Amount of Plastics

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The figure to a great extent is affected by the government policy on import of plastics raw materials and processing machinery. But there are scope of increasing the consumption of plastics products by replacing and supplementing the metal products which in some cases may involve more cost including the requirement of foreign reserves. If the cost of the product can be decreased people of lower income group will also help to increase the consumption figure. There will be more demand of products molded in Bangladesh if the functional quality and aesthetic appearance of the products can be improved. There are scopes to do this and for identifying the different factors survey on the processing industry was carried out. The data has been presented in a concise form for giving an overall picture of the situation prevailing in Bangladesh. The knowledge of this situation is important for future planning in this respect.

Procedure :

Before carrying out the visits to different industrial units some information regarding the names and addresses of different industrial units, statistics related to raw materials in respect to the whole country were collected from different government and semi-government organisations (2-6). A questionnaire was then prepared to record relevant information and the procedural details are given elsewhere (7).

Types of Industry :

Information from different sources, op. cit. indicate that at present there are about 200 units in Bangladesh involved with the processing of plastics partly or wholly. Examples of later categories are electrical appliance manufacturers etc. About 144 of these units are privately owned. There are other very small unregistered units who have locally made hand operated small machines. Some estimates put the number between 200 and 250.

The units mentioned above are not of the same size. Some facts about them can be presented by placing them into three categories namely: (1) Large size industries (2) Medium size industries and (3) Small size industries. The capacity of production of the different units for which data was available have also been used to find out the number of industries falling into different ranges as shown in Figure 1.

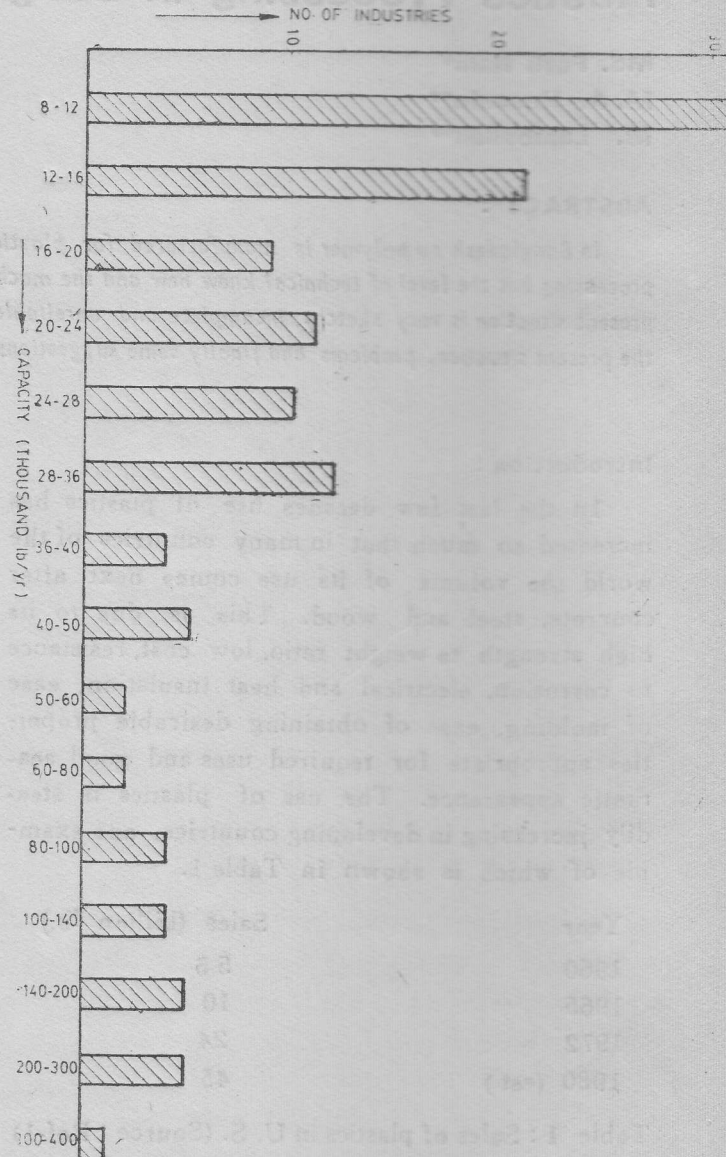


Fig. 1 No of Industries of different capacity ranges

Large size industries are either privately owned or belong to the corporations like Bangladesh Chemical Industries Corporation (BCIC), Bangladesh Steel and Engineering Corporation (BSEC). These units are equipped with imported automatic machines like injection moulding machine, blow moulding machine, compression moulding machine and extruders for making pipes, compounds, coating cables, wires and cloth. These units have their own workshop facilities for repairing and maintenance of their processing line. Several units were visited and three of these units have been compared as shown in Table 3 to have a closer look at the large sized units. Dies and moulds are costly and the big size units often use high quality imported ones. Even a small comb mould when imported can cost more than Taka one lac. Local dies and moulds are cheap but the quality is not very good and the life is not very long. Most of these units have several small departments like Production, Accounting, Store, Workshop, Maintenance, Selling and Advertisement. Only few have show rooms of their own and selling expenses of the most units of this category vary from Tk-3,000-Tk.25,000 per year.

Medium size industries use mostly locally manufactured manual machines or low capacity imported automatic machine and are owned by private entrepreneurs. Two units from this category have been selected for a closer study and the related data are shown in Table 4. These units generally do not have their own workshop. For maintenance work they go to nearby way side workshops and thus avoid investment to some extent. The number of workers is much less compared to large size industries and generally vary around 10. For lowering the cost of the products few of them use recycled raw materials to some extent. This sometimes affect the quality of the product but may not be realized when the product is new. Most of the

moulds and dies used by the units in this category are locally made. The inventory of finished product and raw materials is very small, and storing, selling and account recording take place simultaneously in a single room. Advertisement cost is almost nil and personal relationship with known people help to obtain orders from within a small region around the factory.

Small size industries invariably use cheap locally made hand operated machines and are privately owned. The machines have no good instrumentation. In most cases they use recycled materials to a great extent. They use locally made small cheap mould and dies which are nickel coated in every three months. They don't have any workshop or auxiliary machine of their own. The blow moulding machines have cycle tube pumper for the supply of compressed air. Extrusion machines are not found in the industries in this category. The number of workers in this category of industries is more than the medium size industries in some cases. Since all the machines are manuals at least one operator is required for each machine. Some female workers are also employed at a lower wage for washing the recycled crushed raw material. No advertisement cost is involved and separate departments do not exist. Figures related to two units are shown in Table 5.

Consumption of raw Materials

All the thermoplastic and thermoset raw materials are imported but some cellulosic product is made by a unit belonging to one corporation. So the import figure gives a good idea about the consumption which in 1979-80 was 20,000 tons as shown in Table 2. Among the different types of plastics PVC and Polyethylene are mainly consumed, the percentage use of which is shown in Figure 2 together with other raw materials. The different uses of these two important raw materials (PVC and PE) are shown in Figures 3 and 4 respectively.

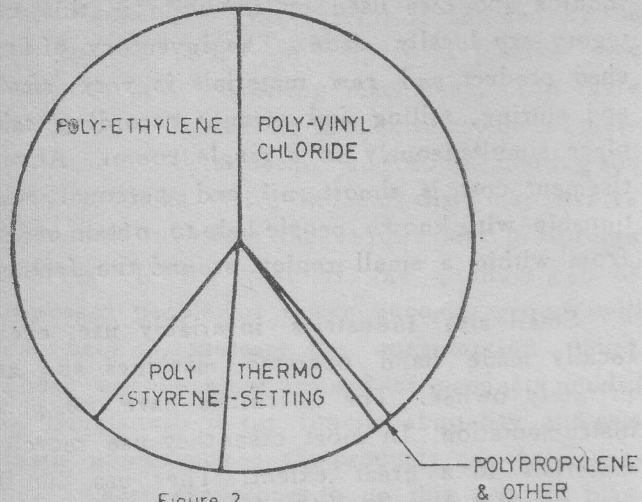


Figure 2
Proportion of different raw materials used

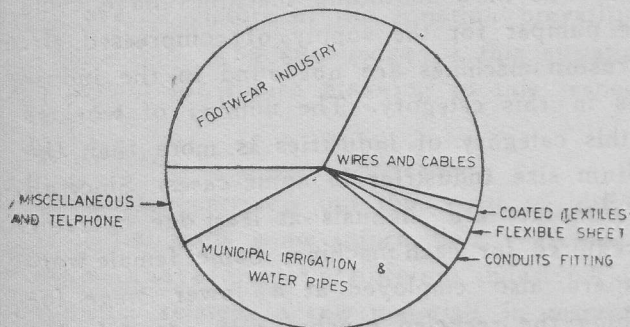


Figure 3
Proportion of different uses of PVC

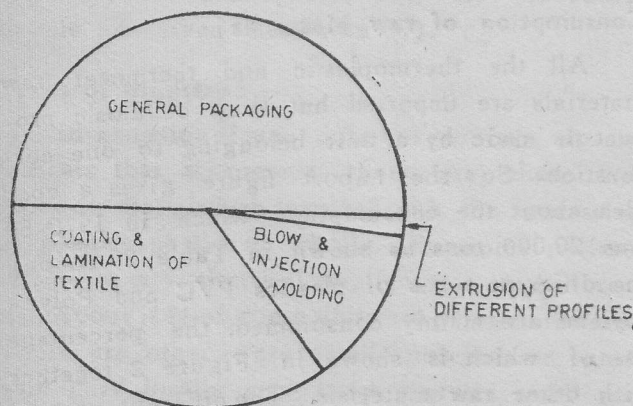


Figure 4
Proportion of different uses of polyethylene

Large size industries have advantages of procuring their raw materials from big suppliers or importers. In the local market virgin Polyethylene costs about Tk. 18 per lb. and shoe grade PVC costs about Tk- 16 per lb. Medium and small size industries use recycled materials to some extent and the cost of this material is about Tk. 9 per lb. The recycled material comes from crushed used polyethylene bags, old PVC shoes etc.

Future use of raw Materials

There are several fields where the use of plastics products may rise to a great extent. Specially PVC pipes and fittings may find more use in different projects to be implemented by Bangladesh Agricultural Development Corporation (BADC), Water and Sewerage Authority (WASA), Public Health Engineering (PHE), Titas Gas Transmission & Distribution Co. Power Development Board may also find more use of plastics for the distribution boxes. Due to increase in the production of cables and wires PVC demand for coating is also rising. The increase in demand of PVC pipes due to BADC and WASA requirements is expected to be over 15,000 tons in near future. Similarly Polyethylene is finding more use as packaging material and coating of wires. More textile and jute industries are switching over to plastic components such as bobbins, picklers' sliver cans etc. The use of plastics are also increasing for many other items such as toys, electrical appliances, household products, office stationary etc. But there are some drawbacks and difficulties for producing cheap and better products which will be discussed below.

Different Problems and the efforts needed to overcome them

The proper and economic application of plastics materials in different fields is of prime

Table 4: Some details of two medium size units

Unit No.	Ownership	Products	Production Volume (tons/yr)	Machinery used (No.)	Origin of M/C.	Cost of installed machinery (Lac Taka)
1.	Private	Canes, Belts etc.	35 ¹	Extruder(3)	Local	1
2.	Private	Shoe	50	Injection Molding	Japan	25

Table 5: Some details of two small size units

Units No.	Products	Production Volume (thousand lb/yr.)	Machinery Used (No.)	Origin of Machinery	Cost of installed Machinery (thousand Taka)	Wage of workers (Tk. /Month.)
1.	Salt Container, Small Bottles	10—16	Hand operated Injection(3) Blow Molding(2)	Local	38	600—800
2.	Handle of baskets, Tobacco leaf Container, Tooth Power, Container Toys	2—20	Hand operated Injection 6)	Local	36	600—800

importance. Since the raw materials are imported and taxes are paid the processors need to pay high cost for procuring them. The decision to set up a polymerisation plant in the country will not be a easy one. The economic production capacity of such a plant is very high and the requirement in Bangladesh is low. The export possibility is also not very good. In the international market multinational companies have many advantages and their investment is also very high. But in Bangladesh there is a scope of economic analysis to find out more applica-

tion of plastics materials. Many non plastics materials for industrial and household use are imported. It is needed to see which material would help reducing the foreign currency requirement. Also the finished product cost should be found out to see whether plastics can replace or supplement traditional materials keeping the prime objectives in mind. Previously picklers used to cost Taka 80 per piece but locally made plastics picklers cost around Taka 45. Based on the above findings taxes can be levied so that the country gets the maximum benefit.

Table 3 Some details of three large size units.

Unit No.	Ownership	Products	Production Volume (tons/yr)	Machinery Used	Type of Machines (and no.)	Origin	Cost of installed machinery (Tk. in Lac.)	Machinery in workshop, (Tk. in Lac.)	Investment for workshop (Tk. in Lac.)
1.	Private	House hold & industrial products (plate, cup, bucket, glass, picklers toys etc.)	200-300	Injection Molding, Blow Molding, Compression Molding	Automatic(2) Hand operated(15)	Japan Local	10	Lathe, Drills, Grinders	2
2.	Corporation	i) Films & Bags ii) PVC com-pounds iii) PVC pipes	i) 10 ii) 200-300 iii) 5	Extruders	Automatic(7)	Japan	30	Lathe, Grinders	1
3.	Corporation	PVC pipes & fittings.	400	Extruders Injection	Automatic(3+1)	Japan	60	Lathe Drills Grinders	2

Table 3: Contd.

Unit No.	No. of workers Skilled	Unskilled + Temporary	Average Salary (Taka/month)	Other facilities to workers	Advertising cost (Thousand Tk./yr.)
1	10	20+25	1100	Food and Residence	5-7
2	11	9+3	1100	Uniform, Refreshment, Bonuses	5-7
3	12	21+15	1100	Uniform, Residence, Medical	50 (approx.)

Many products made by small and medium size industries are not aesthetically attractive and the quality is poor. The manual machines have no instrumentation to hold the temperature and pressure at the required value which is very important to get good quality products. Degradation, loss of surface quality, strength and durability are some problems. Even the simple requirements during the processing are unknown to many operators. The knowhow about the process variables for different materials and products should be enhanced. And further study is required to find out means of adding cheap and acceptable instrumentation for existing manual machines.

The locally made cheap dies and moulds are also not helping to obtain nicely finished products. On the other hand imported moulds sometimes cost several times more than the cost of machines of medium and small size industries and so that will not be helpful if one wants to keep the price of products low since the consumption rate is not very high. Therefore technical skills must be developed for the production of dies and moulds. This skill would be useful for other fields as well.

The frequent power failure is another serious problem because not only production time is lost but raw materials degrade to some extent and need to be discarded in many cases. And in addition to that some time is lost for the cleaning operation. Proper uninterrupted power supply should be ensured otherwise the cost per product is bound to rise.

Conclusions

The processing industry in the country is not very big but prospects of more use of plastics products exist. Some pricing and technical problems hinder the the production of cheap and

better products. Importance should be given to the necessity of keeping relevant upto date data by personnels in industries and related organisations. Some study to help taxing rules, more efforts to increase technical knowhow of personnels and to improve the control of machineries at reasonable cost are required. Accurate collection of latest information and access to them are required for the above mentioned studies.

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