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Prospects and Challenges of Plastic Industries in Bangladesh

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Abstract

Plastics are versatile materials. They have good physical properties and economic features such as light weight, attractive color, ease of processing, non-rusting property and low cost. As a result, many house hold and technical items which were used to be made of metal, wood, clay, etc. are now being made of plastics. Although the per capita consumption of plastic in Bangladesh is 5 kg per year which is quite low compared to the world average of 30 kg per year, it is expected to increase to 17 kg per year in 2020 current average in ASEAN countries.

The plastic industry has emerged as a vibrant industrial sector in Bangladesh during the last two decades. At present there are 3000 plastic manufacturing units, 98% of which belong to Small and Medium Enterprises (SME's). The plastic sector is also one of the thrust sectors in the Industrial Policy - 2010. Present domestic market size is Tk. 7,000 crore. The plastic sector provides employment of half a million people and constitutes 1.0 percent of the national GDP. A number of plastic items are directly exported to different countries and total earning for both direct and deem (RMG accessories) exports is about US $ 337 million.

Recycling of used plastics is very important form both environment conservation and resource sustainability reasons. Availability of cheap labor has enabled this sector to use recycling quite extensively in Bangladesh. Even then, more extensive recycling particularly for mixed plastics using modern techniques is highly recommended.

Although the future growth of plastic sector is very promising, an in-depth study reveals multi-dimensional constraints. Lack of trained and skilled man-power, testing facilities for operation, maintenance and mold making and international certification are the major constraints in this sector. An institutional arrangement dedicated to plastic sector to provide supporting services such as skilled manpower, testing facilities for quality control, certification, innovative technology and consultancy services is needed. This paper recommends the setting up of Bangladesh Institute of Plastic Engineering and Technology (BIPET) in this regard. The structure and objectives of the proposed institute is in the light of Indian experience.

Non-availability of good quality molds is a big constraint in plastic sector. The country lacks both the required machineries and skilled man-power in this regard. Upgradation of mold design facilities of BITAC is recommended. BCSIR can upgrade its Polymer Division for international certification of plastic products.

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1.0 Global Plastic Industry

Plastic replace other common materials such as metals and wood in numerous applications because of their low cost and characteristics. Plastics offer several advantages in production as they are easily softened or melted, and can be molded into any shape. Manufacture of plastic goods has been increasing due to low production costs and energy efficient production processes. As a result the global production of plastic goods has increased from a mere 1.5 million MT in 1950 to 230 million MT in 2009. Fig. 1 illustrates this exponential growth over the past 60 years.

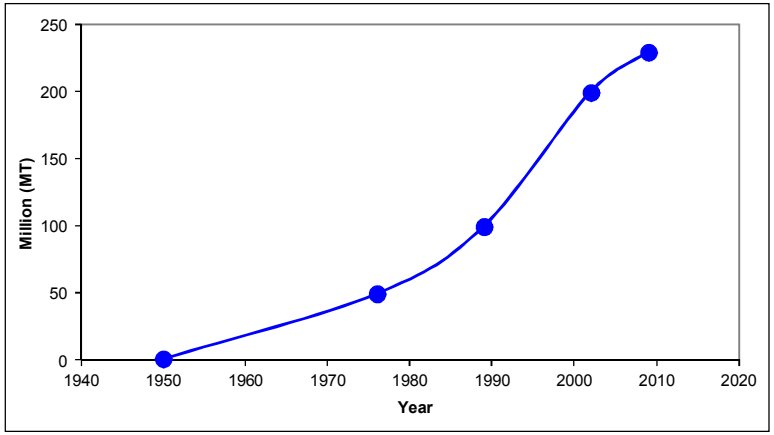

Fig. 1: Global production of plastic products

Sources: Plastic Europe-2010 and UN-ESCAP Report-2012

Global production of plastic products is dominated by developed countries of North America and Europe (47%). China is the largest producer of plastic

products (15%) among developing countries. Fig. 2 shows the global market share in 2009 of plastic production for different countries.

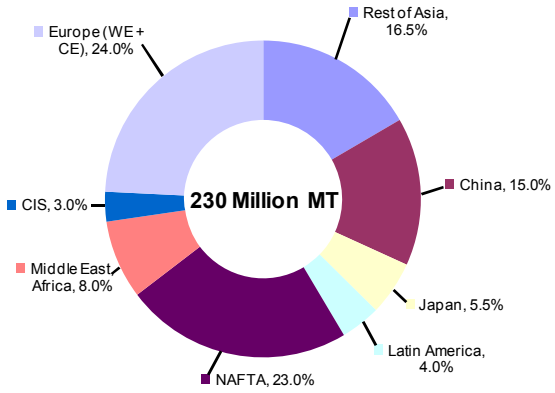

Fig. 2: Market share of global plastic production in 2009

Sources: Plastic Europe-2010 and UN-ESCAP Report-2012

At present plastic/polymer consumption is a measure of per capita GDP in a country, Fig.3. From this figure it can be seen that per capita consumption in India, lags well behind China and Brazil. The position of Bangladesh will be discussed in next section.

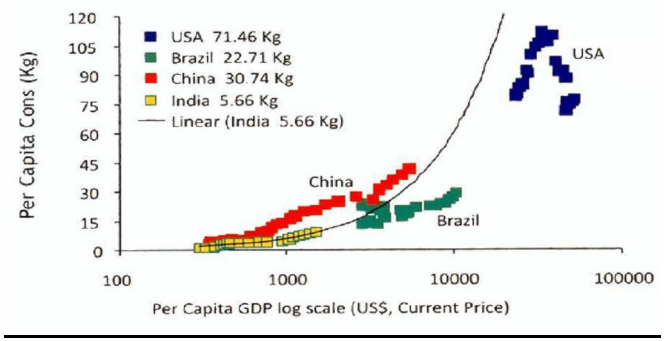

Fig.3: Per capita polymer consumption vs. per capita GDP of selected countries (2009) (**Ref.** Chemical and Petrochemical Manufacturers' Association, India)

2.0 Growth of Plastic Industry in Bangladesh

The plastic industry is relatively new compared with the textile and leather industries. The plastic industry began its journey as a small industry in 1960's. The industry experienced an important growth with the introduction of injection and film grade machines in 1980's. Since early 1990's the plastics industry witnessed a rapid growth due to introduction of free market economy. Since the country does not have polymers production, required polymers are imported. Table-1 shows the growth trend of imported polymers, the basic raw materials for plastic goods production. Over the period of last 20 years, the polymers import increased from around 14,000 MT in FY 1990 to 696,500 MT in FY 2011.

Polymers import data in Table-1 are depicted in Fig. 4 showing an exponential growth. A growth rate curve of 20% (base year 1990) is also depicted in this figure. As can be seen from this figure, import data of polymers for the period FY 1990-2011 fit well with the 20% growth curve. The project demand of polymers in 2020 is 3.4 million tons which is quit high. For a reasonable growth rate of 15% after 2011, the projected demand of polymers in 2020 will be 2.4 million tons. This value is in agreement with the estimated quantity based on current per capita consumption of 17 kg/yr polymers in ASEAN countries.

Table 1: Import of Polymers in Bangladesh, Period FY 1990-2011

Financial Year	Import Quantity (metric ton)		
	Bonded category	Non-Bonded category	Total
1989-1990			14,021
1990-1991			15,262
1991-1992			22,165
1992-1993			39,880
1993-1994			66,421
1994-1995			11,981
1995-1996			103,454
1996-1997			51,384
1997-1998			86,318
1998-1999			59,515
1999-2000			--
2000-2001			--
2001-2002	74,637	121,532	196,169
2002-2003	60,606	126,571	187,177
2003-2004	57,477	157,053	214,530
2004-2005	85,365	295,168	380,532
2005-2006	80,628	193,246	273,874
2006-2007	103,853	184,611	288,464
2007-2008	97,772	199,005	296,777
2008-2009	98,708	250,416	349,124
2009-2010	179,688	414,152	593,840
2010-2011	215,644	480,896	696,540

Sources: FY 1990 - FY 1999 (BBS), FY 2002-2011 (NBR, BPGMEA)

Note: Apparent per capita consumption of imported polymers is 4.6 kg/yr. Recycled plastic granules used in plastic industries is 20%. Per capita consumption of imported and recycled polymers is about 5 kg/yr.

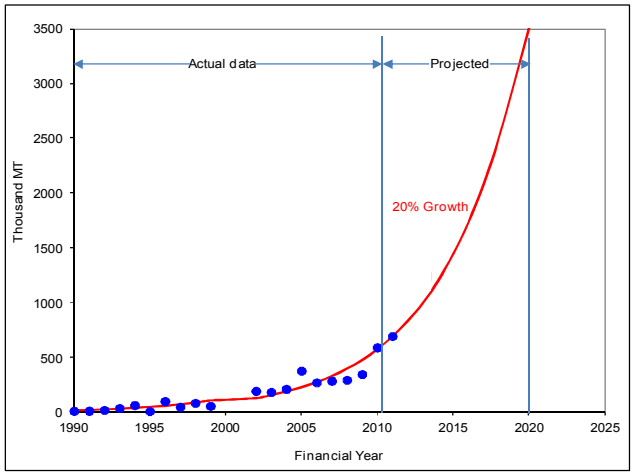

Fig. 4: Statistical data on import of polymers.

Sources: FY 1990 – FY 1999 (BBS), FY 2002 – FY 2011 (NBR, BPGMEA)

Per capita apparent consumption of polymers including bonded and non-bonded categories in FY 2011 was about 5.0 kg/year. This data along with per capita consumption of polymers for selected countries, including ASEAN and world are illustrated in Fig. 5. Per capita consumption of Bangladesh lags well behind world average of 30 kg.

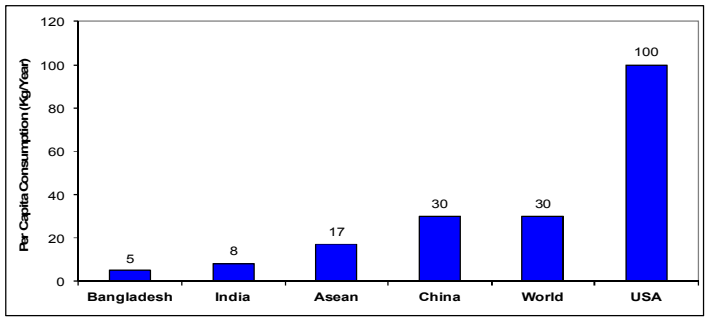

Fig. 5: Per capita consumption of polymers: Bangladesh vs Global

Sources: Kapur and Shashikant-2011, Bangladesh: Estimated using NBR data.

3.0 Prospects of Plastic Industry

The plastics industry is a dynamic industrial sector in the country. At present domestic market is Tk 9,000 crore and export market including direct export of plastic goods and deemed export of RMG accessories is Tk 2,700 crore. This sector constitutes 1.0 percent of GDP and provides employment to half a million people.

Export Earnings: Bangladesh is making an effort to diversify its export items. Plastic products have a large potential for export diversification. The direct export of plastic goods has been on the increase every year during the last decade as depicted in Fig.6. An average growth rate is 20 percent per year.

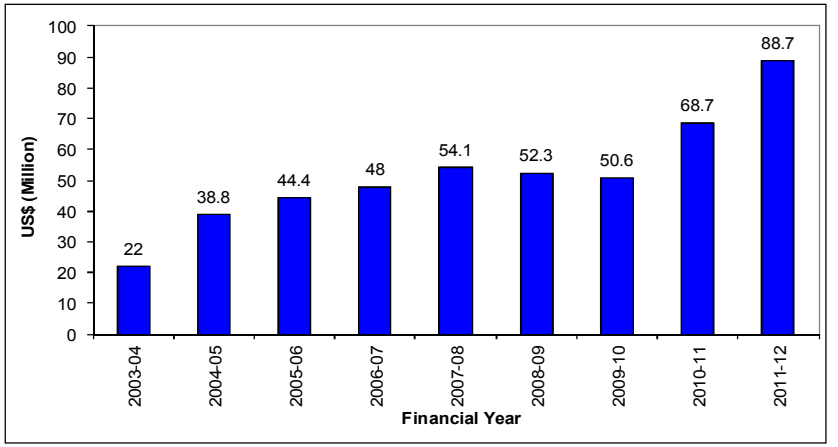

Fig. 6: Growth of direct export of plastic goods during FY 2004-FY 2012.

Source: Export Promotion Bureau.

Raw Materials: There is no production of polymers in Bangladesh. The plastic industry uses imported raw materials of polymer granules. However, this is not a disadvantage.

Competitiveness: The availability of cheap labor and the fast developing recycling industry of post-consumption plastic wastes in Bangladesh are potential advantages to provide competitiveness in the global market (Katalyst-2005)

Access to Market in Developed Countries: Recently developed countries have opened their market for plastic products from developing countries, like Bangladesh. This shift is due to the low cost of production in developing countries with cheap labor and low transportation costs (Jahan and Khan-2012).

Market Size Potential: As Bangladesh is moving towards industrialization, the plastic sector will become important for manufacturing sector. At present per capita consumption of polymers in Bangladesh is 5 kg/year as compared with the global average of 30 kg/year. The per capita consumption of ASEAN countries is 17 kg/year, (Fig.5). If we aspire to become a middle income country by 2021 and attain per capita consumption of 17 kg/year for ASEAN countries, then the size of the plastic industry will be 2.5 million tons/year compared with 0.7 million tons/year in 2011 (Table-2), an increase of 3.6 times. The UN-ESCAP Report-2012 also forecasts that the present turn over of the plastic sector US $ 1 billion will become US $ 4 billion in 2020.

Table-2: Market size Potential for Plastic Sector of Bangladesh in 2021.

Year	Polymer Consumption (tons/yr)
1990	14,000
2011	700,000
2021	2,500,000 (Present per capita consumption of 17 kg/yr for ASEAN countries)

4.0 Challenges

Some of the large-scale plastic industries have demonstrated capability to be world class in terms of technology, product quality and costs in the country. However, there are 3000 plastic manufacturing units of which 98% belong to the Small and Medium Enterprises (SMEs). The major challenge facing this sector is to make the SMEs competitive in the global market by upgrading them in terms of innovative technology, products diversification and operation costs.

Recently, the SME Foundation has conducted a study on the "Challenges and Opportunities of Plastic Sector in Bangladesh" (Islam-2012). The findings of this study was presented by the author in a "National Consultation Meeting on SME Development: Plastic Sector" on July 11, 2012 in SME Foundation. The problems and recommendations are described below.

Major Problems: Technical Support Services

- Skilled manpower development
- Trouble shooting in operation of processing machines

- Mold/Die design and manufacture
- Testing laboratories for quality control services

Other Issues:

- Lack of an Institute of Plastic for training skilled workers and technicians, and products diversification.
- Uninterrupted power supply in plastic industries
- A plastic industrial park for relocating small plastic factories of old Dhaka City.
- Infrastructure development to set up plastic wastes recycling industry.
- Lack of long-term planning
- Establishing national brands
- Government policy must be consistent

5.0 Recommendation to set up an Institute of Plastic (Bipet)

Lack of technical support services mentioned above is due to the absence of an institute of plastic in the country. BPGMEA recognized the need for such an institute as early as in 2002. In that year, Export Wing Chairman of BPGMEA stated that:

"Bangladesh does not have a proper school for plastic. To attain efficiency and support our industry we need to have a proper polymer institute and a modern testing laboratory for quality test" (Shahedul Islam, Plastic Fair-2002)."

The author of this paper presented the idea of establishing an institute of plastic named as the "Bangladesh Institute of Plastic Engineering and Technology" (BIPET), in a day-long seminar of the SME Foundation attended by experts from BPGMEA, BUET, BCSIR and BITAC in 2008. This idea to set up BIPET was finalized in a consultation meeting of the stakeholders on October 11, 2012. The SME Foundation has already initiated the feasibility study for the development of Project Proposal (PP) of BIPET through Chemical Engineering Department, BUET.

The structure of the proposed BIPET will be in line with the Indian experience of CIPET (Central Institute of Plastic Engineering and Technology). The CIPET has over 40 years experience with 15 full-fledged regional centres in India. Major activities of BIPET will include but not limited to:

- Academic Programs
- Technology Support Services
- Research & Development

Academic programs will include short-term certificate courses, diploma and postgraduate degree in plastic engineering and technology. Technological support services will provide the mold/die design and manufacture, CAD/CAM services, testing of raw materials and plastic products for quality control, technology upgrading and consultancy services. R & D activities are to be conducted for products diversification, waste management and environmental aspects of plastics for sustainable development.

The plastic industry is relatively new in the country compared with the textile and leather sectors which have well established institutional arrangements. Hence the plan to set up BIPET is an ambitious project. It is proposed to set up BIPET in two phases:

Phase-1: Small institute in a rental building

Phase-2: Full-fledged institute in own campus

The establishment of BIPET would require a close cooperation between SMEF (Ministry of Industries) and BPGMEA.

6.0 Conclusion

- This paper has presented an overview of the plastic industry: Bangladesh vs Global.
- The compilation of statistical data on the import of polymers in Bangladesh during the period FY 1990 - FY 2011 showed that the import of polymers was mere 14,000 tons in FY 1990 which has increased to 697,000 tons in FY 2011. Thus current per capita consumption of virgin polymers is about 5 kg/yr against world average 30 kg/yr.
- Market size potential of plastic industry in Bangladesh in 2020 is estimated as 2.5-3.3 millions tons. The average increase is 4.2 times compared with 0.7 million tons in FY 2011. UN-ESCAP Report-2012 predicts that the current turn over of US $ 1 billion would be US $ 4 billion in 2020, that is, an increase of 4 times. This information will be useful for the long-term planning of the plastic industries in the country.

- **Establishment of an Institute of Plastic (BIPET):** SMEF and BPGMEA have initiated the preparation of Feasibility Study/Project Proposal (PP) of BIPET through Chemical Engineering Department, BUET.

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