



Seminar Paper
On
Shifting Tannery Industries from Hazaribagh to Savar: Readiness
Measurement for Leather Working Group (LWG) Certification

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TABLE OF CONCENTS

	Page No.
Title page	i
Table of contents	ii
List of tables	iii
List of Annexures	iii
Acknowledgement.....	iv
List of Abbreviations	v
Abstract	Vi
 CHAPTER 1: INTRODUCTION	 1
1.1 Background.....	1
1.2 Problem statement	2
1.3 Rationale of the study	2
1.4 Objectives of the Study.....	2
1.5 Research Questions.....	3
1.6 Scope and limitations of the study.....	3
 CHAPTER 2: METHODOLOGY	 4
 CHAPTER 3: ANALYSIS, RESULTS AND DISCUSSIONS	 4
3.1 Reasons for shifting tanneries.....	4
3.2 Importance of LWG certification.....	5
3.3 Set criteria for LWG certification.....	6
3.4 Readiness of CETP of STIE.....	7
3.4.1 Construction work of CETP	8
3.4.2Waste management in STIE	8
3.4.3 Effluent treatment in STIE	9
 CHAPTER 4: CONCLUSION	 10
 References	 12
Annexure 1	14
Annexure 2	16

LIST OF TABLES

Table No.	Title of the table	Page no.
Table: 3.1	Chemical Analysis of Wastewater in Hazaribagh (DoE, 2008)	5
Table 3.3	Scoring system of LWG certification	6
Table 3.4.2	Findings of readiness in waste management	8
Table 3.4.3	Findings of progress in effluent treatment	9

LIST OF ANNEXURES

Annex. No	Title of Annexure	Page no
Annexure-I	Construction Progress of CETP and Dumping yard as on 30 November 2020	14
Annexure-II	Progress of Electro-Mechanical works of CETP and Dumping yard as on 30 November 2020	16

ACKNOWLEDGEMENT

I would like to express my heartfelt gratitude to Dr. Md. Mizanur Rahman, Module Director of Research for Governance and Policy Analysis of 130th ACAD course for his overall direction in conducting a study and writing a seminar paper. His inspiration helps me to conduct the study in a short period. He also taught us how to write a good report in short but smart and scientific way.

It's my pleasure to express my gratefulness to Dr. Md. Zohurul Islam, Director, BPATC and the mentor of my study. His encouragement, insightful comments and professional guidance gave me the courage and enhanced my skills in conducting the study and writing this seminar paper. It is an honour to work with such a strong academic mentor like him.

I am thankful to Engineer Jitendra Nath Paul, Project Director of Dhaka Tannery Estate (4th Revised) Project for spending his valuable time for interview and providing necessary documents and information. Thank also goes to other officials of the project for providing me in depth information regarding LWG certification.

I am pleased to thank Joint Secretary (Planning) of Ministry of Industries and Director (Engineering and Project Implementation) of Bangladesh Small and Cottage Industries Corporation (BSCIC) for their kind cooperation and giving information regarding this study.

Finally, I would pass my greatest appreciation to Course Management team (CMT) for excellent cooperation in conducting the study and the whole course in this pandemic Covid situation.

ABBREVIATIONS

ACAD	Advanced Course on Administration and Development
BELA	Bangladesh Environmental Lawyers Association
BPATC	Bangladesh Public Administration Training Center
BSCIC	Bangladesh Small and Cottage Industries Corporation
BOD	Biological Oxygen Demand
BTA	Bangladesh Tanners Association
CCRU	Common Crime Recovery Unit
CETP	Common/Central Effluent Treatment Plant
COD	Chemical Oxygen Demand
CPSIA	Consumer Product Safety Improvement Act
CSR	Corporate Social Responsibility
EMS	Environmental Management System
EPS	Effluent Pumping Station
ETP	Effluent Treatment Plant
FDI	Foreign Direct Investment
LDC	Least Developed Country
LFMFAB	Leather Goods and Footwear Manufacturers and Exporters Association of Bangladesh
METP	Municipal Effluent Treatment Plant
PD	Project Director
REACH	Registration, Evaluation, Authorization & restriction of Chemical
STIE	Savar Tannery Industrial Estate
USA	United States of America

ABSTRACT

Bangladesh leather industry has recently been facing a decline in export earnings gradually, due to a lack of environmental compliances. Tanneries of Bangladesh have been shifted from highly polluted Hazaribagh to Savar after a High Court order and a CETP is constructed there. To enhance leather exports, the industry must achieve certification from LWG, signifying compliance with environmental issues. The STIE is expecting LWG certificate which is essential for exporting leather and leather goods as well as attracting foreign buyers. There are 17 sections of auditing, of which 12 are critical. After compiling all marks, a company can achieve Gold, Silver, or Bronze medal based on the total marks obtained. The objective of the study was to measure the readiness of CETP of STIE for getting LWG certificate.

This study was conducted in a qualitative method by collecting primary and secondary data through Key Informant Interviews, physical inspection and reviewing concerned literature. Though there are 154 tanneries in the estate, the study was conducted on the readiness of CETP only, which is relevant for waste management and effluent treatment.

The waste management facilities in STIE are yet to complete. Solid waste is dumping in an open space as 2 dumping yards are under construction. Without completing the proper solid waste management system, getting of LWG certificate is a far cry. The CETP has the capacity to treat 25,000 liters of wastewater a day. In a standard way, processing of 1 mt of leather requires 25,000 to 30,000 liters of water. But in STIE it takes about 60,000 liters of water as the tannery owners are till getting water from the government free of cost. After Eid-ul-Azha, when about 50% of total animals are slaughtered in a year, the amount of effluent increased significantly.

Considering leather industry as a thrust sector, compliance of environmental issues and technical evaluation of CETP aligned with the LWG protocol must be confirmed to make it fully operational and internationally accredited. By achieving the LWG certificate, the branding of Bangladesh could be uplifted. Dumping of solid waste in the open field and excessive production of wastewater could not comply with environmental protocols to attain the worthwhile LWG certificate.

Image restoration is so badly needed for the leather sector. The Government must frame a master plan and develop a realistic and modern policy framework to rejuvenate the sector. Coordination among concerned Ministries/Divisions, Agencies, and different owners' associations is a must to achieve the goal. Production of high-quality leather goods could attract domestic investment and boost the capacity of private-sector manufacturers to provide the sector a much-needed stimulus.

CHAPTER 1

INTRODUCTION

1.1 Background

Bangladesh leather industry has recently been facing a decline in export earnings gradually. Tannery industry is treated as one of the main sectors which is responsible for industrial pollution globally. This industry converts a huge amount of freshwater into wastewater (Kabir et al. 2017). The tanning process produces large amount of solid waste and effluents. The effluents include chromium dyes, dissolved lime, acids, oils, organic matter, hydrogen sulfide, and suspended solids. These effluents are discharged as wastewater that has everlasting poisonous effects on humans and hampers the usual functioning of aquatic life (Cooman et al. 2003). In Hazaribagh, Dhaka 220 tanneries (95% of Bangladesh) were established. This area listed fifth among the top 10 polluted areas of the world (Bernhardt & Gysi 2013). There was no Effluent Treatment Plant (ETP) in this area; rather traditional methods like chemical precipitation, evaporation recovery, ion exchange, filtration, chemical oxidation, electrochemical treatment, reverse osmosis, or membrane technologies were used for removing trace elements from wastewater (Ahluwalia & Goyal 2007). Tannery workers in Hazaribagh experienced a lot of health problems including acid-burned, itchy, discolored, rash-covered skin, prematurely aged, peeling, dizziness, nausea, etc. (HRW 2012). Hazaribagh tanneries discharge about 22,000 cubic meters of untreated liquid waste per day into the river Buriganga wiping out aquatic life and nearby canals and ditches that also seep into groundwater (Daniel 2010).

Bangladesh Environmental Lawyers Association (BELA) filed a writ petition in High Court to relocate the tanneries from the densely populated area of Dhaka on an environmental argument. Accordingly, the High Court ordered to close all tanneries in Dhaka city immediately. The relocation was essential as the chemical and solid industrial waste adversely affected the air, soil, aquatic biodiversity, and ecology (Alam 2019). With the direction of the court, the tanneries have been shifted to Hemayetpur, Savar since 2017, and trying to comply with environmental laws and to create all facilities up to international standards. Subsequently, a Central Effluent Treatment Plant (CETP) is being constructed with modern technologies and equipment in Savar estate. To enhance leather exports to the United States and European countries, the industry must achieve certification from the Leather Working Group (LWG), signifying compliance with labor and environmental principles (Sadat et al. 2020). The LWG, established in 2004, is an international body of certification

of leather manufacturers in compliance with environmental standards. It develops and follows a procedure in assessing environmental requirements and performance capabilities (LWG 2020).

1.2 Problem statement

The tanneries of Bangladesh already shifted from Hazaribagh to Savar following the direction of the High Court. The Savar Tannery Industrial Estate (STIE) accommodates 155 tanneries on about 200 acres of land. The STIE is looking for an LWG certificate which is essential for exporting leather and leather goods as well as attracting foreign buyers. A huge construction works are going on in STIE including CETP construction, chromium recovery, and solid waste management under a project. The LWG team is supposed to visit the STIE to examine the compliances set on environmental, labor, and other issues very soon. There are 17 sections of auditing (with some 600 questions) of which 12 are critical. Every section has a minimum pass mark. After compiling all marks it can achieve a Gold, Silver, or Bronze medal or can be marked as 'audited' based on the total marks obtained (LWG Audit 2020). So, this study was conducted to measure the readiness of CETP of STIE to get the LWG certificate.

1.3 Rationale of the study

The STIE is a newly shifted estate from Hazaribagh. The Government is trying to regain the image of leather industries complying with international standards by getting an LWG certificate. The infrastructures along with CETP are being constructed under a project. The project is going to be ended on 31 December 2020. Though there are many studies and research conducted on leather industries of Bangladesh, no study so far conducted on the readiness of CETP in STIE. So, this study would help the Government, Bangladesh Tanners Association (BTA), Leather Goods and Footwear Manufacturers and Exporters Association of Bangladesh (LFMFAB) in policy interventions and to improve the industrial environment by further improvement and rectifying the loopholes. This study may also create a baseline and provide a clue for other academicians and researchers to conduct their research.

1.4 Objectives of the study

The fate of export earnings from leather and leather goods of Bangladesh would largely depend on the achievement of LWG certification of CETP for Savar Tannery Industrial Estate. The LWG audit

team would likely visit the estate very soon. If the estate could not able to comply with the fixed criteria of LWG, the leather sector of Bangladesh would be in huge trouble. The main objectives of the study were:

- (i) To examine the readiness of CETP of Savar Tannery Estate for LWG certification;
- (ii) To find out the prospects and challenges of Savar Tannery Estate;
- (iii) To recommend the way forward.

1.5 Research Question

The main question addressed in this study was:

Whether the CETP of Savar Tannery Industrial Estate (STIE) is ready to face the LWG audit to fulfill their protocols to get the LWG certificate?

1.6 Scope and Limitations of the Study

It was an opportunity to conduct this study before arrival of LWG audit team. This study could help the authorities to take into account the suggestions of this study and take necessary actions accordingly. It was also a scope to conduct the study easily as the study site was very near to Bangladesh Public Administration Training Center (BPATC). Though the study was very significant in the context of national perspective, there were some limitations for smoothly wrapping up the study which are stated below:

- (i) It's an important study that needed adequate time to conduct interviews and collect data. But Bangladesh Public Administration Training Center (BPATC) allocated only 3 days for this purpose which was not enough to interview a substantial number of stakeholders. Due to shortage of time only CETP of the estate was examined for compliance of LWG certificate. It was not possible to examine the individual tanneries situated in the estate;
- (ii) Due to Covid-19 pandemic circumstances it was not possible to collect all relevant data and was not possible to interview of all concerned stakeholders;
- (iii) To conduct a fruitful research, some financial and logistic supports, and research assistance are needed which were not provided by BPATC.

CHAPTER 2

METHODOLOGY

This study was conducted for the partial fulfillment of the training requirement of Advanced Course on Administration and Development (ACAD) conducted by BPATC. A qualitative method (collecting and analyzing non-numerical data) was applied to conduct the study. Both primary and secondary data were collected during the period of 1-3 December 2020. Primary data were collected from Savar Tannery Industry Estate, Bangladesh Small and Cottage Industries Corporation (BSCIC), and Ministry of Industries in Bangladesh through Key Informant Interviews, telephonic interviews, and by physical inspection of the estate. Secondary data were collected from journals, books, newsletters, websites, web portals and official archived documents. Though there are 154 tanneries in the estate, the study was conducted on the readiness of Common Effluent Treatment Plant (CETP) for waste management and effluent treatment. Before conducting the interviews, and physical observation, a checklist was prepared on which LWG would score on compliances for getting the LWG certificate. Descriptive analysis was done to find out the results.

CHAPTER 3

ANALYSIS, RESULTS AND DISCUSSIONS

3.1 Reasons for relocating tanneries

Hazaribagh, where most of the tannery industries of Bangladesh were established, lies to the west of Dhaka city that is a flood plain of the Buriganga, one of Dhaka's main rivers that lies just one kilometer away. It's an export oriented industry where around 80 percent of Bangladesh's total leather production is for export (UIL 2004). The effluent that produced from tanneries poured off floors and open gutters into Hazaribagh area contained animal flesh, dissolved hair, and fats. The effluent was mixture of lime, bleach, sulfuric acid, hydrogen sulfide, oils, chromium sulfate, formic acid, dyes, and numerous heavy metals used in the processing of hides and skins (Huq 1998). The tanneries produced a lot of solid and liquid waste. Processing of 1 metric ton of raw hide produces about 200 kg of leather product (with 3 kg of chromium), and 250 kg of solid waste, 200 kg of tanned waste (containing 3 kg of chromium), and 50,000 kg of wastewater (containing 5 kg of chromium) (Huffer and Taeger 2004). Each day, the tanneries in Hazaribagh created an estimated 75

metric tons of solid waste, an amount which increased to 200 metric tons per day in peak season (ACLIMA 2008). The lives of Hazaribagh people were greatly in trouble due to damage of the environmental balance (MoU 2003).

Table: 3.1 Chemical Analysis of Wastewater in Hazaribagh (DoE, 2008))

Parameter	Unit	Bangladeshi Standard for Tannery Industry Effluent	Hazaribagh (Sample 1)	Hazaribagh (Sample 1)
pH		6-9	5.017	4.987
Biochemical Oxygen Demand (BOD)	mg/L	100	846.7	730.00
Total Suspended Solids	mg/L	150	17467	15068
Chromium	mg/L	2	3324	2558

The above table shows that all parameters of water in Hazaribagh samples were extremely higher than permitted standards for tannery effluent. By analyzing the data and relevant documents, articles, and journals the following points are noted as the reasons for relocation of tanneries from Hazaribagh:

- (1) Enormous environmental degradation;
- (2) Serious health hazards of Hazaribagh population;
- (3) Severe water pollution of the historical and important river, the Buriganga;
- (4) Compliance of international organizations;
- (5) Severe destruction of bio-diversity of the area;
- (6) Pollution of underground drinking water with chromium;
- (7) Air pollution of foul-smelling with noxious gases; and
- (8) Workers' health and hazardous child labor.

3.2 Importance of LWG Certification

The Leather Working Group (LWG) is a multi-stakeholder body including representatives of tanneries, chemicals suppliers, machinery suppliers, traders, technical experts, retailers and brands. To verify the environmental aspects, the LWG has developed protocols for tanned leather production. The LWG works worldwide to evaluate companies and rating them with gold, silver or bronze medals as per audit report. An audited company is recognized as the environmentally

standard company. The certified companies have advantage to demonstrate environmental good quality practices to their stakeholders and their supply chain. This protocol shaped over the years and modified frequently to adjust the innovations. The protocol is similar to ISO but the difference is, LWG deals with environmental performance while ISO relates to system management not with environmental performance. In case of continual violation, LWG has the right to cancel the certification. Global importers of leather and leather goods are not placing work orders due to lack of environmental compliance in Bangladeshi tanneries. Consequently, export earnings from this sector which is the second major exports earner after garments; have seen a descending trend (Ovi 2018). Therefore, the LWG certification is very significant for Bangladesh. If we can achieve the certificate nobody will raise the question of the quality of our product. To compete with global market, we have to supply quality goods to retailers. And to do this LWG certification would be a branding.

3.3 Set Criteria for LWG Audit Team

The LWG certificate is given on the basis of scoring in different environmental fields. Of which some criteria are environmentally critical and some are non-critical. For getting a gold medal a company has to achieve overall 85% marks along with 85% marks in all individual critical sections. Similarly, 75% and 65% is required for getting silver and bronze metal, respectively. The detail of marks distribution is given below:

Table 3.3: Scoring system of LWG certification

Sl. No.	Criteria	Max. Score	Minimum requirement			
			Gold	Silver	Bronze	Audited
A	Critical Sections					
A1	General facility details	-	-	-	-	-
A2	Operating permits	100	85	75	65	0
A3	Tannery data	100	85	75	65	0
A4	Environmental management systems	100	85	75	65	0
A5	Restricted substances	100	85	75	65	0
A6	Energy consumption	100	85	75	65	0
A7	Water usage	100	85	75	65	0

Sl. No.	Criteria	Max. Score	Minimum requirement			
			Gold	Silver	Bronze	Audited
A8	Air & noise emission	100	85	75	65	0
A9	Waste management	100	85	75	65	0
A10	Effluent treatment	100	85	75	65	0
A11	Emergency plans	100	85	75	65	0
A12	House keeping	100	85	75	65	0
B	Non-critical Sections					
B1	Manufacturing processes	75				
B2	Beam house processes	60				
B3	Post tanning processes	50				
B4	Finishing processes	50				
B5	Complaints and public relations	20				
	Total	1355				
	Minimum Award Percentage		85%	75%	65%	50%

3.4 Readiness of CETP of STIE

The LWG certificate is needed for all individual 154 tanneries (so far established) separately as well as for Central Effluent Treatment Plant (CETP). The tannery owners are trying to comply with environmental issues for getting their own certificate and the government also monitoring and patronizing them in this regard. On the other hand, responsibility of getting the certificate for CETP goes completely on the government. Ministry of Industries and Bangladesh Small and Cottage Industries Corporation (BSCIC) are working very hard. A huge construction works including with CETP are going on under a project which is going to be ended in December 2020. Due to the shortage of time and some other limitations this study focused on the readiness of CETP only. This is to mention here that main environmental concern is about the compliance of CETP. The national and international organizations on environmental issues are concerned about the CETP. The area of auditing mentioned in Table 3.3, are not all relevant for the CETP. Only two sections (A9 Waste management and A10 Effluent treatment) are engaged for getting the LWG certificate for CETP.

3.4.1 Construction work of CETP

A project name Dhaka Tannery Estate Project has been running since 2021 with 4th time revision. A Chinese company is constructing physical works including CETP. After expiring the original time of construction, time of construction extended 11 times with the final time of 31 December 2020. The project office provided the item-wise progress reports of construction works (Annexure I) and progress of electromechanical works (Annexure II) as on 30 November 2020. The report shows that the physical works of STIE would be somehow completed by December 2020. But some soft issues like training of manpower, preparation of operating manual in Bangla, chrome recovery etc., are yet to complete. According to Project Director (PD), negligence of Chinese contractor and non-cooperation of tannery owners are delaying the completion of STIE.

3.4.2 Waste management

In manufacturing processes, all input materials don't fully converted into the final product. As a result, wastes are produced. The waste or byproduct sometimes can be reused or can be recycled into other products. If the waste can't be recycled waste materials should be disposed of in a safe and befitting manner, complying with regulatory system. One of the main reasons of relocating the Hazaribagh tannery was proper waste management. But the waste management in STIE is still not completed. Solid waste is dumping in an open place of 6 acres area. For solid waste management 2 dumping yards (20,00 sft and 12,000 sft) are being constructed.

Table 3.4.2 Findings of readiness in waste management

Sl.	Questions	Answers		
		Yes	No	N/A
(a)	Do you have the measuring system of all waste substances produced, e.g. fleshing, packaging, shaving materials, etc?	Yes		
(b)	Are there any mechanisms or system to control the waste or reduce the quantity of waste materials?	Yes		
(c)	Do you segregate of all hazardous and nonhazardous wastes and do you store them properly before disposing them?		No	
(d)	Do you dispose of all of the wastes in a proper and environmentally satisfactory method?		No	

The solid waste management is one of the crucial issues which is very harmful for environment and health, and creates nuisance and bad odor. Without completing the proper solid waste management system, getting of LWG certificate is far cry.

3.4.3 Effluent treatment

A leather processing industry uses a huge amount of water, and consequently generates large quantities of effluents. Improper treatment or management of effluent can cause a threat to the public health and environment. The pollutant features of effluent arise due to the release of undesirable materials during leather production. It is possible to treat the effluents within the tannery's individual Effluent Treatment Plant (ETP) or Municipal Effluent Treatment Plant (METP) or in a Common/Central Effluent Treatment plant (CETP). According to standard questions of LWG, some questions were asked about the effluent treatment of STIE. Results/answers of the questions are stated in following table.

Table 3.4.3: Findings of progress in effluent treatment

Sl.	Questions	Answers		
		Yes	No	N/A
(a)	Do you measure the quantity of effluent generated from the tannery operations?	Yes		
(b)	Do you conduct water balance (output volume Vs input volume) in your tannery to ensure all inputs are accounted for?	Yes		
(c)	Is the treated effluent tested to ensure it meets all regulatory requirements?	Yes		
(d)	Do you submit reports to the authorities demonstrating your compliance to regulatory requirements?		No	
(e)	Do you check the functioning of your effluent treatment system on a regular basis?	No		
(f)	If the treated effluent is used for irrigation, are the pollutant levels in the soil measured periodically?			N/A

During interview, PD said that the CETP has the capacity to treat 25,000 liters of wastewater a day. Leather processing is a water consuming industry. In a standard way, processing of 1 mt of leather requires 25,000 to 30,000 liters of water. But in STIE it takes about 60,000 liters of water which is almost double to standard level. After Eid-ul-Azha, when about 50% of total animals are slaughtered in a year, the amount of effluent increased significantly. At that time, existing capacity does not work. One of the reasons behind the excessive use of water is that, at present the tannery owners are getting water free of cost from the government. The government has imposed the price of water but the tanners are bargaining with the government to reduce the price of water. The government is also compromising with the tannery owners to make the STIE effective and to boost the leather industry by getting the LWG certificate.

CHAPTER 4

CONCLUSION

Export earnings from leather and leather goods are decreasing recent years (Apparel resources 2020). For a safe and compliant leather sector, the initiative was taken to establish the STIE. But due to unusual delay in completing the CETP, the sector could not become fully compliant. If Bangladesh wants to raise the leather industry as a major thrust sector in the future, and to increase its exports, the issues of inefficient supply chains needs to be addressed. At the same time, increase its quality and standards to provide higher value offerings to grip the global markets. Compliance of environmental issues and technical evaluation of CETP aligned with the LWG protocol must be confirmed to make it fully operational and internationally accredited. However, the leather industries and STIE have some prospects as well as some challenges also which are mentioned below:

Prospects of tannery industries

1. The Hazaribagh tannery has been shifted to Savar to make it an environment friendly one. Bangladesh has the duty-free access to China, if we can add value of more than 40 per cent in the products. We have adequate raw materials in leather goods that could make very easy to take the opportunity;
2. If we get the LWG certificate, nobody could raise questions about the quality of our products and we could compete with world competitors with higher price and international buyers and brands will put orders in our country;

3. Leather industry could be a thrust sector as Bangladesh meets the 10% of world leather demand;
4. Environment is a big issue, not only in case of leather sector but also in many other areas. By effecting the CETP in Savar, Bangladesh can stop the mouth of world environmentalist and simultaneously can reduce the health hazards;
5. By achieving the LWG certificate branding of Bangladesh could be uplifted.

Challenges in leather sector

1. Bangladesh is getting duty free access for leather and leather goods in two big markets, China and India, which will not continue after the LDC graduation. It would be a big challenge to compete with other countries in exporting leather goods;
2. The rich and politically powerful tannery owners don't like to follow the government orders/instructions; even they don't obey the court judgment. Non-cooperation of this stakeholder is also a big concern.
3. The CETP is not running at its fullest efficiency. Dumping of solid waste (about 70,000 tons a year) in open field and excessive production of effluent after Eid-ul-Azha can't comply environmental protocols to attain the worthwhile LWG certificate;
4. Relocating the tanneries to Savar will enhance the rate of environmental pollution in this area. Savar is experiencing tremendous pressure of new commercial, industrial, and residential institutions including garments and other industries. Unplanned industrialization could make Savar a new 'Hazaribagh'.

Recommendations

1. An image restoration is so badly needed for the leather sector through ensuring social and environmental compliance;
2. The leather sector, as the second largest foreign exchange earnings, needs urgent care to boost the economy and to do that the Government must frame a master plan, realistic and modern policy framework to rejuvenate the sector;
3. Coordination among concerned Ministries/Divisions, Agencies, and different owners' associations is a must to achieve the goal of LWG certification;

4. A mock test regarding compliance with environmental issues should be undertaken for the CETP as well as for all individual tannery before inviting the LWG;
5. Production of high-quality leather goods could attract domestic investment and boost the capacity of private sector manufacturers to provide the sector a much-needed stimulus;
6. As the graduation of Bangladesh from LDC is very near, FDI should be attracted in tannery sector as it would help to attract global renowned brands and share experiences;
7. As the sector is mostly related to private entrepreneurs, motivation of private sector to achieve the LWG certificate is necessary. Government should make them convinced to cooperate in this regard.

REFERENCES

ACLIMA (Asociacion Cluster de Industrias de Medio Ambiente de Euskadi) (2008), Application of Innovative Technologies for the Reclamation and Environmental Improvement of Derelict Urban Areas in Dhaka City (Bangladesh), Published in December 2008.

Ahluwalia SS and Goyal D (2007), Microbial and plant derived biomass for removal of heavy metals from wastewater. *Bioresour. Technol.*, 98(12): 2243-2257.

Alam MM (2019), Relocation of Tanneries Imperil Workers. *Dhaka Tribune*. Published on 21 July 2019.

Apparel Resources (2020), Experts suggest the way forward for the beleaguered leather sector. Published on October 9, 2020. (<https://bd.apparelresources.com/business-news/trade/experts-suggest-way-forward-beleaguered-leather-sector>)

Bernhardt A and Gysi N (2013), The world's worst: The top ten toxic threats; Clean up, progress and ongoing challenges. New York, Zurich:1-36.

Cooman K, Gajardo M, Nieto J, Bornhardt C and Vidal G (2003), Tannery wastewater characterization and toxicity effects on *Daphnia* Spp. *Environ. Toxicol.*, 18: 45-51.

Daniel L (2010), Colours of Water: Bangladesh's Leather Tanneries. Published on 12 May 2010.

DoE (Department of Environment) (2008), Survey and Mapping of Environmental Pollution From Industries In Greater Dhaka And Preparation Of Strategies For Its Mitigation.

Huffer S and Taeger T (2004), Sustainable leather manufacturing a topic with growing importance, Journal

Human Rights Watch (2012), Bangladesh: Tannery Harm Workers, Poison Communities. News Release of Human Rights Watch. Published on 8 October 2012.

Huq SMS (1998), Critical Environmental Issues Relating to Tanning Industries in Bangladesh, In Naidu et al. (eds), Towards Better Management of Soils Contaminated with Tannery Waste: proceedings of a Workshop held at the Tamil Nadu Agricultural University, Coimbatore, India, January 31 to February 4, 1998.

Kabir MM, Fakhruddin ANM, Chowdhury MAZ and Fardous Z (2017), Characterization of tannery effluents of Hazaribagh area, Dhaka, Bangladesh. Pollution 3(3): 395-406.

LWG (Leather Working Group) (2020), (<https://www.leatherworkinggroup.com/who-we-are>) (Accessed on 08 November 2020).

Leather Working Group Audit (2020), (<https://www.blcleathertech.com/what-we-do/consulting-auditing/leather-working-group-lwg-audits>) (Accessed on 14 November 2020).

MoU (Memorandum of Understanding) (2003). Memorandum of Understanding among Bangladesh Small and Cottage Industries (BSCIC), the Bangladesh Finished Leather, Leather Goods and Footwear Exporters Association, and Bangladesh Tanners Association. October 23, 2003.

Sadat M, Shibli S and Islam MT (2020), In Bangladesh, Tanners in Trouble. The Asia Foundation. Published on 27 May 2020 (<https://asiafoundation.org/2020/05/27/in-bangladesh-tanneries-in-trouble>).

UIL (Uniconsult International Limited) (2004). A Report on Census Study on Leather Sector in Bangladesh, Published on August 19, 2004, p. 51.

Ovi IH (2018).Tanneries relocation, non-compliance at Savar Leather Park weigh on export earnings. The DhakaTribune. Published on 26 December 2018.

Appendix-I**Construction Progress of CETP and Dumping yard as on 30 November 2020**

SL No	Name of Structure	Progress as on 30/11/2020	To be completed	Remarks
01.	Receiving Well & Distribution Box (Fine Screen and vortex chamber)	99.50%	Painting, Finishing	Finishing conditions
02.	Pre Aeration & Equalization Tank	99.50%	Painting & Finishing	Homogeneous Mixing
03.	A-Zone Oxidation Tank (South)	97.00%	SS rail, Blower room, Window, Painting	SS rail work is running
04.	A-Zone Oxidation Tank (North)	99.50%	Painting, Finishing	Finishing conditions
05.	B-Zone Oxidation Tank (South)	99.50%	Internal paint & other room	Finishing conditions
06.	B-Zone Oxidation Tank (North)	98.50%	Finishing, Blower room, Window	Finishing conditions
07.	Blower House & Dosing Room	99.50%	Finishing	Finishing conditions
08.	Power Distribution Room (MCC-2)	97.00%	Finishing	Finishing conditions
09.	Power Distribution Room (MCC-1)	99.00%	Finishing	Finishing conditions
10.	General Building (including testing laboratory)	99.00%	Electricity, Electrical work, finishing, control room	Finishing conditions
11.	Sludge Homogenization Tank (Thickening Tank)	99.00%	-	Finishing conditions

SL No	Name of Structure	Progress as on 30/11/2020	To be completed	Remarks
12.	Sludge De-Watering House	87.00%	Thai, window & finishing with repairing and painting	-
13.	Outlet Well (Disinfection Tank & Chlorine House)	99.00%	Finishing	-
14.	Roads and Drains i) Roads ii) Drains	30.00% 80.00%	Roads: Soling, Finishing and casting	i) Sub-base of roads work is nearly completed. ii) Drain almost completed
15.	Miscellaneous (Compound wall)	85.00%	CETP Main gate	-
16.	Treated Effluent Storage Tank (Magnetic Flow Meter Well)	98.00%	Finishing	-
17.	Sludge Reaction Tank (Sludge Drying Bed)	99.00%	Painting, Finishing	-
18.	Entrance Guard	93.00%	Water supply/ Electricity	-
19.	Effluent Pumping Station : EPS-1	95.00%	Boundary wall, Road, Toilet	Effluent Transfer to Equalization Tank
	EPS-2	98.00%	Toilet	Effluent Transfer to Equalization Tank
	EPS-3	93.00%	Boundary wall, Road, Toilet	Effluent Transfer to Equalization Tank
20.	Common Chrome Recovery Unit : CCRU-1	95.00%	-	Chrome separation is running
	CCRU-2	98.00%	-	Chrome separation is running
	CCRU-3	94.00%	-	Chrome separation is running
21.	Pipe line Construction :			
	Pipe line under EPS-1	99.50%	-	Complete
	Pipe line under EPS-2	99.50%	-	Complete
	Pipe line under EPS-3	99.50%	-	Complete

Appendix-II**Progress of Electro-Mechanical works of CETP and Dumping yard as on 30 November 2020**

SL No	Name of Structure	Progress as on 30/11/2020	Completed	Work to do	Remarks
01.	Receiving Well & Distribution Box (Fine Screen and Vortex Grit chamber)	98.00%	Permanent Electrical connection completed	-	Vortex grit chamber is in operation with gravity force. The pump attached. Not compatible with the system.
02.	Pre Aeration & Equalization Tank	92.00%	Permanent Electrical connection completed	-	Homogeneous Mixing in operation
03.	A-Zone Oxidation Tank (South) (A3+A4)	94.00%	Electrical connection	-	Trial running
04.	A-Zone Oxidation Tank (North) (A1+A2)	95.00%	Mechanical equipment installed & electrical connection completed	-	Trial running
05.	B-Zone Oxidation Tank (South) (B3+B4)	95.00%	Mechanical equipment installed Electrical connection	-	Trial running
06.	B-Zone Oxidation Tank (North) (B1+B2)	96.00%	Mechanical equipment installed & electrical connection completed	-	Treatment trial running

07.	Blower House & Dosing Room	98.00%	Mechanical almost completed & Electrical connection	-	Blower is running, Chemical dosing not continuing
08.	Power Distribution Room (MCC-2)	97.00%	Permanent Electrical connection, Mechanical equipment installed	Controlling & automation	2 nos. generator not in operation. Repairing and test run is going on.
09.	Power Distribution Room (MCC-1)	98.00%	Mechanical equipment installed	Controlling & automation	2 nos. generator not in operation
10.	General Building	80.00%	Electrical fittings & fixtures partly installed	Controlling & monitoring, AC, Fan, Electrical connection	Control room not in operation, Testing lab. partly operational
11.	Sludge Homogenization Tank (Thickening Tank)	95.00%	Mechanical equipment & Electrical connection	-	Sludge is receiving/ trial running
12.	Sludge De-Watering House	84.00%	-	Electrical cable trench & cable laying, PMCC cabinet	9 nos. cabinets for filter press arrived at CETP but 3 nos. installed without controller.
13.	Outlet Well (Disinfection Tank & Chlorine House)	98.00%	Permanent electrical cable tray	-	Chlorine dosing not started
14.	Treated Effluent Storage Tank (Magnetic Flow Meter Well)	98.00%	Permanent electrical cable tray	-	Operational
15.	Sludge Reaction Tank (Sludge Drying Bed)	90.00%	Mechanical equipment installed	-	Not in operation due to non-operation of filter press,

16.	Entrance Guard	93.00%	-	Electrical connection water tank etc.	
17.	Effluent Pumping Station : EPS-1, EPS-2, EPS-3	98.00%	Mechanical equipment installed & Electrical connection	-	Effluent Transferring to Equalization Tank
18.	Common Chrome Recovery Unit : CCRU-1, CCRU-2, CCRU-3	95.00%	Mechanical equipment installed & Electrical connection	Chrome Recovery and reuse to be started. Repair and maintenance needed.	Chrome separation is running (partial)
19.	Pipe line Construction :				
	i) Pipe line works EPS-1, EPS-2, EPS-3	99.50%	Pipe installed	-	Completed
	ii) Effluent Gravity Conveying pipes laying	100%	Pipe installed	Remaining partial portion	Nearly Complete
	iii) Chrome Effluent Gravity Conveying pipes laying	100%	Pipe installed	-	Complete
	iv) Pipe laying works for Effluent pumping mains from EPS to CETP site	100%	Pipe installed	-	Completed
	v) Process pipe	99%	-	-	Completed
	vi) Sludge pipe	99%	-	-	Completed
	vii) Dosing pipe (SS)	99%	-	-	Completed