Study on Environmental Management and Performance of Central Effluent Treatment Plant at Dhaka Export Processing Zone

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Abstract: The Bangladesh Export Processing Zones Authority (BEPZA) is the official organ of the Government of Bangladesh to promote, attract and facilitate foreign investment in the Export Processing Zones (EPZ). The primary objective of an EPZ is to provide special areas where potential investors would find a congenial investment climate free from cumbersome procedures maintaining all environmental aspects accurately. The export processing industries in Bangladesh has experienced an unprecedented growth over the last three decades and become a fast growing industry in Bangladesh. This industry plays a vital role in the country in terms of export earnings, employment generation, poverty alleviation and empowering women. For development of this sector, Bangladesh needs to emphasize on the factory working environment, social issues, labor relations and compliances with codes of conduct. In order to minimize environmental pollution due to small and medium scale industries in DEPZ cleaner production technologies and formation of waste minimization circles are being encouraged. Besides, collective treatment at a centralized facility, known as the CETP is considered as a viable treatment solution to overcome the constraints associated with effluent treatment in small to medium enterprises. A best environmental management practice (BEMP) is defined as the most effective way to implement the environmental management system by organizations in a relevant sector that can result in best environmental performance under given economic and technical conditions. This study serves to bring environmental best practices from an international perspective to DEPZ enterprises as well as highlight those enterprises within the EPZ that already exhibit some best practice techniques within their operations. The study report is based in part on environmental survey that was conducted at the 12 selected enterprises and practices that were observed there.

Key words: Environment, Management, Performance, Practices, Monitoring, Pollution and Effluent.

Introduction

Bangladesh is traditionally an agriculture based country. Simultaneously this is also true that Bangladesh is on the way to be known as an industrialized country in the coming years. The initiative for such industrialization started in 1978 with the readymade garments (RMG) sector and in recent years expanded its area in jute. Among a good number of factors that contributed to the growth of this industrialization to adopt environmental management practice because of its link with not only legal issues but also with market demand and stakeholders proposal. At the same time less productivity and high lead time in comparison to other competing nations despite relatively low wages are the consequences of a lack of proper compliance.

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In order to stimulate rapid economic growth of the country particularly through industrialization, the Government has adopted an open door policy to attract foreign investment in Bangladesh. The export processing industries in Bangladesh has experienced an unprecedented growth over the last three decades and become a fast growing industry in Bangladesh. The industry plays a vital role in the economy in terms of export earnings, employment generation, poverty alleviation and empowering the woman. For development of this sector, Bangladesh needs to emphasize on the factory working environment, social issues, labor relations and compliances with codes of conduct. In order to minimize environmental pollution due to the small and medium scale industries in Dhaka Export Processing Zone (DEPZ) cleaner production technologies and formation of waste minimization circles are being encouraged in Bangladesh. Besides, collective treatment at a centralized facility known as the Central Effluent Treatment Plant (CETP) is considered as a viable treatment solution to overcome the constraints associated with effluent treatment in small to medium enterprises. Till 2011, only one CETP at DEPZ was in operation having a capacity of 43000 cum/day. The concept of CETP was adopted to achieve end of the pipe treatment of combined wastewater to avail the benefit

of scale of operation. In addition, the CETP also facilitates in reduction of number of discharge points in an industrial estate for better enforcement and also to make skilled man power available for proper treatment of effluent.

Methodology

The nature of this study is descriptive. So instead of doing any survey or using sampling method observation and selective questionnaire method is used to complete this qualitative research. Most of the necessary information has been collected by physical visit, personal investigation with employees. Both descriptive and inferential research were conducted to identify environmental compliance practices in Dhaka EPZ industries such as sound pollution, noise pollution, air pollution, wastewater, occupation health and safety, effluent treatment, sludge management, in-house working environment, employee benefits and environmental management policies in DEPZ industries. The organizational part of this study is mainly based on secondary data. These data were gathered from different published materials, reports, service rules, annual reports, prospectus and websites.

Dhaka EPZ at a Glance

An export processing zone (EPZ) is defined as a territorial or economic enclave in which goods may

be imported and manufactured and reshipped with a reduction in duties and or minimal intervention by custom officials (World Bank, 1999). EPZ provides:
Plots/ Factory building in custom bonded area, Infrastructural facilities, Administrative facilities, Fiscal and non fiscal incentives.
Location:
Located at Savar, 35 km from Dhaka city centre, 25 km from Hazrat Shahjalal (R) International airport, 304 km From Chittagong sea port.
Type of investment in DEPZ:
100% foreign ownership= 205 Nos. (58%)
100% local venture= 98 Nos. (28%)
Joint venture= 49 Nos. (14%)
Profile:
Zone Area= 361 Acres.
Number of industrial plots= 102.
Size of each plot= 2000 sqm.
Total standard factory building = 17 Nos.
Space of standard factory building= 108,850 sqm.
Tariff= US$ 2.75/sqm/month.

Utility Services

Water supply: Own water supply system at a tariff Tk. 22.43 /cum

Gas supply: From Titas gas transmission and distribution Co. Ltd. At a tariff Tk. 6.45 /cum

Power supply: 11 KV, 3 phase, 50 cycles per second at tariff Tk. 6.11 /kWh

Results and Discussion

Environmental Clearance Certificate (ECC):

Orange B and Red category 12 industries were surveyed and found a regular practice of renewing their ECC annually from department of environment (DOE) as shown in table 1. All these enterprises are maintaining an EMP which is an integral requirement for obtaining an ECC from DOE.

Table-1: ECC validity status of selected enterprises in DEPZ.

Name of enterprise	Status of ECC	Practice of status (%)
EOS Textile Mills Ltd.	Updated to 2014.	95
Savar Dyeing and Finishing Industries Ltd.	Updated to 2014.	88
Savar Sportswear Company Ltd.	Updated to 2014.	85
Shanta Wash works Ltd.	Updated to 2014.	90
YKK Bangladesh private Ltd.	Updated to 2014.	95
Youngone Hi tech Sportswear Industries Ltd.	Updated to 2014.	90
Youngone Synthetic Fiber Products	Updated to 2014.	85
Gameen Knitwear Ltd.	Updated to 2014.	87
Softex Sweater Industries Pvt. Ltd.	Updated to 2014.	90
Avent Garde Fashion	Updated to 2014.	85
Sangnam Textiles Mills Ltd.	Updated to 2014.	93
Shine Fashion Company Pvt. Ltd.	Updated to 2014.	88

Source: Field Survey, 2014.

Table-2: Concentration level of effluents of different industries.

Name of Enterprise	March,2014			April, 2014			May,2014		
	pH	TDS mg/l	DO mg/l	pH	TDS mg/l	DO mg/l	pH	TDS mg/l	DO mg/l
EOS Textile Mills Ltd.	7.6	1700	4.6	7.0	1800	5.1	6.3	1900	4.1
Savar Dyeing and Finishing Industries Ltd.	7.0	1900	5.1	6.8	1600	6.7	7.2	1600	7.1
Savar Sportswear Company Ltd.	6.9	1200	4.8	7.4	1400	6.6	7.7	1800	5.6
Shanta Washworks Ltd.	6.0	1450	5.6	7.5	1300	4.8	8.1	1480	5.8
YKK Bangladesh Pvt. Ltd.	6.5	1360	4.9	8.0	1600	4.7	7.1	1550	6.7
Grameen Knitwear Ltd.	8.1	1100	5.8	7.4	1200	6.4	6.7	1050	6.5
Softex Sweater Ind. Ltd.	6.9	780	7.1	6.4	700	5.8	7.9	650	6.6

Source: Field Survey, 2014.

Table-3: Status of Sludge Concentration.

Name of Enterprise	Arsenic mg/l	Barium mg/l	Cadmium mg/l	Chromium mg/l	Lead mg/l	Mercury mg/l	Selenium mg/l	Silver mg/l
EOS Textile Mills Ltd.	0.2	40	0.04	0.01	0.01	0.001	0.05	0.03
Savar Dyeing & Finishing Industries Ltd.	0.6	35	0.06	0.01	0.02	0.002	0.06	0.05
Shanta Wash works Ltd.	0.3	35	0.00	0.02	0.01	0.005	0.03	0.03
YKK Bangladesh Pvt. Ltd.	0.6	57	0.04	0.05	0.06	0.002	0.02	0.01
Graeme Knitwear Ltd.	0.5	60	0.01	0.8	0.01	0.001	0.07	0.02
Soften Sweater Ind. Ltd.	0.1	24	0.01	0.3	0.01	0.000	0.05	0.01

Source: Field Survey, 2014.

Table-4: Air Emission and control status.

Name of Enterprise	March,2014		April,2014		May, 2014	
	General Air Emission (Times)	Control Measure (Times)	General Air Emission (Times)	Control Measure (Times)	General Air Emission (Times)	Control Measure (Times)
EOS Textile Mills Ltd.	4	3	5	6	6	6
Savar Dyeing & Finishing Industries Ltd.	3	3	3	4	3	5
Savar Sportswear Company Ltd.	5	7	8	3	7	4
Shine Fashion Co. Pvt.Ltd.	3	8	5	3	4	8
Shanta Wash works Ltd.	5	9	2	4	5	6
YKK Bangladesh Pvt. Ltd.	2	6	6	7	3	5
Youngone Hitech Sportswear Industries Ltd.	6	5	4	3	2	8
Youngone Synthetic Fibre Products	7	7	3	5	6	7
Grameen Knitwear Ltd.	4	3	2	5	2	2

Softex Sweater Ind. Ltd.	2	2	3	2	3	5
Avent Garde Fashion	2	1	4	1	5	3
Sangnam Textiles Mills Ltd.	4	5	2	4	6	3

Source: Field Survey, 2014.

Table-5: Sound level status.

Name of Enterprise	Noise at Day Time(dBA)	Noise at Night(dBA)
EOS Textile Mills Ltd.	87	45
Savar Dyeing & Finishing Industries Ltd.	88	65
Savar Sportswear Company Ltd.	70	34
Shanta Wash works Ltd.	79	45
YKK Bangladesh Pvt. Ltd.	73	60
Youngone Hitech Sportswear Industries Ltd.	75	55
Youngone Synthetic Fibre Products	80	40
Grameen Knitwear Ltd.	85	34
Softex Sweater Ind. Ltd.	70	60
Avent Garde Fashion	65	45
Sangnam Textiles Mills Ltd.	83	38
Shine Fashion Co. Pvt.Ltd.	65	28

Source: Field Survey, 2014.

Table- 6: Status of Solid Waste Management.

Name of Enterprise	Mach, 2014			April, 2014			May, 2014		
	Good	Moderate	Poor	Good	Moderate	Poor	Good	Moderate	Poor
EOS Textile Mills Ltd.		√		√				√	
Savar Dyeing & Finishing Industries Ltd.	√			√			√		
Savar Sportswear Company Ltd.		√			√				√
Shanta Washworks Ltd.	√				√		√		
Shine Fashion Co. Pvt. Ltd.	√	√	√	√	√	√	√	√	√
Shanta Washworks Ltd.	√				√			√	
YKK Bangladesh Pvt. Ltd.	√			√			√		
Youngone Synthetic Fibre Products		√			√			√	

Source: Field Survey, 2014.

Table-7: Status of Hazardous Waste Management.

Name of Enterprise	Arsenic mg/l	Barium mg/l	Cadmium mg/l	Chromium mg/l
EOS Textile Mills Ltd.	0.001	12	0.002	0.002
Savar Dyeing & Finishing Industries Ltd.	0.003	16	0.006	0.003
Savar Sportswear Company Ltd.	0.001	05	0.006	0.004
Shanta Washworks Ltd.	0.002	10	0.007	0.004
YKK Bangladesh Pvt. Ltd.	0.005	06	0.008	0.001
Youngone Hi tech Sportwear Industries Ltd.	0.001	09	0.005	0.001
Youngone Synthetic Fibre Products	0.003	17	0.002	0.005

Grameen Knitwear Ltd.	0.005	25	0.004	0.003
Softex Sweater Ind. Pvt. Ltd.	0.006	18	0.001	0.001
Avent Garde Fashion	0.003	14	0.002	0.001
Sangam Textiles Mills Ltd.	0.000	35	0.001	0.002
Shine Fashion Co. Pvt. Ltd	0.000	20	0.004	0.000

Source: Field Survey, 2014.

Table-8: Status of Sewage Concentration

Name of Enterprise	BOD mg/l	Nitrate mg/l	Phosphate mg/l	Suspended mg/l	Temperature ^{o}C	Coliform ml
EOS Textile Mills Ltd.	24	150	15	2	23	450
Savar Dyeing & Finishing Industries Ltd.	33	180	21	3	22	543
Savar Sportswear Company Ltd.	27	123	17	1	20	670
Shanta Washworks Ltd.	32	139	23	4	26	370
YKK Bangladesh Pvt. Ltd.	30	178	22	2	27	530
Youngone Hi tech Sportwear Industries Ltd.	24	140	28	6	21	456
Youngone Synthetic Fibre Products	26	160	30	7	17	654
Grameen Knitwear Ltd.	19	158	28	2	26	700
Softex Sweater Ind. Pvt. Ltd.	23	156	31	3	15	800
Avent Garde Fashion	27	180	26	6	19	690
Sangnam Textiles Mills Ltd.	32	172	21	2	16	450
Shine Fashion Co. Pvt. Ltd	33	154	24	4	28	600

Source: Field Survey, 2014.

Environmental Monitoring Report in DEPZ Industries

It is badly required to understand more thoroughly the actual condition in the context of environmental issues that required compiling the management desire, monitoring and also enforcement. Observations from field survey for a period of three months from March, 2014 to May, 2014 are presented in table 9.

Table-9: Environmental compliance practices and monitoring in DEPZ industries.

Name of Enterprise	Category of Enterprise	Status of ETP	Status of Effluent Treatment	Status of solid waste	Status of joining to CETP	Remarks
Shanta Washworks Ltd.	Red	Present	Good	Good	Agreed to join	Management is always concerned about standard.
EOS Textile Mills Ltd.	Red	Present	Good	Moderate	Disagreed to join	Management is always concerned about standard.
Savar Industry Pvt. Ltd.	Orange B	Absent	NA	Poor	Connected to CETP	They are unaware about the issues. After counseling they are a bit convinced.
Young A Textile Co. Ltd.	Red	Absent	NA	Poor	Connected to CETP	Fire and health safety management can be made better by installing evacuation plan.

Savar Sportswear Company Ltd.	Orange B	Absent	NA	Moderate	Connected to CETP	One of the better factories regarding environmental compliance, scope of improvement in energy efficiency.
YKK Bangladesh Pvt. Ltd.	Red	Own ETP	On operation	Good	Not connected	Try to comply with ISO level.
Grameen Knitwear Ltd.	Red	Own ETP	On operation	Good	Not connected	Given full effort to comply all requirements.
Softex Sweater Ind. Pvt. Ltd.	Orange B	Small ETP	On operation	Good	Not connected	Additional desire to ensure EMS practice.
Avent Garde Fashion	Green	NA	NA	Good	Not connected	Take positive initiative to improve the system
Sangnam Textiles Mills Ltd.	Orange B	NA	NA	Good	Not connected	Try to comply ISO standard
Shine Fashion Co. Pvt. Ltd.	Orange A	NA	NA	Good	Not connected	Trying to fulfill the buyer's needs in all respects.

Source: Field Survey, 2014.

Conclusions and Recommendations

With a view to check and prevent air, water and groundwater pollution arising out of industrial areas following are some of the recommendations made based on the study and practical problems of existing rules and regulations.

i) Adequate steps should be taken to fully comply with the Government standard to prevent air, water and groundwater pollution.
ii) All the required anti pollution measures to be installed should conform to comply the effluent and emission standards prescribed by the concerned Government agencies.
iii) In the Environment Protection Act 1996 and Environment Protection Regulation 1997 there is no clear statement to carry out the Initial Environmental Examination (IEE) and/or Environmental Impact Assessment (EIA) while expanding the capacity of production and relocating such industries except only when new establishment is required. This provides great loopholes to the opportunists irresponsible to environment conservation.
iv) Government should act immediately to start compliance monitoring program of the first generation standard so that after some time advance generation standard could be established. The pollution control certification should be granted according to the EPA and EPR provisions.
v) The pollution control certification procedure should be effectively implemented which must be based on the complete environmental examination of all the pollution sources and laboratory analysis. A third party monitoring mechanism including the representative of the local bodies and civil society will be recommended.
vi) There is an urgent need of recruiting relevant personals with related academic qualification in right place and come up with standard laboratory, more stringent policies, standards and regulation of pollution control coupled with plan of actions to achieve it.

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