

Legal Issues of River Pollution through Industrial Effluents

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Abstract

Rivers are said to be one of the most precious natural resources of Bangladesh and contribute a lot to her agro-based economy. Besides, rivers of Bangladesh are the constant source of protein. Importance of rivers in the economy of Bangladesh is immense. The Government of Bangladesh has adopted a good number of policies following the laws passed by the Parliament in the relevant field. Still the rivers are getting contaminated day by day through industrial effluents indiscriminately. Industrial units across the country discharge their effluents to the rivers directly and indirectly. This harms the riverine environment. The objective of this research is to examine the related laws and tender recommendations to that effect.

1. Introduction

Bangladesh is crisscrossed by hundreds of rivers. Rivers, water, wetlands and floods are the lifeblood of Bangladesh (Er Rashid, 2002). Most of Bangladesh has developed as a result of the continuous sedimentation of the flow of three main river systems called the Ganges-Brahmaputra-Meghna river systems. It is said that the lives and livelihood of Bangladesh are intertwined with its rivers and innumerable other water bodies which have contributed to the development of civilization and culture of this country in many ways. The considerable and significant contribution that rivers of Bangladesh provide in the fulfilment of protein intake (third largest in the world after China and India) covers almost 60% of the total intake of the rural areas. According to the report released by the Water Development Board of Bangladesh, almost 310 rivers flow through Bangladesh and out of them 54 is shared with India and 3 with Myanmar. Rivers are the constant sources of irrigation, land, transportation, sand, fish on and so to the people of Bangladesh since time immemorial; but human intervention has damaged and destroyed this blessed character of the rivers of Bangladesh. Different types of human activities have been polluting the rivers an alarming rate. The riverine environment of Bangladesh is deteriorating through pollution in a number of ways and pollution through industrial effluents is a major contributor in this respect. Indiscriminate dumping of industrial and sewage wastes and increased encroachments are damaging the riverine environment of Bangladesh. Many initiatives, both at the governmental and non-governmental levels, have already been taken to ensure the normal flow of the rivers protecting them from encroachments and industrial effluents. Among those initiatives are the legal and regulatory framework adopted by the Government with a view to protecting the rivers from industrial effluents. The objectives of this research are to examine the suitability of these legal and regulatory frameworks and tender recommendations to that effect.

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2. Industrialization vis-à-vis pollution of riverine environment in Bangladesh

Pollution means such contamination, other alteration of the physical or biological properties of air, water or soil, including change in temperature, taste, turbidity or odour or any other characteristics of these or such discharge of any liquid, gaseous, solid, radioactive or other substances into air, water or soil or any elements of the environment as will or is likely to create nuisance or render such air, water or soil harmful, injurious, detrimental or disagreeable to public health, safety or welfare or to domestic, commercial, industrial, agricultural, recreation or other benefits, uses or to ecosystems including livestock, wild animals, birds, fish, plants or other forms of life. Environmental pollutants means any solid, liquid or gaseous substance present in such concentration as may be or tend to be injurious to environment and also includes heat, noise and ray. Industrial effluents means materials generally discarded from industrial operations or derived from manufacturing processes. It is also used to mean the liquid waste produced by industrial processes. Industrial effluents carry a broad and variable range of contaminants, including BOD, COD, colour, phenols, cyanides, sanitary waste and a host of complex chemicals. Bangladesh is experiencing rapid industrial growth and this is making environmental conservation a difficult task (WB, 2007). The industrialization process of Bangladesh is going on at a medium pace though not in a speedy way. The process of industrialization is, on the one hand, solving the unemployment problem, on the other hand, causing some irreparable loss to the riverine environment of Bangladesh. Almost all the industrial units, large or small, discharge liquid effluents to waterbodies which generally flow into the rivers and ultimately cause pollution of riverine environment. The industrial effluents that pollute riverine environment are very few in number and they are known as ammonia, chromium and other heavy metals from fertilizer factories, mercury from chloralkaline units, phenols from pulp and paper refineries, plastic, pharmaceutical and paint industries. Industrial emissions like acids, alkalis, suspended solids and other inorganic loads expressed in terms of BOD (Biochemical Oxygen Demand) and COD (Chemical Oxygen Demand) respectively also pollute riverine environment. Industries in Bangladesh have been established mainly on the bank of the rivers particularly in the Dhaka and Chittagong regions.

Region-wise number of Industrial Establishments and Polluting Industries are shown in the following table:

Region	No. of Establishments	Textiles, apparels & tanneries	Paper, paper products & printing	Chemicals, plastics & petroleum	Non-metallic minerals manufactures
North West	4,403	545	113	181	360
North Central	12,133	4,093	707	1242	733
North East	1,117	55	20	47	132
South East	2,518	346	68	83	549
South Central	1,408	128	29	77	157
South West	849	72	39	42	199
Total	24,934	5,714	1078	1903	2359

3. Impact of industrial effluents on riverine environment

Most possibly for ensuring speedy, expeditious and safe navigation facility the industrial units are located along the rivers of Bangladesh. This geographical location of the industrial units facilitates the discharge of industrial effluents directly into the river without conducting industrial impact assessment. Textiles, tanneries, pulp and paper mills, fertilizer, industrial chemical production and refineries are mostly located in the North Central region which release wastewater and other effluents containing high alkalinity, high biological oxygen demand (BOD) and high-suspended solids without proper treatment into the nearby rivers(Siddiqui, 2010). At present the riverine environment of the river Buriganga is so badly affected that all fish have died, and increasing filth and human waste have turned it into a black gel. Even rowing across the river is now difficult for it smells so badly. The river Buriganga that runs past the capital city of Dhaka, in fact, is being used as a dumping ground for all kinds of solid, liquid and chemical waste. The bankside pollution has narrowed the river, disrupted its normal flow and polluted it in a manner that exposes its aquatic life to extinction. The other rivers like Turag, Dhaleshwari, Balu and Narai flowing around the Dhaka city are in the same condition as that of the Buriganga. The rivers of Buriganga and Shitalakkhya have turned into this condition since 2001. They have lost their character as rivers and turned into large drains.



Picture1: How the river of Buriganga gets polluted through industrial effluents violating the laws.

The Shitalakhya river flows from the east of Dhaka. Besides the Ghorashal Urea Fertilizer Factory and an oil terminal situated on the bank of it, industrial units at Narayanganj and Demra are also sources of the pollution. Monitoring data of the DoE demonstrated that the concentration of dissolved oxygen in the river Shitalakhya beside the fertilizer factory varies between 2.1 to 2.9 mg/l during low tide (DOE, 1993). Monitoring data of the Surface Water Modelling Centre (SWMC) on the same river, showed a degrading trend for water quality in the dry season. Preliminary assessment of water and sediment pollution load along the coasts of Chittagong and Cox's Bazar showed that the dissolved concentrations of metallic and non-metallic elements in water are higher towards the sea and that of sediments are higher towards land due to land-based activities and untreated effluents from urban centers. The lead concentration has crossed the acceptable level (0.2 ppm) in most areas, except Bakkhali, lower Kumira, and upper and lower Karnaphuli. As many as 720 industrial units have been established along both its banks, and dirt and garbage of these factories are indiscriminately being dropped into the river. Consequently the river Karnaphuli is getting polluted more and more day by day putting different types of fish and other water-species of the region on the verge of extinction.



Picture2: How the river of Buriganga gets polluted through industrial effluents violating the laws.

Violating the Environment Conservation Rule 1997, more than 7,000 units of industries for textiles, metals, chemicals, rubber, pharmaceuticals, cement, leather, pulp, paperboards, fertilizer, food processing, and petroleum refining in the city area are discharging 1.3 million cubic metres of untreated industrial effluents in the rivers per day.



Picture 3: The contaminated condition of the river Buriganga.



Picture 4: A boy collects rubbish on the river Buriganga in Dhaka (May 17, 2010). It was once the lifeline of the Bangladeshi capital. But the once mighty Buriganga river, which flows by Dhaka, is now one of the most polluted rivers in Bangladesh because of rampant dumping of industrial and human waste. As the picture depicts, the boys and girls collecting rubbish from such areas put themselves in a serious health hazard. However there exists no mechanism that will prevent boys and girls from collecting such rubbish with a view to saving their health and ensuring their right to health as guaranteed in the Constitution of the Peoples' Republic of Bangladesh.



Picture 5: Severe pollution has reduced the river Buriganga to a 'dumping drain' of toxic refuse, threatening millions of people living on its banks with serious health hazards and loss of their livelihoods.



Picture 6: With new industries and an entire new city sprouting along its banks, the river Balu on the eastern fringe of the city is slowly dying, strangled by land encroachment and poisoned by industrial pollution, creating serious health hazard for several lakh people living in the area.

Tanneries established in the capital city of Dhaka cause serious environmental pollution through discharging their untreated effluents directly or indirectly into different water bodies leading to the river Buriganga. Workers of these tanneries are suffering from different chronic diseases resulting from the extremely polluted environment surrounding these tanneries industries. According to a report released by the Bangladesh Society for Environment and Human Development, around 8000-12000 workers at the tanneries suffer from gastrointestinal, dermatological and other diseases due to environmental pollution and 90% of them die before they reach the age of 50. Most of the tanneries are 30-35 years old and use mineral tanning processes that discharge about 6000 cubic metres of liquid effluent and 10 tonnes of solid waste every day, according to figures from the Bangladesh government and the Food and Agriculture Organization. There are about 200 tanneries that release almost 15,000 cubic meters of liquid wastes, 19,000 kilograms of solid wastes and 17,600 kilograms of Biological Oxygen Demand (BOD) load go into the Buriganga each day from these industries. A World Bank report claimed that Bangladesh receives 1.5 million cubic meters of waste water every day from 7,000 industrial units, and 0.5 million cubic meters a day from other sources. Putting controls on this waste may help combat the premature deaths that occur among Bangladeshi children because of pollution. A laboratory research was conducted to find out the impact of textile industrial effluents and its effect on the aquatic macrophytes and algae in the Kornapara area of Savar. The physicochemical parameters reveal that Total Suspended Solids (TSS) and Total Dissolved Solid (TDS) was found 100 to 336 mg/L and 1856 to 4356 mg/L, pH was 9.6 to 11.2 and temperature 40.5 to 43 OC, Dissolved Oxygen (DO), Biological Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) was recorded 0.11 to 0.5, 151.24 to 299.1 and 652.8 to 2304 mg/L, respectively; electrical conductivity (EC) was

monitored 2210 to 6020 $\mu\text{s/cm}$; salinity was found 1.1 to 3.3 ‰, and colour 1890.75 to 5625 PCU. Zinc (Zn), cadmium (Cd), copper (Cu) were 0.0838 to 0.596, 0.0 to 0.0006, 0.018 to 0.1727 ppm, respectively and all of the physicochemical parameters were found beyond the standard limit set by Department of Environment (DoE). A research conducted on the impact of the industrial effluents reveals the fact that it increases the temperature of the water that decreases the rate of germination. Industrial effluents contaminate the river water in such a way that people get affected with a number of diseases like diarrhoea, gastric ulcers, respiratory illnesses, hepatitis and anaemia by using such water for bathing and other domestic purposes. The mighty river Karnaphuli is losing its riverine environment day by day due to the continuous discharge of untreated industrial effluent into it. In a recent drive led by the DoE official it was found that due to the discharge of untreated effluents into it by the Super Knitting and Dyeing Mills located in the Bayezid Bostami area, the rate of liquefied oxygen was found only 3.2 percent which is harmful for the environment and biodiversity.

4. 1. Legal Framework to control emission of industrial effluents

Rivers, canals, lakes, beels, haors, wetlands and the like are considered to be the national property of Bangladesh and hence it is the constitutional duty of every citizen of Bangladesh to preserve and protect all of these natural resources cum national property of Bangladesh. The Government of Bangladesh has adopted a good number of laws to regulate, control, maintain, preserve and protect the natural resources including the rivers of Bangladesh. Among those laws the following can pertinently be mentioned:

- (i) The Inland Water Transport Authority Ordinance, 1958;
- (ii) The Bangladesh Water Development Board Act, 2000;
- (iii) The Water Resource Planning Act, 1992;
- (iv) The Indo-Bangladesh Joint Rivers Commission, 1972;
- (v) Ports Act, 1908 and the Rules of 1996;
- (vi) Bangladesh Environment Conservation Act, 1995 and the rules of 1997 thereunder;

However the Environment Conservation Act, 1995 as amended in 2010, till today is the only Act which has been passed for the sole purpose of preserving and protecting the environment of Bangladesh from pollution from different sources. Under this Act, the Government has been empowered to establish a Department of Environment for the purpose of carrying out the objectives set out in this Act. The head of the Department of Environment has been designated as Director General who has been empowered to take all such steps as may be deemed reasonable and necessary for the conservation, improvement of environmental standard and control and mitigation of pollution of environment. The functions of the Director General includes to advise for friendly handling, storage, transportation, import and export of hazardous substance or its components, research and inquire about the information regarding the conservation, improvement and pollution of environment and assist other authority or agency in the similar function, examine any place, premises, plants, equipment, manufacture or other processes, ingredients or substances for the purpose of improvement and control and mitigation of pollution. The DG has the power to collect, publicize and disseminate information regarding environment pollution and at the same time it may advise the Government to reject such manufacturing process, materials and substances as are likely to cause environmental pollution. He may issue direction for the closure, prohibition or

regulation of any industry, initiative or process. Following the advice of the DG the Government may issue a direction imposing absolute ban on the manufacture, import, marketing, sale, demonstration of sale, stock, distribution, commercial carriage or commercial use of any activity that pollute environment. The DG may also hold public hearing of any application made by any person affected from the pollution or degradation of environment and pass order accordingly. This Act imposes liability upon the person to intimate the DG of the excessive discharge of effluents and the DG shall forthwith take such remedial measures as are necessary to prevent or mitigate the environmental pollution and such person shall be bound to render all assistance to the DG as required by the DG. The DG preserves the power to enter any such building and inspect any activity for the purpose of examining or testing any equipment, industrial plant, record, register, document or any other material object. The DG may delegate power to collect samples of air, water, soil or other substance from any factory, premises or place in such manner as may be prescribed by rules. This Act makes it clear that no industrial unit or project shall be established or adopted without obtaining environmental clearance from the DG. Anyone who violates the provision of this Act is liable to be punished as per Section 15 of the Act. Almost all the industries established on the bank or beside the bank of the rivers fall under the red category as categorized under the Environmental Rules 1997 as per the authority of the Environment Conservation Act, 1995.

Besides, the National Water Policy, 1992 prescribes for the zoning regulations for the location of new industries in consideration of fresh and safe water availability and effluent discharge possibilities. It sets out provisions for monitoring of the effluent disposal by the relevant government agencies, standard for disposal of effluent into common watercourses. The National Environment Policy adopts directives for rectification of all industrial effluents, Environmental Impact Assessment Impact, banning of all polluting products and encouragement of innovative, environment friendly technology.

The Environment Conservation Act (ECA), 1995 (as amended up to 2010) empowers the Director General of the DoE with a good number of legal weaponry regarding controlling of emission of industrial effluents and monitoring of the same. However it does not prescribe any specific time limit as to at what regular interval the DG will examine the surrounding environment of the industries which are emitting industrial pollutants. The Environment Conservation Rules (ECR), 1997 is also silent about it. As per the provisions of Section 4(2) (f) of the Environment Conservation Act, 1995 the DG may collect, publish and disseminate information regarding environment pollution but it has not set any time limit regarding the time of collection, publication or dissemination of the report regarding environment pollution. The Environment Conservation Rules (ECR), 1997 provides for the installation of Effluent Treatment Plant (ETP) but it does not set any criteria regarding how long will it operate or it does not set any standard for recycling of the ETP. Besides, the said ECR does not prescribe any standard regarding the design of the ETP.

Neither the Act nor the Rules prescribe any specific area for the installation of the industries. Consequently, the entrepreneurs get location clearance from the DoE without assessing the environmental impact of the operation of such industries therein.

4.2. Institutional Framework

The Department of Environment ("DoE") headed by the Director General (DG) under the Ministry of Environment and Forest is the Regulatory Body responsible for enforcing the ECA and ECR. To prevent industrial pollution the DG can give order, direction or issue notifications, to the owner of an Industry for improvement of the surrounding environment by controlling and mitigating any pollution caused by the activity of the industry. It is discovered by a drive carried out by the Department of Environment officials that though some of the industries have Effluent Treatment Plant (ETP) but it does not work or are not kept in operation round the clock though there is a requirement that those should be kept in operation round the clock. However, this body is useless, with no strict approach from the Government. Besides the Department of Environment (DoE) there exists a good number of other government and autonomous bodies for the protection and preservation of the environment of Bangladesh. The Ministry of Water Resources, Water Resources Planning Organization (WARPO), Bangladesh Water Development Board (BWB), River Research Institute, the India-Bangladesh Joint Rivers Commission (JRC), Ministry of Environment and Forest (MoEF), Ministry of Shipping, Bangladesh Inland Water Transport Authority (BIWTA), Ministry of Land, Office of the Deputy Commissioners (DC), Ministry of Housing and Public Works, Local Government Engineering Department (LGED), Local Government bodies, National Water Resources Council (NWRC), Executive Committee of the National Water Resources Council, National Environment Committee, Executive Committee of the National Economic Council etc. are supposed to preserve the environment of Bangladesh.

4.3. The Environment Conservation Act, 1995 violation is on rampant

Although there is existing a good number of laws and policies adopted by the Government of Bangladesh, implementation of them is a far cry. The rivers of Bangladesh are getting polluted so alarmingly day by day that they are losing their character as river causing serious threat to the riverine environment and riverine ecology of Bangladesh. Basically the Department of Environment and Forest established under the Ministry of Environment and Forest has been vested with the fundamental duty to monitor how far the industries observe the concerned laws and rules before discharging their effluents into the rivers. Schedule 12 of the Environmental Rules, 1997 sets out the standards for sectorwise Industrial Effluents or Emissions as per requirement of section 12 of the Environment Conservation Act, 1995 (as amended violating the relevant laws. The High Court Division of the Supreme Court of Bangladesh in a verdict on June 23, 2009 ordered closure of the industries if they failed to install effluent treatment plants and other appropriate pollution-fighting devices by 30 June 2010. The DoE conducted a survey on 1319 factories and found that 993 of them did not install effluent treatment plant till the second week of June 2010. It has been found that around 75% of the factories are yet to install effluent treatment plant within the deadline set by the High Court Division which is till 30 June 2010. It is found that the DoE has not been able to punish any such industry up to 30 June 2010 or it could not operate any drive against any industry polluting environment through untreated industrial effluents. Almost all the rivers of the country are under severe contaminated condition due to indiscriminate and rampant discharge of untreated industrial effluents into them either directly or indirectly. The Ministry of Environment and Forests, in January 2010, identified 75 critically polluted areas in the country.

However the DoE started a drive against environment polluters. In its first such drive against the polluters, the DoE for the first time fined eight industrial units in Dhaka and Chittagong Taka Tk 37,48,400 under section 7 of the Environment Conservation Act, 1995.

On 27 January 2011 the Officials of the DoE led a drive in Super Knitting and Dyeing Mills in the Bayezid Bostami area of the port city of Chittagong and found the said factory running its production without effluent treatment. The factory was found discharging its effluents to the river Karnaphuli harming its riverine environment and biodiversity of the adjacent area. The factory fined for Taka 30 lakh and was directed to set up Effluent Treatment Plant within three months. There are around 311 red category industries in and around the capital city of Dhaka having no Effluent Treatment Plant and another 371 industries though has Effluent Treatment Plant but kept them unused. According to a report released by the DoE there are around 18 large knitting and dyeing industries operating in Gazipur, Savar, Narayanganj and Narsingdi that never installed ETP or took any environment clearance certificates. Chandni Textile Mills Ltd and Imam Dyeing, Knitting, Printing and Finishing Industries both situated in Shayampur fall under red category under the Environment Conservation Act, 1995. They have been operating their function for a continuous period of eight years without having any environment clearance certificate and are held responsible for discharging nearly 1.17 lakh of untreated liquid waste to the river. On 04 November 2010, four factories namely Tasia Fabrics Ltd, Multifabs Ltd, Zara Composite Textile Ltd and Mymoon Textiles Mills Ltd, were fined Taka 37 lakhs by the DoE officials for discharging untreated effluents into the river Turag. Two of them had been carrying out their functions without environment clearance certificate and the remaining two had Effluent Treatment Plant but were not using them and they were found to discharge around 12 lakh cubic metres of untreated liquid waste in the river Turag.

5. Recommendations

The above-mentioned deliberations focus on the fact that the rivers of Bangladesh are not in a fit condition and are constantly getting contaminated due to indiscriminate and random discharge of untreated industrial effluents into them. So to save the rivers from such contamination the following initiatives, inter alia, may be adopted, namely:

(i) there shall be a Monitoring Cell comprising persons having expertise in the matter of environmental pollution under the auspices of the Department of Environment and Forest which will carry out regular monitoring whether the industries are observing the provisions imperative upon them under the Environment Conservation Act, 1995 and the Environment Conservation Rules, 1997;

(ii) It has been found by the drives carried out by the DoE officials that most industries have been carrying on their operation without installing ETP; so permission should not be given unless and until the DoE is satisfied that the concerned industry has installed ETP effectively;

(iii) Before the amendment brought to the ECA in 2010, neither the ECA nor the ECR did contain any provision for holding polluters liable for criminal offence; however in 2010 the ECA was amended and penal provisions had been inserted for the purpose of holding the violators of environmental laws liable to undergo physical punishment. But no violators have been jailed so far to date though violation is rampant. So the penal

provisions of both the ECA (as amended up to 2010) and the Paribesh Adalat Ain, 2010 should be strictly implemented.

(iv) It has been found that most industrial units have been established either directly on the banks of the rivers or very close to the river banks facilitating direct and uninterrupted discharge of effluents into the rivers. So in future no industrial unit should be allowed to be established in such areas.

(v) It has also been found that the entrepreneurs at the primary stage when they apply for environment clearance certificate from the DoE, install ETP, after getting such certificate keep those ETP inoperative for avoiding cost for the treatment of the effluents. So such shrewd entrepreneurs should be given exemplary punishment so that other entrepreneurs learn from it.

(vi) A study should be carried out on the rivers which have already been polluted by discharge of the untreated industrial effluents. The industries responsible for such contamination shall be ordered to shoulder the responsibility of cleaning them under auspices of the DoE.

(vii) Mass level awareness should be raised about the fact that our rivers are facing serious consequences due to frequent discharge of untreated effluents into them.

(viii) The rivers which have been narrowed or unfortunately filled up should immediately be drained so as to bring them back to their normal condition so that there can be normal flow of water.

(ix) Besides the DoE, the District Administration should be vested with the duty of monitoring in its concerned district whether any industry is discharging untreated effluents to the rivers.

(x) The ECA provides that the DG preserves the power to warn the untreated effluents emitters of the disconnection of gas line, water or electricity but for what magnitude of discharge of untreated effluents those disconnections shall be ordered has not been clarified in the ECA or ECR. There shall be such clear mentioning of discharge of untreated effluents.

(xi) It has been observed that increasing control of the Parliament by the industrialists is getting intensified day by day and the supreme legislative body is gradually going out of the control of the real politicians. On the other hand industrialists are the major contributors to the pollution of riverine environment. So legislative enactments by such a Parliament basically preserves the interest of the industrialists. Consequently it has been impracticable to get adequate and effective legislative weaponry from such industrialist dominated Parliament. To this effect, the Law Commission should be made more powerful and provisions should be made in such a way that the legislative assembly remains under the control of real politicians.

6. Concluding remarks

Obviously as an element of natural resource, rivers are part of the bounties on earth, more than an amenity, a treasure which have contributed to the distribution of human habitation on this planet (Farooque, 2009). Since time immemorial rivers often have been described in literature as a metaphor for war, love, power, peace, happiness and so on.

Rivers of Bangladesh are no exception here. They have contributed to the history, literature, pattern of life both at domestic and national levels. As the proverb goes, machhe-bhate Bangalee, that is, Bangalees are dependent on rice and fish and the rivers of Bangladesh provide almost 75% of the protein intake for the Bangladeshi people. Besides, rivers of Bangladesh also contribute to the transportation of goods from place to place in an easier, less expensive and more expeditious way. The above mentioned condition of the rivers of Bangladesh proves that rivers are no longer in the condition in which they had once been or as they are supposed to be. Indiscriminate discharge of untreated industrial effluents and domestic wastes into the rivers has already turned many of them into a moribund condition. If the situation does not change, Bangladesh will face serious consequences. So, necessary steps including those recommended should urgently be taken so as to save the rivers from pollution.

References

- I) Er Rashid, Harun, (2002). "River, Water and Wetlands", Bangladesh Environment Facing the 21st Century, 2nd ed, *Society for Environment and Human Development (SEHD)*,
 - II) Farooque, Mahiuddin, (2009) International Rivers: Rights of the Riparian States, *Bangladesh Environmental Lawyers Association*, (Dhaka), pp.2 & 363.
 - III) R. Roy, A.N.M. Fakhruddin, R. Khatun, M.S. Islam, M.A. Ahsan, A. J. M. T. Neger, "Characterization of Textile Industrial Effluents and its Effects on Aquatic Macrophytes and Algae", *Bangladesh Journal of Scientific and Industrial Research*.
 - IV) Shameem Ara Begum, M. Jahangir Alam, Syed Shayfur Rahman and M. Mizanur Rahman, (2010) "Effect of Industrial Effluents on the Germination and Seedling Growth of Three Leafy Vegetables", *Bangladesh Journal of Scientific and Industrial Research*, Bangladesh J. Sci. Ind. Res. 45(2), pp.101-104,.
 - V) Siddiqui, MS (2010) "Managing industrial waste and protecting environment in Bangladesh", *The Financial Express*, Vol 18 No -102 Regd No DA 1589 | Dhaka, Friday July 2.
- The Environmental Conservation Act, 1995.
- <http://www.eionet.europa.eu/gemet/concept?cp=4229>; accessed on 10.02.2011.
- <http://www.science-dictionary.com/definition/industrial-effluent.html>; accessed on 10.02.2011.
- <http://qna.rediff.com/questions-and-answers/definition-of-industrial-effluent/11775899/answers>; accessed on 10.02.2011.
- Bangladesh Environment, Facing the 21st Century, Second Edition, p. 186.
- <http://www.academicjournals.org/ijwree/PDF/pdf%202010/Dec/Islam%20et%20al.pdf>; accessed on 11.02.2011.
- http://www.rrcap.unep.org/pub/soe/bangladesh_water.pdf Accessed on 19.02.2011