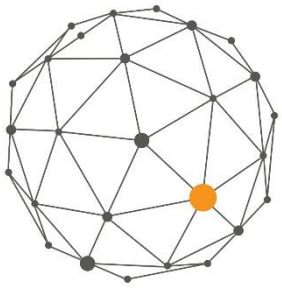

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Questionnaire

Sustainable Manufacturing and Environmental Pollution: A Case Study of Textile and Apparel Sector in Bangladesh

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Export-led industrialization is putting pressure on natural environment and on livelihoods.

Objective: identify / map institutions (industry associations, international organizations) and private sector initiatives (MSME and large enterprises) implemented to achieve a sustainable manufacturing, control pollution and related environmental and health impacts, and also to enhance workers safety.

Research Focus: Export oriented manufacturing enterprises in the textile and Apparel Manufacturing Sector value chain: MSME and large enterprises, known as Readymade Garment (RMG).

Environmental Considerations

1. Business organizations start paying attention to natural environment and the environmental degradation from industrial activities. This is mainly due to government (through legislation), society, domestic and global market pressures. Natural environment preservation, pollution prevention and environmental management initiatives and practices are gaining place. A paradigm change. How this is happening in Bangladesh, particularly the adoption of environmental management initiatives and tools by the private sector?

Answer: The adoption of environmental management initiatives in RMG industries of Bangladesh was initiated due to buyers' demand for sustainable production. This necessity also came from civil society organizations, pressure from donor organization and government (through legislation). The private sector also plays an important role to adopt these environmental management initiatives to increase their business competitiveness in the global market.

The private sector is willingly accepting the sustainable manufacturing and environmental pollution control measures mainly to attract buyers. Low operational cost from adopted environmental management initiative is another motivation to the RMG factories.

Institutional capacity for providing technical services regarding sustainable manufacturing has also increased many folds in last 15 years.

To promote this change government in coordination with donor or international lending organization – like World Bank, Asian Development Bank – providing soft loan with low interest rate.

2. Do global markets exert any kind of pressure to boost Bangladeshi enterprises to change to a sustainable manufacturing? For instance, is there any kind pressure from external bodies, international organizations, international society, foreign buyers (businesses)? If positive, how are they exerting such pressure? Does this pressure impact MSME or only large companies? What are the results of such pressure? Do they give any kind of support to enterprises, particularly MSME (technical, financial)?

Answer: Global markets exert pressure to boost Bangladeshi enterprises to adopt sustainable manufacturing practices. These pressures come from external bodies, international organizations, international society, foreign buyers. In most cases, if the

sustainable manufacturing technique are not adopted, buyers will stop buying or reduce order quantity and the lender will stop lending money.

After the Rana Square occurrence in April 2013, worldwide safety platforms – ACCORD, ALLIANCE, and National Action Plan – were lunched [1]. There are number of industrial facilities, particularly little ones (more precisely, MSMEs) were not able to invest in fire, electrical and structural security up-gradation as per benchmarks prescribed by the security stages, which driven to closer of those production lines [2].

The ACCORD and ALLIANCE have contributed positively to upgrade the electrical, fire and structural safety in RMG sector. After their interventions the frequency and intensity of industrial disasters have reduced drastically.

External bodies, international organizations, international society, foreign buyers do not provide substantial financial or technical support for this kind of changes. They mostly supported the RMG facilities with relevant training and conducted fire, electrical and structural safety assessment.

3. Do importing countries or importing companies require that Bangladesh export enterprises comply with home country environmental regulations and standards? How does this happens? Do they give any kind of financial or technological support?

Answer: Importing countries or importing companies require that Bangladesh export enterprises should be compliant with home country's environmental regulations, importing countries' or importing organization's regulations and other international standards.

In RMG sector, buyers periodically audit the supplier factory to check the compliance with the local regulation as well as with their code of conduct. In an audit from buyer or third party, they always first look at the compliance with the local laws.

At the most basic level, factories must comply with the country's own environmental requirements. RMG factories of Bangladesh already has implemented basic safety features in their factory like alternative stairs, basic fire equipment, approved layout plan from concerned authority for ensuring safe building construction, group insurance for workers, hygienic sanitation facility and first aid appliance, as well as ensuring minimum wages and flexible jobs for the workers [3].

Sometime the buyers or international agencies provide some technical assistance but not the financial assistance to implement environmental pollution control initiative.

4. What are the key drivers to a sustainable manufacturing? International pressure (society, businesses that are customers of Bangladeshi RMG industries)? Cost reductions? Legislation compliance?

Answer: Health safety, environmental and social compliance in RMG sector are advancing issues for Bangladeshi businesses after Tazreen and Rana Plaza disaster. The key drivers for sustainability in RMG businesses of Bangladesh are primarily the requirements from buyers for a sustainable environment (wastewater release, solid and hazardous discharge, air emission and nuisances). Civil society, donor and other international organizations are also pushing RMG industry to adopt sustainable manufacturing process.

Legislative compliance is another major driving force for adopting sustainable manufacturing process.

To sustain this highly competitive market RMG factories are now more concern to cut operational and maintenance cost. Many RMG factories are now investing to the sustainable manufacturing processes because of the low operational cost of those process.

5. Which are the barriers, difficulties, opportunities for MSME and large enterprises to implement environmental management initiatives and tools from the policy and management perspective?

Answer: New investment and operational cost for implementing environmental management initiatives have always been a barrier, especially for MSME as well as for the large RMG factories. However, the compliance issues have interfered with profit margins. The Micro, Small and Medium enterprises (MSMEs) always face difficulties to meet the safety and environmental compliance requirements due to technical and financial in capabilities. Many time MSMEs do not get enough financial assistance from the government to adopt new technology regarding sustainable manufacturing.

Government has imposed high taxes on many technology, service and equipment which are necessary for implementing good environmental management practices. For many technologies (Zero Liquid Discharge) and equipment, local expertise is not available.

Bangladeshi RMG factories are poor in management, efficient management would improve their performance and will cut operational cost [4].

6. Private sector-led initiatives: adoption of pollution prevention practices, environmental management initiatives, tools and their current implementation status by MSME and large enterprises:

Answer: In the RMG sector of Bangladesh, most of the pollution prevention and environmental management initiatives are client or buyer's requirements. For pollution prevention and environmental management, there are some globally or regionally recognized tools like GOTs, ZDHC, Higg Index FEM 3.1 etc. Some of these tools are:

i. Source reduction (raw material substitution, toxic materials reduction, best available technology).

Answer: In recent years sustainable sourcing is getting attention among brands and suppliers. There are different standards for sourcing various types of materials from a sustainable source in terms of both social and environmental sustainability. Some of those standards are ZDHC, GOTS, SAC, Material Sustainability Index (Higg MSI), BSCI, SEDEX, etc.

Most of the spinning, knitting, and knit dyeing mills in Bangladesh are GOTS certified which ensure that their yearn or fabric made from organic cotton. Use of the organic cotton is increased 29% in 2019 compared to the previous year and globally Bangladesh is 2nd in terms of the number of GOTS-certified factories [5]. In Bangladesh, there are 689 GOTS certified facilities in Bangladesh.

Another emerging standard for ensuring sustainable material sourcing is SAC's Higg Material Sustainability Index (Higg MSI) and Higg Product Module (Higg PM). Higg MSI measures and scores the environmental impact of a material like cotton, nylon, polyester, etc. On the other hand, Higg PM measures the environmental impact of a product from cradle to gate [6]. With these tool brans itself source sustainable material and product; and also ensure that their supplier source sustainable material for their product.

ii. Pollution prevention or reduction at the source

Answer: Use of alternative or sustainable chemicals is another way for sustainable RMG production. With the assistance of ZDHC getaway factories, source alternative and sustainable chemicals for their production which are less harmful or toxic to the environment.

In Bangladesh both brands and the factories are working together to reduce environmental impacts by sourcing those materials or products which has less environmental impacts. In the RMG sector of Bangladesh, sustainable sourcing has just started, factories are getting acquainted with new tools and sourcing techniques.

iii. Cleaner production measures

Answer: In the RMG sector of Bangladesh, there are some initiatives and projects on the cleaner production. The most significant project on the cleaner production is the Partnership for Cleaner Textile (PaCT) by International Finance Corporation (IFC). PaCT is working with 338 factories in Bangladesh and has contributed significantly in increasing energy, water and resource efficiency [7][8].

Other than PaCT, some brands have their own initiative for cleaner production like Green to Ware (GTW). Some brands are pushing their supplier factories to go for ISO 14001 or other environmental certification which also contributes to cleaner production.

iv. Eco efficiency

Answer: Same as previous.

v. By products and waste recycling and reuse (on-site and off-site)

Answer: Brands now have started to promote recycled materials. Some denim brands encourage the factories to produce fabric with recycled content like cotton from recycled denim or recycled pet bottles.

The leftover fabrics from the RMG sector are now the source of raw material in Bangladesh. A number of factories are locally producing sleeping mattress from those leftover fabrics. Bangladesh also exports some leftover fabrics and in the fiscal year 2017-18 Bangladesh has exports about USD 65 million [9].

vi. Extended product responsibility (EPR)

Answer: In EPR, factories are obliged to take operational and financial responsibility to manage their waste in a sustainable way. Most of the textile factories in Bangladesh have their own Waste Water Treatment Plant (WWTP) and they bear the cost for the treatment.

Some factories also send sludge from WWTP to cement factory for incineration at their own cost. However, for the other type of wastes, ERP is not evident in Bangladesh.

vii. Reverse Logistics

Answer: This initiative has not been started yet.

viii. Life cycle assessment

Answer: LCA is a new concept in Bangladesh and most of the factory do not have the technical capability to conduct LCA for their product. Now some factories are getting LCAfromvarious tools like Higg MSI and Higg PM [6]. On the other hand, many brands are rigorously conducting LCA for the raw materials of their products.

Another life cycle assessment standard is Cradle to Cradle, many brands like Inditex, C&A are promoting this certification in RMG factories of Bangladesh.

ix. Eco-design (DfE)

Answer: Design of Environment is a trending concept in Bangladeshi RMG sector. Most of the extension and new RMG project are increasingly going for the LEED certification [10].

x. Eco labelling

Answer: RMG factories of Bangladesh are certified with various types of eco labeling or eco scoring system. Most prominent eco labels are OEKO-TEX and GOTS.

xi. Eco labelling: EDP certification

Answer: Not understood.

xii. Clean development mechanism projects

Answer: There is currently no project on CDM in Bangladesh.

xiii. Environmental management system – EMS (certification)

Answer: Many RMG factories specially the large ones have gotten the ISO 14001 (EMS) certification for their facility. Many brands encourage their supplier factories for ISO 14001 certification. However, there is no specific data on how many RMG factories are certified with ISO 14001.

Higg FEM 3.1 also a EMS platform and currently in Bangladesh about 700 factory are using this EMS platform.

xiv. Green Button Certification

Answer: Green Button Certification is a state-owned initiative of Germany. It is not known that how many factories are certifies with Green Button in Bangladesh. There is a project of GIZ in Bangladesh, with the assistance of this project 32 factories already got the certificate.

xv. Oeko Tex Certification

Answer: OEKO-TEX is a registered trade mark, representing the product labels and company certifications issued and other services provided by the International Association for Research and Testing in the Field of Textile and Leather Ecology.

Many brands require OEKO TEX certification for their product and many RMG manufacturing factories are OEKO TEX certified.

xvi. LEED certification

Answer: As per the USGBC [10] there are currently 151 LEED certified (platinum, gold, silver or certified) buildings in Bangladesh and 90 [12] of the certified buildings are RMG factories. Bangladesh has some of the top scored LEED certified buildings. The reason for this trend is facilitation of low interest loan with relaxed condition for the LEED building. Brands also encourage the factories for such kind of certification. Many LEED RMG factory buildings already applied for and are waiting for the LEED certification.

xv. Sustainability reports

Answer: Sustainability Reporting is not very popular among the RMG industry of Bangladesh. As per the GRI database [13], till now only 4 factories have published their sustainability reports, among them only one has regularly publishd their sustainability report. With the PSES program of GIZ, they are supporting 6 RMG and Leather Factories and 5 appeal related Trade Associations to prepare their sustainability reports. However, the sustainability reports prepared with the assistance of this project has not published yet in GRI database.

xvi. Industrial Symbiosis

Answer: During the development period of the RMG sector in Bangladesh, industrial symbiosis was not in focus for both the government and industry owners. There are some symbiotic industries which process the leftover fabrics into different materials.

xvii. Eco industrial parks

Answer: The demand of eco industrial park is increasing rapidly worldwide. It is also a scheme to attract FDI in Bangladesh. Till now Bangladesh did not establish or transform its existing industrial cluster like EPZs in to echo industrial park.

A recent World Bank project in Bangladesh aimed to develop a roadmap for low carbon growth and design an optimal policy framework to facilitate it for Chittagong Export Processing Zone (CEPZ) [14]. A yearly 244 tCO2 in GHG reduction and 331 megawatt-equivalent energy consumption avoidance are expected as an outcome of this project.

xviii. Circular economy.

Answer: The Bangladeshi garment industry has already announced to the world that it is ready to embrace the idea of the circular economy in textile manufacturing. A partnership between the Global Fashion Agenda (GFA), Reverse Resources, P4G and the Bangladesh Garment Manufacturers and Exporters Association (BGMEA)—known as the Circular Fashion Partnership—has been initiated to reduce waste and depletion of natural resources caused by textile manufacturing through supporting the development of the recycling industry in Bangladesh. The Circular Fashion Partnership, which has currently united more than 30 international brands such as H&M, Marks & Spencer, OVS, Bershka, C&A, Kmart

Australia, garment manufacturing companies and recycling firms in Bangladesh, can prove to be the epitome of sustainability in fashion for other leading garment-producing nations such as Vietnam and Indonesia [11].

7. Bangladesh RMG manufacturing sector is dominated by MSMEs. Talk about the adoption of sustainable manufacturing, pollution prevention practices by those enterprises?

Answer: RMG industry has started in Bangladesh as MSME, but they are facing severe problems to survive. In 2012-13 BGMEA has around 6000-member factories and in the year 2013-14 the number has plummeted to around 4000 [20]. As per a recent study of CPD the active member of BGMEA in 2018 is 3856 [15]. MSME RMG factories mainly relied on the subcontracting from larger factories, but now-a-days sub-contracting has got a bad name. Buyers are discouraging subcontracting and the large factories are increasing their capacity. Another big reason of closing down the MSME RMG factories is that they are not technically and financially capable to manage the new and stringent requirement of compliance imposed by buyers. After Rana Plaza collapsed in 2013 and advent of ACCORD, ALLIANCE and national action plan in 2014, small factories could not further invest in safety upgradation and subsequently closed down.

8. For the enterprises that have implemented those initiatives, what drove them? Would they go beyond?

Answer: Most of the enterprises have implemented environmental management and sustainable production to comply with buyer's requirements. The main driving force for reducing pollution beyond legal requirement is the pressure from buyer. Sometimes RMG factories also implement sustainable option to get bank loan with low interest rate. Most of the RMG factories would not go beyond fulfilling legal and buyer's requirement for environmental sustainability.

However, there are few industries who want to compete with the global market, especially with the Vietnam and Chinese markets; and those factories go for sustainable options for their facilities without pressure from buyer.

9. What are the enterprises perception on sustainable manufacturing: an opportunity to cut costs, improve efficiency, competitiveness, reduce environmental and health impacts, international relations or an extra cost?

Answer: Enterprises want to adopt sustainable manufacturing to enhance their competitiveness with the other factories at home and abroad. Most of the factories will not spend the extra money on sustainable manufacturing, if it is not legal or buyers' requirement.

10. Moving from (1) free pollution to (2) pollution control (command and control, compliance with national and international environmental legislation and standards), to (3) pollution prevention, to (4) making the difference, seeing the adoption of environmental management initiatives as a business strategy and competitive advantage. In which step are Bangladeshi RMG enterprises?

Answer: Bangladesh, particularly its RMG industry is in the stage of pollution prevention. Increasing industrialization and lack of waste treatment are leading to major water pollution problem in many parts of Bangladesh, impacting on aquatic ecosystems and the population who depend on them for their livelihood activities. However, Bangladesh has a well-developed set of environmental policies, acts and rules that deal with industrial pollution of water, soil and air [15].

Buyers and sometime the government are trying to push the factories to adopt environmentally friendly technologies and practices for preventing pollution, like use of exhaust gas boilers.

As stated earlier, some large RMG industries have taken the environmental management initiative as their business strategy. They are adopting the environmental management initiative to reduce cost as well as to attract new buyers.

11. Does Bangladesh has environmental programs/ strategies at nationwide scale (for example: pollution prevention and/or cleaner production, industrial symbiosis, eco industrial parks and/or circular economy promotion at country level)?

Answer: Initially Bangladesh has inherited its environmental laws and regulations from British and Pakistan ruling. After independence, Bangladesh has had some really good environmental policies and laws. After the independence of Bangladesh, the overarching environmental policy was "Environmental Policy of Bangladesh – 1992", in 2018

government has amended the previous policy as "National Environmental Policy 2018". This policy addresses 24 broad sectors to address overall environmental issues. Bangladesh has also passed "Environmental Conservation Act – 1995" and "Environmental Conversation Rules – 1997" and these are two basic environmental regulations for Bangladesh. Other environmental policies and regulations are "National 3R Strategy", "Bangladesh Clean Air Rules – 2019 (draft), "Bangladesh Bio Diversity Act – 2017", "Bangladesh Bio Security Rules – 2012" and etc.

Bangladesh is also a signatory number of international conventions and protocols; and has taken nationwide initiatives to achieve goals of those conventions like Montreal Protocol on Ozone Depleting Substances (ODS) that deplete Ozone layer, United Nations Convention to Combat Desertification (UNCCD), Stockholm Convention on the Control of Persistent Organic Pollutants (POPs) [16] and etc.

Bangladesh also has prepared a national five-years plan and in the 8th Five Years Plan (July 2020 to June 2025), climate change, environment, water conservation, energy management and other environmental issues got due importance.

12- Regarding climate change, do RMG enterprises consider / have knowledge about the physical impacts of climate change, the effects on the business, particularly raw materials (ex: cotton) and natural resources (ex: water) availability, and the costs associated to it? Do they have knowledge about the country vulnerability to climate change? If positive, what measures are being taken?

Answer: Recently (2019) BGMEA has signed "Fashion Industry Charter for Climate Action". By joining this initiative, BGMEA has pledged to support implementation of the principles enshrined in the Fashion Industry Charter for Climate Action, in line with the goals established by the Paris Agreement of 2015 [17].

Except some large enterprise, most of the RMG facilities are not very much aware about the physical and economic impacts of climate change to their business. Those factories are also not aware about the upcoming changes in the supply chain due to climate change.

On the other hand, most of brands working in Bangladesh are signatory of "Fashion Industry Charter for Climate Action" and the science-based target initiative will verify the Brand's commitment of reducing GHG from its supply chain. To meet their science-based target, brands are now pushing RMG factories of Bangladeshi to reduce their GHG emission to a substantial level.

Many factories also measure their annual GHG emissions with the help of GHG protocol tools. Many factories also report their GHG emissions in Higg FEM 3.1. Few factories started to disclose their GHG emission data at Carbon Disclosure Project (CDP) Platform.

13. Business awareness and compliance with environmental regulations:

i. Environmental Law compliance?

Answer: Department of Environment (DoE) is the authority to enforce the environmental laws, mainly the Environmental Conservation Act – 1995 (ECA) and Environmental Conservation Rules – 1997 (ECR). Along with ECA and ECR, DoE also enforces other environmental acts, laws and other directives [18].

ii. Environmental Law enforcement by government authority?

Answer: DoE has their offices in all the divisional cities and at 22 districts out of 65. As a technical arm of the Ministry of Environment, Forest and Climate Change, DoE is responsible for environmental planning, management, monitoring and enforcement. DoE has shortage of trained and adequate manpower to perform all of its duties appropriately [18]. DoE regularly visits industries to enforce relevant laws, but the frequency of visit and evaluation is far less then what it should be due to man power shortage.

iii. Department of Environment (DoE) monitoring / inspection?

Answer: For the dyeing mills, DoE requires to test the water air samples in every quarter. The sampling frequency is determined by the authorized officers of respective DoE office.

iv. Monitoring data is shared? Data transparency?

Answer: Monitoring data is shared with the respective factories. Any citizen can apply to know the monitoring information from DoE under the "Right to Know Act – 2009".

DoE has a very robust system to calculate the amount of penalty, in case of noncompliance with the regulation. DoE, in its website regularly publishes the list of organizations who were

penalized. Meeting minute for granting environmental clearance is also published in the DoE website.

It can be said that DoE has a transparent process of environmental clearance, monitoring data and penalty.

v. Noncompliance can be attributed to financial constraints (cost of implementing BAT, technology acquisition, maintenance, operating costs)?

Answer: For the export-oriented industries or RMG factories, non-compliance cannot be attributed to financial constrains specially for the medium to large factories, small factories are likely to face some financial constraints in maintaining legal compliance for environment.

vi. Noncompliance equals fines / penalties application?

Answer: Non-compliance with the Environmental Conservation Act – 1995, Environmental Conservation Rules – 1997 and license condition is subject to penalty. DoE follows a structured process for calculating the amount for penalty.

Any organization which was penalized is eligible to appeal as per section 10 and Section 11 of Environmental Conservation Rules – 1997.

vii. Enterprises prefer to pollute and pay fines in comparison to implement best available technology (BAT)?

Answer: No organization prefers a pollute pay fine, rather they will always go for the best available technology to avoid the fine.

viii. Industrial effluent discharge, industrial waste management and disposal, industrial air emissions: control, monitoring, reporting, compliance with existent standards. How does this happens?

Answer: For the air and effluent emission, industries of Bangladesh have a good control monitoring and reporting system against existing standard. For effluent, most of the industries maintain an in-house record for the conventional parameters (pH, COD, TDS and TSS) and for the air emission the factories conduct air quality test with a third party in periodic interval stated in the environmental clarence.

For the solid waste like sludge or leftover fabrics, chemical contaminated rags, polythene, drum – most of the factories do not have any monitoring and reporting system.

13. What is civil society perception and awareness about industrial pollution? Do they have knowledge about the damage on the environment and on people's health?

Answer: The neighbouring population of a polluting industry or an industrial cluster often complaint to the mass media reporters on their suffering due to pollution.

On the other hand, various civil society organizations like BAPA (Bangladesh Environmental Movement), Bangladesh Environmental Lawyers Association, Bangladesh Environment and Development Society and similar other organizations are highly aware and vocal about the environmental degradation due to unregulated industrialization.

14. Case study: focused on environmental initiatives, solutions, interventions adopted / implemented by MSME and large enterprises in the RMG sector.

Answer: Processing operations in the textile industry consume a lot of water. the water required for textile processing varies from factory to factory, depending on the fabric they produce, the equipment they use, and the dyestuff they prefer. The longer the processing sequences, the more water they need. According to recent PaCT assessment reports, average water consumption in Bangladesh's Washing, Dyeing, and Finishing (WDF) factories is 100 to 150 liter/kg of fabric production.

To reduce water consumption in a WDF (Washing, Dyeing and Finishing) factory, a PaCT expert team identified several opportunities including reducing, reusing, and recycling water. For example, countercurrent flow in a continuous washing machine is a proven technology that significantly reduces water consumption in fabric washing. It allows clean water to enter at the final wash box and flow counter to the movement of the fabric along the wash boxes. Recovery and reuse of blanket cooling water in a sanforizer—a shrinking machine—is another option for water saving.

Countercurrent washing is the most popular and successful way to reuse wash water, saving both water and energy. A sanforizing machine is used to stretch cotton and mix cotton fabric before it is washed.

PaCT team recommended recovering the blanket cooling water and using it in any hot water application in the wet processing section. Another option was to reuse it after filtering and

cooling down with a small cooling tower and the right circulation pump. Following these recommendations, ETL (Evince Textile Limited) implemented the two water-saving options by rearranging the existing piping and water flow direction. This required an investment of $3,899 (BDT 328,697) along with training and awareness raising sessions on using countercurrent flow in continuous washing machine, which saves 169,920 m3 of water per year. In addition, an investment of $475 (BDT 40,000) in blanket cooling water recovery saves 56,640 m3 of water per year. These two water-saving options reduce ETP load by 226,560 m3/yr [19].

Social Issues

1. Are there social regulations?

Answer: There are labor laws in Bangladesh and a major part of this regulations are social regulation. Those regulations are "Bangladesh Labor Act – 2006", "Bangladesh Labor Rules – 2015", "National Occupational Health Safety Policy – 2013", "National Child Labor Elimination Policy 2010" and "National Labor Policy – 2012".

The Department of Inspection for Factories and Establishments (DIFE) and Department of Labor (DoL) under the Ministry of Labor and Employment are two departments to enforce the social regulations [1].

2. If positive, what about social regulations compliance and enforcement?

Answer: The state of social regulation compliance is good in Bangladesh, especially in the export-oriented industries and RMG. In RMG sector, buyers audit the factory on a regular basis to ensure that factory is complying recommended as well as local labor and social regulations. Moreover, many RMG factories are certified with BSCI and SEDEX, and are being audited by a third party in regular interval. One of the major requirements of these labor and social standards is to ensure compliance iwth the law of the land.

As discussed, earlier Department of Inspection for Factories and Establishments (DIFE) and Department of Labor (DOL) under the Ministry of Labor and Employment are two departments to enforce the social regulations. DIFE and DOL try to visit factories regularly to enforce the regulations, however both of the department has man power shortage.

3. What are the effects for enterprises in violating social regulations?

Answer: In case of violation of regulation DIFE and DOL file case as per section 313 of Bangladesh Labor Act – 2016, at Labor Court and the court gives the verdict.

On the other hand, if the organizations violate the regulation, they will not get the certification of compliance for the BSCI or SEDEX and during the audit of these standards the third-party auditor will raise major non-conformity.

4. Fair labour practices?

Answer: Brands are conscious to source their product from a compliant factory in terms of labor and social regulation. Because labor and social issue are very sensitive both in home and at the consumer end. Most of the factories follow fare labor practices in Bangladesh.

Labors are very much aware about their right and in case of violation they may directly complaint to the buyer(s) of that factory.

5. Health and safety issues?

Answer: Health and safety are an important part of the "Bangladesh Labor Act – 2006" and "Bangladesh Labor Rules – 2015". Apart from those regulation other standards which RMG factory has to follow e.g., ZDHC, BSCI or SEDEX also have Health and safety part [2].

Brands are very concern about the Health and Safety condition of the factories and conduct audit to assess the OHS situation of their supplier factories. Also, there are many projects frombetter work, RMG Sustainability Council (RSC) of BGMEA, GIZ and other international organization on health and safety.

6. Working conditions?

Answer: Working condition is also part of "Bangladesh Labor Act – 2006" and "Bangladesh Labor Rules – 2015". Both the government agencies (DIFE and DOL) and brands are very much keen to ensure decent working condition specially at the RMG sector [2].

Labors are also aware about the working condition. In case of any grievance workers first can complaint to the factory authority and then the brands or to the labor court.

7. Child labor?

Answer: Now, child labor is not an issue for the RMG sector and it can be said confidently that RMG sector is almost free of child labor. With the concerted effort of trade association (BGMEA, BKMEA, etc.), buyers, donors, the Government of Bangladesh and NGOs, child labor has been eradicated from the RMG sector of Bangladesh. Since 2000 child labor has been eradicated from the RMG sector of Bangladesh. May be there are some unintentional child labor recruitment, which are considerd as an incident, factory immediately conduct root cause analysis and take corrective actions [3].

8. Forced labour?

Answer: Bangladesh is a rectifier of the International Labor Organizations (ILO) Convention C019: "Forced Labor Convention". Both the Bangladesh Labor Act 2006 and Bangladesh Labor Rules 2015 have strict requirement to stop forced labor [3]. In RMG sector force labor is not an issue now a days.

9. International conventions, international standards compliance?

Answer: Bangladesh is either a signatory or rectifier of 35 ILO conventions and most of them are in force. The conventions which are not in force, will be in force very soon.

Many brands require RMG factories to follow some internationally recognized social and labor standards like SA 8000, BSCI, SEDEX etc.

10. What measures are taken by trade partners, international buyers/brands, international agencies to ensure social standards compliance? And in case of non-compliance?

Answer: Trade partners, international buyers/brands or international agencies conduct periodic audits by them self or by a third-party organization to be sure that their partner RMG factory is in compliance with their recommended international standard and with the local laws.

In case of noncompliance with the buyer's/lander's recommended international standard - like BSCI or SEDEX - the RMG factory will not be certified or will not get satisfactory grade during third party audit for the respective standard. If the factory is not able to obtain certificate or satisfactory grade for the recommended standards brands may reduce their order quantity or cancel the affiliation of that factory.

11. Case studies: focused on social initiatives/ projects implemented by MSME and large enterprises in the RMG sector

Answer: Dulal Brothers Limited (DBL) a renowned RMG group in Bangladesh has started a fair price shop named "Bandhan" as a part of its CSR activities. Usually the workers do their groceryfromthe neighboring shops. There are some problems with these small shops like many times they sale bad product, sale date extorted product, do not want to lend the workers etc. Workers also spend significant leisure time to purchase their grocery.

To overcome this problem DBL group started a fire price shop at their factory premises. At “Bandhan” a worker is able to purchase items through credit but without bearing any interest. Price of goods are also lower than the outside shop as DBL is not making any profit from it. The credit is adjusted from their salary every month. “Bandhan” was initially launched in DBL Group’s Jinnat Complex where Garments and Knitting operations are taking place. With its success, today five complexes now have their own Fair Price Shop. What started with transactions worth BDT 1,217,444 (US$ 15,583) in 2008 expanded in 2015 to transactions amounting to BDT 51,287,477 (US$ 656,471). [4].

Capacity Building

1. Bangladesh RMG technical education and training system?

Answer: Textile Education can be divided into three levels; (a) Entry level, (b) Mid-level & (c) High level Textile Education in Bangladesh. Entry level is for Textile Vocational Education, Mid-level is for Diploma in Textiles & High level includes B.Sc. as well as M.Sc. in Textiles [1].

For Entry level textile education, currently, there are a total of 41 textile vocational institutes throughout Bangladesh under the Department of Textiles, government of the People's Republic of Bangladesh. The department is planning to set up 12 more textile vocational institutes in the coming years [2].

There are about 20 public and 40 private institutions offering diploma in various discipline of textile engineering. Every year almost 5000 students are getting enrolled in those diploma institutions [1].

About 4 textile collages, several public universities and 27 private universities are offering textile related bachelor of science degree. Total intake capacity of these institutions is 5000 new student every tear [2].

Some institutions are offering non-formal education in the field of textile trade. Currently Asian Development Bank (ADB), Swiss Agency for Development and Cooperation (SDC) and government of Bangladesh funded Skills for Employment Investment Program (SEIP) is the largest provider of this kind education in textile sector [2].

2. Employer support towards employees capacity building? (integration between industry and education institutions (universities, institutes and other training institutions; investment in Technical Education and the effects on industrial productivity).

Answer: Unfortunately, industry and academia integration are very rare in Bangladesh. However, for textile sector industry academia interaction is a bit better than the other discipline. Bangladesh university of Textile (BUTEX) has several projects in association with foreign universities which are integrated with local industries. Employers are not keen about the capacity building of their employes at their own cost.

For 20 years there was only one institution (BUTEX) providing higher education in textile engineering, now there are about 50 public and private institutions has textile engineering department [3].

3. Women entrepreneurship support / initiatives?

Answer: Women entrepreneurship in RMG sector in Bangladesh is not common like in many other sectors. For many instances women entrepreneurs get loan with low interest rate. Many NGOs and organization line "Women Chamber of Commerce and Industries" assist women entrepreneurs to set up their business.

4. Investment in labor skills improvement (staff training, managers training)?

Answer: Factories are not very interested to invest in the skill upgradation program or training for their labor force. Most of the skill upgradation program are offered by government, international agencies or buyers and most of them are free of cost. The industries allow their workers or personnel to attend those training and allow them for on payment education leave.

Sometime factories also arrange in house training at their own cost but those are mostly productivity improvement training like 5S, TQM etc. Factories rarely arrange training for technical skill upgradation [4].

5. Investment in research and development (R&D)?

Answer: The overall situation of research and development of Bangladesh is not satisfactory. In general, invest in research and development from both public and private sector are not sufficient. Every textile mill has a Research and development department, but that one is for sample development.

6. Case study: focused on capacity building and women entrepreneurship initiatives/ projects implemented by MSME and large enterprises in the RMG sector.

Answer: Over half of the 4 million Bangladeshi RMG workers are women. However, the positions available to women remain mostly limited to the machine-operator level. Leading

factories are realizing that moving women into management roles is not only beneficial from an image perspective, but increasingly important from a business perspective [5].

DBL designed an in-house training program for its female workers to upgrade their skills and choose female supervisorfromthose skilled workers.

When interviewed, this is what Ms. Khadiza Begum had to say. A former Junior Sewing Operator, Khadiza is now one of the 22 Female Supervisors of DBL Group.

Khadiza joined DBL in March 2014 and she got promoted as Supervisor in February 2015 after the in-house Female Supervisor Leadership Program training completion. Her last earning as Junior Sewing Operator was BDT 8,144 including over time. On becoming supervisor her salary is BDT 12,000 which is an increase of 47.35%.

Sharing her experience as a Supervisor she said that she is enjoying her new role. She now has people working under her and this makes her feel well. On her achievement she said, “As a Female Supervisor I am able to address issues of female workers within the sewing lines, which previously were not attended by male supervisor. Female issues are best understood by a female.” She commented upon further career growth, “It is possible to become Production Floor In-Charge and move upward if the management is beside us.”

Public Governance:

1. Multiple regulatory agencies and institutions, probably with overlapping mandates, roles. How the inter-government agency coordination runs? Are there synergies between them? Is there institutional charts of agencies responsible for environmental pollution control and textile sector industry?

Answer: There are little or no coordination between agencies having roles in preventing industrial pollution. Department of Environment (DoE) is the main government body for monitoring and regulating industrial pollution.

Bangladesh Bank (Central Bank of Bangladesh) approve a soft loan for energy efficient or less polluting technologies and equipment, but they do not have the capacity to verify whether the equipment is less polluting [1]. A third-party organization, or expert from Bangladesh University of Engineering and Technology (BUET), Bangladesh University of Textile Engineering (BUTEX) or other engineering universities or organization verify whether the equipment is less polluting. However, the coordination among the agencies is poor for this verification.

2. Does government give any support to enterprises, particularly MSME to comply with environmental regulations / standards and/or implement environmental management initiatives /tools (technical, financial)?

Answer: Government generally provides financial support to the MSME or large RMG industries through soft loan. Bangladesh Bank has a loan scheme with relaxed condition and low interest rate to finance safety retrofit and environmental upgradation. This loan is sponsored by AFD. Bangladesh bank disburses this loan through the scheduled banks and some non-banking financial institutions.

Sometime government or other international agencies like world bank group or brands provide limited technical assistance in the form of training, regarding implementation of environmental management initiatives.

3. If government, due to external pressure strengths environmental regulations, what would be the effect on to enterprises, particularly MSME? What would be the effect on people jobs?

Answer: Strengthening the environmental legislation, specially when the economy and industry are adversely affected by COVID – 19 will have negative consequences on the business. Many MSMEs will not be able to invest to comply with the new regulations and will shut down. Closing down of the MSMEs will led massive job cuts.

4. Would the country lose competitive advantage in the global market due to merchandize price increase as a result of salaries increase or/and as a result of the adoption of more stringent pollution control measures?

Answer: For salary increase the country will not lose its competitive advantage, if the RMG industry upgrades its productivity. As per the Asian Productivity Organization (APO) per hour productivity in RMG sector is USD 3.4 which is the lowest among Myanmar, Vietnam, India, Philippines, Sri Lanka, Indonesia and China. Except Myanmar, salary of RMG workers are higher in other competitors [3]. So, the increased salary can be compensated with the increased productivity [2].

On the adoption of more stringent pollution control measures will hamper the MSME or large RMG industry if government does not provide subsidies for purchasing new technology for pollution prevention.

Infrastructure Conditions

1. Country information regarding and its effects on industrial productivity:

i. Electricity supply, power generation capacity (hydro, thermal and geothermal)

Answer: Bangladesh has 20,383 MW of installed capacity. Majority of the electricity came from gas fired (53%) power plants, furnace oil-based power plants produce 27%, Diesel based plants produce 6.3%, Coal based plants produce 5.6%, hydro power plant produce 1.6% of total generated power and 5.6% power is imported from neighboring countries [1].

95% of Bangladesh has electricity coverage [2]. Most of the RMG factories are connected to grid with Rural Electrification Board's (REB) transmission line. The quality of transmission is not very good. It suffers for issues like power outage, load shedding, voltage fluctuation etc. These issues of electricity supply led the RMG industries to install own captive power capacity.

ii. Information technology

Answer: Since 2010 government started to build IT and ICT infrastructures for both public and private sectors. All the government agencies have their own website and those are updated regularly. Most of the government information are available through website. Application for electricity connection, gas connection, environmental clearance, company formation etc. are digitized.

iii. Logistics system

Answer: Logistic system is quite in good condition in Bangladesh. There are efficient and reliable logistics companies providing logistics support to the export-oriented industry.

iv. Communication system

Answer: All the RMG factories are connected to the internet through fiber optic or wireless connection. Internet connection in Bangladesh is affordable and uninterrupted. 165 out of 200 million people are connected to the mobile network in Bangladesh [3].

v. Transportation system (road, rail, air, pipeline and maritime transport infrastructure)

Answer: Most of the roads and highways are free of congestion, security in the highway is adequate, sea ports are in good condition. Moreover, Bangladesh is going to start a new deep-sea port at Matarbari, Chittagong and it already has two sea ports (Chittagong and Mongla). Bangladesh has total 22,419 km of road and national highways [4].

Bangladesh has total 4341 km of railway line with 103 train station access Bangladesh. 44 out of 65 districts are connected with railway network [5].

Bangladesh has 8 operational domestic airports among then 3 are international (Hazrat Shahjalal, Shah Amanat and Osmani International Airport at Dhaka, Chittagong and Sylhet respectively). [6].

Bangladesh has 1048 km of high-pressure gas transmission line [7].

vi. Water quality / availability

Answer: Ground water is abundant in Bangladesh, till now. Groundwater withdrawal from the shallow alluvial aquifer (depth <150 m) is the country's source of the waters [8]. The industries, specially the textile dyeing industries use huge amount of water and are depleting the ground water rapidly. All over Bangladesh the water quality is good with little contamination with iron, arsenic and manganese. In the coastal area salinity is a problem in the ground water.

vii. Sanitation

Answer: Though Bangladesh has for many years enjoyed almost universal access to drinking water, arsenic contamination of 22 percent of the country's tube wells lowered the service coverage to below 80 percent.

Bangladesh has made significant progress in reducing open defecation, from 34 percent in 1990 to just one percent of the national population in 2015.However, the current rate of improved sanitation is 61 percent, growing at only 1.1 percent annually [8].

Specific Questions

0. MSME and large enterprises definition in Bangladesh

Answer: According to the National Industrial Policy 2016 of Bangladesh, the MSMEs are defined as follows: the Micro Industry will include enterprises with either the value of fixed assets, excluding land and building, of less than Tk one million, or with less than 15 workers. The 'Small Industry' will correspond to enterprises with either the value of fixed assets between Tk. one million and Tk. 20 million, or with 16-50 workers. The 'Medium Industry' will correspond to enterprises with either the value of fixed assets between Tk 20 million and Tk 300 million, or with 51-120 workers [1].

1. How many RMG factories are there in Bangladesh? Among those, how many are micro, small, medium and large enterprises? How many are direct exporters?

Answer: In the year 2018 Bangladesh had 6821 RMG and textile factories [2]. Average number of workers per RMG factory is 949.

Data is not available on how many are Micro, Small, Medium and large enterprises.

2. How many workers are directly and indirectly employed by the RMG sector?

Answer: 4 million are directly employed and 10 million are indirectly employed in RMG sector [3].

3. The Bangladesh Economic Zone Act and Hi-Tech Park Act of 2010 led to the creation of two semi-autonomous agencies–Bangladesh Economic Zone Authority (BEZA) and the Bangladesh Hi-Tech Park Authority (BHTPA). How do they differ? How this zones operate, how are they succeeding in attracting investments, in improving exports, generating employment?

Answer: Bangladesh Economic Zone Authority (BEZA) is responsible for establishing Economic Zones (EZ) in Bangladesh. On the other hand, Bangladesh Hi-Tech Park Authority (BHTPA) is responsible to establish high tech parks and its mission is to establish IT/ITES based Industrial ecosystem and ensure all services for IT/ITES business & industries through One Stop Platform [4].

The major difference is, BEZA promote manufacturing-based industries and BHTPA IT/ITEs based industries. BEZA's objective is "BEZA wants to establish 100 Economic Zones on 30000 hectares of land in the next 15 years with an employment generation for 10 million people".

BEZA will promote ease of doing business and will provide one stop service– from land leasing to environmental clearance – to the investors. BEZA would provide multiple incentives, to the developers of the Economic Zones as well as to the investors. Benefits are range from income tax exemption to reduction in registration fees. The incentive structure for investment such as exemption of Taxes, custom/excise duties to non-fiscal incentives such as no FDI ceiling, issuance of work permits and recommendation for resident ship /Citizenship [5].

4. Bangladesh has 88 Special Economic Zones (SEZs), 59 government-owned and 29 privately owned. What are their role in boosting the economy toward an export-led growth?

Answer: As BEZA is providing good incentives and one stop service to the foreign investors to attract investment. A total USD 25,331 million investment were proposed till date in the established economic zones [6].

5. The Government of Bangladesh has decided to establish 100 SEZs until 2025, some in lagging regions around the country (Razzaque et al. 2018). What will be the effects on bridging regional disparities? On employment generation? Infrastructure availability? Are the potential environmental impacts being considered? Or will those regions become a second Greater Dhaka?

Answer: Definitely the Economic Zones (EZ) will have positive impacts on to decrease regional disparities. When the EZ will be established in the agrarian regions of the country, it will provide significant number of decent and formal jobs in that particular area. Before establishing economic zone, the zone owner has to conduct Environmental Impact Assessment (EIA) and get it approved by DoE. Moreover, environmental monitoring or enforcement in industrial cluster is easier and more efficient. Government is establishing EZs to promote controlled industrialization in the country.

6. Government to Government Economic Zones (G2G) are being established upon initiative of the government of a foreign country and the Government of Bangladesh: Chinese Economic and Industrial Zone, Japan, India. Can you elaborate about this "partnership"?

Answer: For example, if we see the Uttara Export Processing Zone (EPZ) at the north of Bangladesh, majority investment in this EPZ is from China and the Chinese companies want to be in close proximity. Benefits from this kind of cluster include increased berganing power to the authority, help employees to socialize in a foreign environment, there is a cultural harmony between industries and many more.

7. Public EZ, Private EZ, Public Private Partnership EZ, G2G EZ: their role towards sustainability?

Answer: All type of EPZs are strictly regulated for pollution control. EZs are obliged not to pollute the environment and take appropriate action to manage its waste. In the cluster of industries pollution prevention could be central which can save cost and increase effectiveness.

8. What are the positive and the negative environmental and social impacts of trade liberalization / trade agreements in Bangladesh?

Answer: As part of its growth strategy, Bangladesh instituted a trade liberalization process in the early 1990s which gained momentum in later years. Trade grew from 24.4 to 45% of GDP between 1980–81 and 2007–08, an indicator of increased liberalization as well as the growing importance of the external sector in Bangladesh [7].

As per the ILO report “Employment Effects of FTA Agreement” predicted that employment opportunity of skilled and unskilled manpower of Bangladesh will increase with FTAs. Bilateral trade agreements will always increase the market access to those countries. Empirical evidence has shown diverse results of the impacts or welfare gains of Bangladesh is involvement in different trading arrangements [8].

9. "Bangladesh is facing crucial choices regarding industrialization and environmental protection; a choice that necessitates the adaptation of preventive measures of industrial pollution" (Houque & Clarke, 2013). Could you elaborate about this sentence?

Answer: Bangladesh is industrializing rapidly and the industrialization is not very controlled. Industries are growing up haphazardly without following appropriate permissions and without having appropriate facilities to handle waste in that particular area.

Definitely the choice for Bangladesh is to become an industrialized country. But it also need to take immediate action to prevent the pollution for the growing number of industries. With the EZs, Bangladesh is taking holistic - awareness, financial and legislative - measures to prevent, control and manage environmental pollution from the industries.

10. What's the role of the Textile Technology Business Centre (TTBC) towards cleaner production and Occupational Health and Safety?

Answer: TTBC is knowledge hub for energy efficient technologies for textile industry, which is located at BGMEA premises and run by PaCT Bangladesh program. It provides advocacy services to the textile industry on energy efficiency measure, financing option for energy efficiency, provides training water efficiency, energy efficiency and effluent treatment. It also provides a B2B platform with reliable domestic and foreign supplier for energy efficient technologies and equipment.

11. The Bangladesh Garment Manufacturers and Exporters Association (BGMEA), published last year (2020) its Sustainability Report. What about the RMG enterprises? How many and/or which ones have published the report?

Sustainability Reporting is not very popular among the RMG industry of Bangladesh. As per the GRI database [13], till now only 4 factories have published their sustainability reports, among them only one has regularly publishd their sustainability report. With the PSES program of GIZ, they are supporting 6 RMG and Leather Factories and 5 appeal related Trade Associations to prepare their sustainability reports. However, the sustainability reports prepared with the assistance of this project has not published yet in GRI database.

12. Industrial activity is concentrated around greater Dhaka and Chittagong. Many RMG are located those cities, some of them in clusters or EPZ. Being located in a cluster or EPZ makes a difference regarding enterprises environmental performance improvement and/or adoption of environmental management tools?

Answer: Environmental performance of the industrial clusters like EPZ is always efficient than the concentrated industrial areas. Many of the EPZs have their central ETP and all have robust environmental monitoring from BEPZA (Bangladesh Export Processing Zone Authority). BEPZA also supports their factories with training and technical assistance for preventing environmental pollution. Most of the EPZs have their own laboratory to test the effluent sample from factories.

13. What are Bangladesh Textile Mills Association (BTMA), the Bangladesh Garment Manufacturers and Exporters Association (BGMEA) and the Bangladesh Knitwear Manufacturers & Exporters Association (BKMEA) role? What are there role in promoting / in pressuring MSME and large enterprises to adopt a sustainable manufacturing?

Answer: BTMA: Bangladesh Textile Mills Association or BTMA is the national trade body for textile mills, manufacturers, and mills in Bangladesh and is located in Dhaka, Bangladesh. It is the national trade body representing the country's yarn, yarn manufacturers and textile product processor mills under the private sector.

For promoting sustainable manufacturing BTMA had some projects with the donor organization. Generally, BTMA's activities in promoting sustainable manufacturing are not significant.

BGMEA: The Bangladesh Garment Manufacturers and Exporters Association (BGMEA) is one of the largest trade associations in the country representing the readymade garment industry, particularly the woven garments, knitwear and sweater sub-sectors with equal importance [9].

BGMEA is very much in line with the climate change mitigation and environmental pollution control activities. BGMEA recognizes that, environmentally sustainable production will attract more buyers in RMG sector and will contribute to the growth of export.

BGMEA has several projects for promoting sustainable manufacturing and pollution control measures. Usually BGMEA participates with government, NGO, international organizations and brands for such kind of project. Some of the projects BGMEA had actively participated

are PaCT, Green Factory, Green Button, Green Climate Fund, Technology upgradation fund etc [10].

BKMEA: Bangladesh Knitwear Manufacturers & Exporters Association, BKMEA; the Apex Trade Body to represent solely the Knitwear Sector of Bangladesh stands out in the global panorama with distinct identity and stature. BKMEA adheres to innovation and creativity so that the sector-based policy-making process becomes realistically and strategically perfect and gives off the result that expedites its developmental phase [11].

BKMEA has established a separate department named "Green Industry Development Cell" to promote sustainable manufacturing and environmental pollution control measures. BKMEA also provides consultancy to its member factories on LEED green building certification, productivity improvement, energy efficiency and water & waste management.

14. Does Bangladesh adopt any market-based solutions (pollution charges, tradable permits, carbon pricing).

Answer: Bangladesh Has not adopted any kind of market-based solution for GHG emissions trading.

15. Dhaka Stock Exchange and Chittagong Stock Exchange (CSE): listed companies x corporate social responsibility x sustainability. Is there any commitment by listed companies to promote / to improve environmental and social performance? To disclosure environmental and social performance?

Answer: In Bangladesh disclosure practices are mostly guided by the Companies Act 1994 (Government of Bangladesh, 1994), Securities and Exchange Rules 1987 (Government of Bangladesh, 1987), and the Accounting Standards adopted by the Institute of Chartered Accountants of Bangladesh (ICAB). Disclosure practices are also affected by a number of other statutes e.g. Bangladesh Industrial Enterprises Nationalization Order 1972, Banking Companies Act 1991 (Government of Bangladesh, 1991), Insurance Act 1938 (Government of Bangladesh, 1938), Income Tax Ordinance 1984 (Government of Bangladesh, 1984), etc [12].

Only 1.3% annual reports of the listed companies disclose its environmental information in the report [10].

16. The achievements / contribution of National Industrial Policy (NIP, 2016) in building a self-sustaining export-oriented industrial sector? Policy provisions toward a sustainable manufacturing?

Answer: Chapter – 16 of National Industrial Policy – 2016 provide guidance about environmentally friendly industrial management. This policy – 2016 emphasized on green productivity and the use of green technology thereby to protect environment, setting up of ETP, CETP would be encouraged by the government. To contain the Greenhouse Effect, the policy advocates for setting up Clean Development Mechanism or CDM in the industries. In this case, the use of 3Rs (Reduce, Reuse, Recycle) strategy is also encouraged in this policy.

General Questions

1. Industrial Symbiosis (IS) opportunities at cluster level?

Answer: Bangladesh has good opportunity for industrial symbiosis at cluster level as any Economic Zone will be established within next 5 years. BEZA already allocated 500 acres of land at Mirsarai economic zone in Chittagong for developing a garment park. Backward and forward linkage industries related to RMG can cluster in some economic zones for having efficient industrial symbiosis.

2. Eco Industrial Parks (EIP) development? Transformation of operating industrial states in EIP?

Answer: The demand of eco industrial park is increasing rapidly worldwide. It is also a scheme to attract FDI in Bangladesh. Till now Bangladesh did not establish or transform its existing industrial cluster like EPZs in to echo industrial park.

A recent World Bank project in Bangladesh aimed to develop a roadmap for low carbon growth and design an optimal policy framework to facilitate it for Chittagong Export Processing Zone (CEPZ) [1]. A yearly 244 tCO2 in GHG reduction and 331 megawatt-equivalent energy consumption avoidance are expected as an outcome of this project.

3 Industrial symbiosis opportunities at Eco Industrial Parks? Pilot EIP and/or industrial symbiosis program/ project being developed?

Answer: No such kind of project has been developed yet. But BEPZA is taking initiatives to make the EPZS more environmentally friendly.

4. Circular economy promotion at clusters, economic zones and/or at eco industrial parks?

Answer: No such kind of promotion is there.

5. Consolidation and establishment of special economic zones, and development of industrial clusters?

Answer: The industrial development is haphazard in Bangladesh and previously government had no control on where an industry should be developed. This uncontrolled industrialization created problems like waste management, effluent treatment, service deliver etc.

To overcome this problem government is now establishing Economic Zones to establish industries in a cluster for better land, environmental and service management.

6. Political instability and insecurity: is there a predictable and stable policy environment for industrial development?

Answer: Since 2010 Bangladesh is highly stable interior of political disturbance. Political stability is one the key issues for business and government in Bangladesh. Moreover, stability of a democratic government largely depends on the economic development. For this reason, it is predictable that, there will be stable political environment for the industrial development in Bangladesh.

Reference

Environmental Considerations:

1. Hossain R., (2017). BGMEA offers new platform 'Shonman' to replace ACCORD & ALLIANCE, pressure from international bodies continued. Textile Today, Bangladesh. August 22.

2. How can Micro, Small and Medium garment units survive during recent crisis? The Textile Today, 2019. https://www.textiletoday.com.bd/can-micro-small-medium-garment-units-survive-recent-crisis/

3. Rahman M. A & Hossain M S., (2010). Compliance Practices in Garment Industries in Dhaka City. Journal of Business and Technology (Dhaka), P 71-87.

4. Hossain, L., Sajib, M., & Hafiz, E. (2017). Readymade garment industries going green. The Financial Express. International Publications Limited. http://www The financial express-Bd. Com/2017/08/06/ 79126/Readymade-Garment-Industries Going-Green.

5. Alam, M. N. (2019). Bangladesh has 2nd most GOTs-certified factories. Textile today, Bangladesh. September 19.

6. Make better choices at every stage of a product's development http://apparelcoalition.org/Higg-product-tools/

7. Partnership for cleaner textile. In association with international finance corporation (IFC). http://www.textilePaCT.net/

8. Hasan, R. And Leonas, K. K. (2018). Collaborative approach for water & energy conversion: clothing industry of Bangladesh.

9. Khan, S R. (2019). The story of waste fabric (Jhoot): positioning Bangladesh. Textile today, Bangladesh. March 24. http://www.textiletoday.com.bd/the-story-of-waste-fabric-jhoot-positioning-Bangladesh/

10. USGBC projects certification. http://www.usgbc.org/projects?certification=%5b%22platinum%22%2c%22gold%22%2c%22silver%22%2c%22certified%22%5d&country=%5b%22Bangladesh%22%5d

11.https://www.bgmea.com.bd/page/Bangladesh_apparel_industry_moving_further_into_circular_economy_

12. The Green Button helps with purchasing sustainable textiles. GIZ (deutsche gesellschaft für internationale zusammenarbeit).

13. GRI, sustainability disclosure database. http://database.globalreporting.org/

14. BGMEA sustainability report 2020. http://download.BGMEA.com.bd/BGMEA%20 sustainability%20report%202020.pdf

15. Moazzem, K. G. And Radia, M. A. (2018). 'data universe' of Bangladesh's RMG enterprises: key features and limitations. CPD working paper 123. Dhaka: Centre for policy dialogue (CPD). http://cpd.org.bd/wp-content/uploads/2019/01/cpd-working-paper-123-data-universe%e2%80%99-of-Bangladesh%e2%80%99s-RMG-enterprises.pdf

16. Alam, Mahbubul Rashid, A.Z.M. Manzoor Furukawa, Yasushi (2008). Policy Implications and Implementation of Environmental ICTPs in Developing States: Examples from Bangladesh. Electronic Green Journal, 1(26). http://escholarship.org/uc/item/8mt001zf

17. BGMEA joins UN Climate Charter. The Bangladesh Garment Manufacturers and Exporters Association, 2020. http://www.bgmea.com.bd/index.php/page/BGMEA_joins_ UN_Climate_Charter.

18. Country Environmental Analysis Bangladesh. Asian Development Bank, July 2004.

http://www.adb.org/sites/default/files/institutional-document/32179/ban-cea-jul2004.pdf

19. Cleaner Production Case Study: Water Saving; Evince Textiles Limited. PaCT, Partnership for Cleaner Textile.

https://www.textilepact.net/wp-content/uploads/2021/03/case-study-water-saving.pdf

20. Kechichian. E., and Jeong. M. H., (2016). Mainstreaming Eco-Industrial Parks. https://openknowledge.worldbank.org/bitstream/handle/10986/24921/Mainstreaming0002 0150event0in0Seoul.pdf?sequence=5&isAllowed=y.

Social Issues:

1. Rahman T., (2019). Employee Rights & Labor Law in Bangladesh – All you need to know about Employment Law.

2. Islam. N., Afrin. S., Tasnim. T., Biswas M. P., Shahriar. T., (2018). Application of Labor Laws and Other Compliances in Readymade Garment Industry of Bangladesh.

3. BGMEA sustainability report 2020. http://download.BGMEA.com.bd/BGMEA%20sustainability%20report%202020.pdf

4. “Bandhan” Fair Price Shop. DBL Group. https://www.dbl-group.com/bandhan-fair-price-shop/

Capacity Building:

1. Siddique. M. A. R., (2017). Structure of Textile Education in Bangladesh. https://www.textiletoday.com.bd/structure-of-textile-education-in-bangladesh/

2. Textile schools in Bangladesh. Wikipedia, the free encyclopaedia. https://en.wikipedia.org/wiki/Textile_schools_in_Bangladesh#:~:text=Currently%2C%20ththe%20are%20a%20total,institutes%20in%20the%20coming%20years.

3. Bangladesh University of Textiles. Wikipedia, the free encyclopaedia. https://en.wikipedia.org/wiki/Bangladesh_University_of_Textiles

4. Background. SEIP, Skills for Employment Investment Program. https://seip-fd.gov.bd/about-us/background/

5. Female Supervisors in RMG; a case on DBL Group. http://www.dbl-group.com/wp-content/uploads/2019/03/Female-Supervisors-in-RMG-a-Case-on-DBL-Group.pdf

Public Governance:

1. Hasan. A. S. M. M., Rokonuzzaman. M., Tuhin. R. A., (2019). Drivers and Barriers to Industrial Energy Efficiency in Textile Industries of Bangladesh. Energies 2019, 12, 1775;

2. APO Productivity Databook, 2019. Asian Productivity Organization. https://www.apo-tokyo.org/publications/wp-content/uploads/sites/5/APO-Productivity-Databook-2019_light.pdf

3. Peata T. N., (2021). Garment Manufacturing Productivity & Bangladesh. https://textilefocus.com/garment-manufacturing-productivity-bangladesh/

Infrastructure Conditions:

1. Annual Report (2019-20). Bangladesh Power Development Board. https://www.bpdb.gov.bd/bpdb_new/resourcefile/annualreports/annualreport_1605772936_AnnualReport2019-20.pdf

2. Electricity sector in Bangladesh. Wikipedia, the free encyclopedia. https://en.wikipedia.org/wiki/Electricity_sector_in_Bangladesh#:~:text=Bangladesh's%20tot%20installed%20electricity%20generation,the%20commercial%20and%20agricultural%20sectors.

3. Number of mobile cellular subscriptions in Bangladesh from 2000 to 2019 (in millions). Statista. https://www.statista.com/statistics/497091/number-of-mobile-cellular-subscriptions-in-bangladesh/

4. Key Data. Roads and Highway Department. https://www.rhd.gov.bd/KeyData/KeyData.asp

5. Annual Report (2019-20). Ministry of Railway, Government of Bangladesh. https://mor.gov.bd/sites/default/files/files/mor.portal.gov.bd/annual_reports/76265db8_f240_466c_a127_7babe3433380/Annual%20Report%202020_Rail%20Ministry%20(2).pdf

6. Airports in Bangladesh. Civil Aviation Authority of Bangladesh. http://caab.portal.gov.bd/site/page/30210b33-66b8-4c1c-bc43-bff614005bbe

7. Sarwar. M. M., (2008). Presentation on Gas Infrastructure in Bangladesh. SARI / Energy ¬Global Energy Markets Trade Program Delhi, 27th February 2008. https://sari-energy.org/oldsite/PageFiles/What_We_Do/activities/GEMTP/Gas_Infrastructure_in_PETROBANGLA.pdf

8. Haque S.E. (2018) An Overview of Groundwater Quality in Bangladesh. In: Mukherjee A. (eds) Groundwater of South Asia. Springer Hydrogeology. Springer, Singapore. https://link.springer.com/chapter/10.1007/978-981-10-3889-1_13#:~:text=Groundwater%20is %20abundant%20in%20Bangladesh,(BGS%20and%20WaterAid%202001).

Specific Questions:

1. Abdin J. (2019). MSMEs - both a choice and a reality for Bangladesh. The Financial Express, August 2017. https://www.thefinancialexpress.com.bd/views/msmes-both-a-choice-and-a-reality-for-bangladesh-1566055028.

2. Moazzem, K. G. And Radia, M. A. (2018). 'data universe' of Bangladesh's RMG enterprises: key features and limitations. CPD working paper 123. Dhaka: Centre for policy dialogue (CPD). http://cpd.org.bd/wp-content/uploads/2019/01/cpd-working-paper-123-data-universe%e2%80%99-of-Bangladesh%e2%80%99s-RMG-enterprises.pdf

3. BGMEA sustainability report 2020. http://download.BGMEA.com.bd/BGMEA%20 sustainability%20report%202020.pdf

4. Vision & Mission. Bangladesh Hi-Tech Park Authority. http://www.bhtpa.gov. bd/site/page/9a0a5817-03e3-4ad2-a2b3-1bab300bbdc5/%E0%A6%AE%E0%A6%B F%E0%A6%B6%E0%A6%A8-%E0%A6%93-%E0%A6%AD%E0%A6%BF%E0%A6%B6 %E0%A6%A8

5. Bangladesh Economic Zones Authority (BEZA). https://www.beza.gov.bd/

6. Mala D. A., (2021). China top investor in Bangladesh's economic zones. https://thefinancialexpress.com.bd/economy/bangladesh/china-top-investor-in-bangladeshs-economic-zones-1610506680

7. Bangladesh Bureau of Statistics. http://www.bbs.gov.bd/

8. Raihan. S., (2017). Review of Bangladesh's Engagement in Preferential Trading Arrangements. Ninth Tranche of the Development Account Project Enhancing the Contribution of Preferential Trade Agreements to Inclusive and Equitable Trade. https://www.unescap.org/sites/default/files/DA9-01%20Bangladesh%20PTA%20review% 20-%20Raihan%20&%20Ashraf.pdf

9. Bangladesh Textile Mills Association. BTMA. https://www.btmadhaka.com/#

10. The Bangladesh Garment Manufacturers and Exporters Association. BGMEA at a glance. https://www.bgmea.com.bd/page/aboutus

11. Bangladesh Knitwear Manufacturers and Exporters Association (BKMEA). Green Industry Development (GID) Cell. https://bkmea.com/department/gid-cell/

12. Hasan. M. T., and Hosain. M. Z., (2015). Corporate Mandatory and Voluntary Disclosure Practices in Bangladesh: Evidence from listed companies of Dhaka Stock. Research Journal of Finance and Accounting, P14 – 32

General Questions:

1. Kechichian. E., and Jeong. M. H., (2016). Mainstreaming Eco-Industrial Parks. https://openknowledge.worldbank.org/bitstream/handle/10986/24921/Mainstreaming00020150event0in0Seoul.pdf?sequence=5&isAllowed=y