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THE EFFECTS OF THE FARAKKA BARRAGE ON BANGLADESH AND INTERNATIONAL LAW

Introduction

India has constructed a barrage across the Ganges at a place called Farakka, about 17 kilometres upstream from the western borders of Bangladesh with India. Named after the place, the barrage is popularly known as the Farakka barrage. The barrage is intended to divert a certain portion of the Ganges dry season flow into the Bhagirathi-Hooghly river of India to flush the Calcutta port with siltfree water, to improve the navigability of the port by providing sufficient water during the dry season.[1] In Bangladesh, the whole range of economic, social and private life pattern in the Ganges delta have emanated from and are sustained by the historic uninterrupted flow of the Ganges since time immemorial.[2] Bangladesh is particularly dependent

1. *India—1970*, Research and Reference Division, Ministry of Information and Broadcasting, Government of India, p. 292.
2. The origin of the land of Bangladesh was the deposition of materials transported by its rivers. The land bordering the south of the Ganges was formed by that river which has moved steadily eastwards during the past few centuries. And the very survival of peoples residing in the Ganges delta is inextricably linked with the lifegiving water of the Ganges. See the *Krug Mission Report*. In 1956, the UN through the technical assistance administration set up a mission with Mr. J.A. Krug as the leader to draw a basis of comprehensive programme of water resources in the then East Pakistan, now Bangladesh. For an extract of the report, see The *Bangladesh Times*, 12 and 13 August 1974 ; also, Z.A. Khan ed., *Basic Documents on Farakka Conspiracy*, Dhaka, 1976, pp. 33-38.

on the Ganges dry season flow for irrigation, inland navigation and preventing the intrusion of salinity from the sea.

Bangladesh maintains that the withdrawal of the Ganges dry season flow at Farakka has continuously been inflicting substantial damage on its territory ever since the commission of the barrage in 1975. The impacts of the Farakka barrage on Bangladesh, as we shall observe in the discussion to follow, are immediate, widespread and devastating. Is India legally entitled to operate the barrage irrespective of its serious damaging effects on Bangladesh ? This question involves the international legal issue of the right of a state to carry out activities within its territory having considerable repercussions beyond its national boundaries. An examination of this matter reveals that a state cannot lawfully use its territory to the detriment of another state and is liable for extra-territorial damages. Relying on this legal posture, it is submitted that international law does not allow, rather forbids, India to operate the Farakka barrage in a manner seriously injurious to Bangladesh.

The Effects of the Farakka Barrage on Bangladesh

The effects of the Farakka barrage on Bangladesh have received considerable scholarly attention. These effects have been explored in numerous ways.[3] Consequently, it has not been thought essential to dwell on these effects at great length, except only a synthesis of them. What needs to be mentioned here serves merely a background to the subsequent legal analysis.

3. For an account of these effects, see H.R. Khan, "Effects of Farakka Barrage on Bangladesh' The *Bangladesh Times*, 11 April 1976 ; M. R. Tarafder, 'Water : Vital Resource for Life' The *Bangladesh Observer*, 25 Sept. 1976 ; *White Paper on the Ganges Water Dispute*, Government of Bangladesh, Sept. 1976, pp. 6-10 ; *Deadlock on the Ganges*, Government of Bangladesh, Sept. 1976, pp. 3-4 ; Z.A. Khan, *op. cit.* 1-23 ; B.M. Abbas, 'The Critical Water Situation' The *Bangladesh Observer*, 12 March 1984, p. II ; also generally, B.M. Abbas, *The Ganges Water Dispute*, University Press Ltd,. Dhaka, 1982,

The most immediate consequence of the withdrawal of water at Farakka is the simultaneous reduction of the Ganges flow and level in Bangladesh. The reduced water discharges and level have altered the river condition in Bangladesh to the grave detriment of its economy, ecology and environment. The diversion of siltfree water from the Ganges into the Hooghly necessarily means the passage of more silt into the Ganges in Bangladesh and a corresponding rise in the river bed. The reduced flow has caused huge shoal formations in the river bed, thereby increasing flood hazards in the monsoon. Abrupt changes in discharges, water level and sediment have resulted in hydraulic, hydrological and morphological imbalance. Deteriorated river conditions with silted up beds althrough its length in Bangladesh has drastically impeded the inland navigation of Bangladesh. This condition is also repeated in the tributaries of the Ganges in Bangladesh.[4]

The changed river condition has also decreased the capacity to irrigate. A significant number of irrigation pumps and projects are hampered and rendered inoperative in every dry season. The Ganges-Kobadak irrigation project, the biggest in Bangladesh, is designed to

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pump water from the Ganges to feed the main and subsidiary canals. The main pumps face operational difficulties due to increase in lifts. As a result, the project fails to irrigate even half of the acres of programmed irrigation in 1984.[5] A shortage of water causes delay in

4. See, *Dainik Barta*, Rajshahi, 8 Feb. 1984, p. 6 ; *Ittefaq*, Dhaka, 29 March 1984; *Dainik Barta*, Rajshahi, 14 April 1984, p. 4.
5. See, The *Bangladesh Observer*, 2 April 1984, p. 1, col. 1 ; *Dainik Bangla*, 23 March 1984, p. 1 ; *Dainik Barta*, Rajshahi, 22 March 1984, p. 1, col. 1 ; *Ibid.* 23 March 1984, editorial ; *Ibid.* 14 April 1984, p.4.

planting crops, decrease yield, shorten growing season and affects the productivity of subsequent crops.

Low water level in the Ganges and its distributaries has curtailed the landing of fish. This is also because of the disturbances of historic and traditional food chain caused by the physical, chemical and biological change of rivers and the inability of fish to tolerate shallow depth and unprecedented salinity. Reduced fish catch in the Ganges and its distributaries has affected the livelihood of millions of fishermen, supply of cheap protein and earnings of foreign exchange. Diminished water level has given rise to another acute problem of lowering the underground water level in the lean months which puts innumerable irrigation tube-wells—hand, shallow and deep—out of action. Reduced water level, both surface and ground, also adversely affects the general moisture condition and the municipal and domestic uses of water in the Ganges delta area.

All in all, the Ganges has been playing a crucial role in the economic development of Bangladesh and has a potential for its future development. The withdrawal of the Ganges dry season flow at Farakka has been causing grievous effects and their inbuilt multiplier effects have inflicted cumulative, progressive and permanent damage on the territory of Bangladesh.[6]

International Legal Principle and Practice Governing the Utilisation of Common Waters

The effects of the Farakka barrage on Bangladesh quite pertinently lead one to pose a question : Is India entitled in international law to operate the barrage regardless of its serious damaging effects on the territory of Bangladesh ?

6. It has recently been estimated that Bangladesh has incurred a national loss of taka three thousand and six hundred crores during the last eight years from 1976 to 1983, equivalent to an average loss of taka four hundred and forty-nine crores per year. See *Dainik Barta*, Rajshahi, 8 April 1984, p. 1 ; *Ibid* 9 April 1984, editorial.

A riparian state has the legal right to utilise the water of an international river in its territory if its doing so causes no injury or only a minor injury to co-riparian states.[7] All major interference by a riparian state with the water of an international river within its territory that seriously affects the use and enjoyment of the same water system by co-riparian states having rightful shares is illegal.[8] This principle is amply recognised in customary international law regulating the right of riparian states to use the segments of an international river flowing within their territories.[9]

There is unanimity among judicial decisions that each riparian state has a rightful share and interest in the water of an international river which should be respected and taken into consideration by co-riparian states in utilising the water of the river in their territories. There is a frequent and consistent judicial rejection of the contention that a riparian state is free to use the water of an international river in its territory, disregarding the effects that it may cause to co-riparian states. While all uses having serious harmful effects on others have always been decided unlawful, there is no known court or tribunal that has held otherwise.

In the *Lake Lanoux case*,[10] Spain demonstrated that under customary international law no major alteration of an existing regime

7. C.B. Bourne, 'The Right to Utilize the Waters of International Rivers' *Canadian Yr. Int'I. L.*, vol. 3(1965), pp. 188-220.
8. *Ibid.* 221-59.
9. W.L. Griffin, 'The Use of Waters of International Drainage Basins Under Customary International Law' *Am. J. Int'I. L.*, vol. 53(1959), p. 50.
10. In 1917, France contemplated using the Lake Lanoux, a French river, as a reservoir and then diverting its water to the Ariege, another French river, where it could profit by producing hydro-electric energy. The planned diversion was designed to withdraw 25 per cent of the Carol flow, a river flowing from France to Spain. The Carol water was used by Spanish farmers. Spain raised objections against the plan. From 1917 to 1957, they conducted bilateral negotiations in vain. In 1957, the dispute was eventually settled by the Lake Lanoux Arbitral Tribunal. For facts and decision, see B. MacChesney, 'Judicial Decision : Lake Lanoux Case' *Am. J. Int'l. L.*, vol. 53 (1959), p. 156 ; J.G. Laylin and R.L. Bianchi, 'The Role of Adjudication in International River Dispute : The Lake Lanoux Case' *Ibid.* 30 ; also *Int'I. Leg. Rep.*, vol. 24(1957), p. 101.

could be undertaken that would seriously affect a co-riparian state. Admitting the Spanish position, the tribunal stated that 'there exists a principle prohibiting the upstream state from changing the water of a river in their natural conditions to the serious injury of a downstream state'.[11] The tribunal however did not apply this principle in the case because, as indicated in the award, the French project had no adverse effect on downstream Spanish farmers.[12] Implicit in this award was the indication that had the project caused injury to Spain, the tribunal would have applied the principle. It is noteworthy that France conceded the soundness of the statement. France admitted that it would have been responsible if the project had inflicted damage on Spain.[13] France of course pleaded that by the restitution of an equal amount of water there would be no change in the water regime in Spain which was eventually established before the tribunal.

Certain federal court decisions on inter-state water disputes where the courts have relied on international law, or municipal law which is in conformity with international law, in deciding cases may profitably be cited in this respect. In *Wyoming* v. *Colorado*, the US Supreme Court rejected the contention of Colorado that a state may rightfully dispose, as it may choose, the water of an inter-state stream flowing within its territory, heedless of any prejudice that it may work to others possessing rights in the same stream.[14] A similar statement made by Colorado in *Kansas* v. *Colorado* was adjudged untenable by the Court.[15] In the *Chicago Diversion Case*, the Court held that 'a diversion of water in one state, which causes a lowering of water levels in other states and thereby does substantial injury to their interests, is illegal'.[16] The decision of the Court in *North Dakota* v. *Minnesota*

11. Griffin, *op.cit.* 63 ; *Int'I. Leg. Rep.*, vol. 24(1957), p. 129.
12. *Ibid.*
13. Griffin, *op.cit.* 62.
14. (1922) 259 US 419 ; Griffin, *op.cit.* 68.
15. (1902) 185 US 143 ; (1907) 206 US 46 ; Griffin, *op.cit.* 68.
16. I.Q. Dealey, 'The Chicago Canal and St. Lawrance Development' *Am. J. Int'I. L.*, vol. 23(1929), p. 310.

may by illustrated to the same effect.[17] The Supreme Court of Italy upheld a similar principle in *Socete Energie Electrique* v. *Compagnia Imprese Elettriche Liguri*.[18]

The treaty practice of riparian states also bear evidence that a riparian state is accountable to co-riparian states for any injury that results from the use of a common river in its territory. The number of such treaties is very large, enumerating an obligation similar in form and substance. In consequence, a small sample of them need be given here.[19] A riparian state is required to maintain the natural channel of the river in such a condition as to avoid any obstruction to

17. (1923) 263 US 365. The defendant built obstructions in a river within its territory to raise its level for its own purpose which led to regular flood in the territory of plaintiff. The court enjoined the defendant not to inundate the downstream plaintiff. See, P. Sevette, 'Legal Aspects of the Hydro-Electric Development of Rivers and Lakes of Common Interests' UN Doc. E/ECE/136 (1952), pp. 73-74.

18. *Annual Digest of Public International Law Cases*, vol. 9(1938-40), p. 121.

19. The treaty between Russia and Lithuania of 12 July 1920, Art. 2, Remark 4, *League of Nations Treaty Series*, vol. 3(1921), p. 126 ; the treaty of Riga between Russia and Latvia of 11 Aug. 1920, Art. 3(3), *Ibid.* vol. 2(1920-21), p. 214; the Franco-British convention of 23 Dec. 1920, Art. 3, *Ibid.*, vol. 22(1923-24), p. 357 ; the treaty between Russia and Estonia of 2 Feb. 1920, Art. 16 (Annex 3), *Ibid.* vol. 11(1922), p. 69 ; the convention between Finland and the USSR of 28 Oct. 1922, Art. 3, *Ibid.* vol. 19 (1922-23), p. 194 ; the treaty between Hungary and Romania of 14 April 1924, Art. 2, *Ibid.* vol. 46 (1926), p. 43; the treaty between Norway and Finland of 14 Feb. 1925, Art I, *Ibid.* vol. 49(1925-27), p. 388 ; the treaty between France and Germany of 4 Aug. 1925, Art. 14, *Ibid.* vol. 75 (1928), p. 268 ; the protocol between France and the UK of 31 Oct. 1931, *Am. J. Int'l. L.*, vol. 50 (1956), p. 88 ; the frontier agreement and the exchange of notes between Afghanistan and the USSR of 13 June 1946, *UN Treaty Series*, vol. 31 (1949), p. 158; the treaty between Austria and Yugoslavia of 16 April 1954, *Canadian Bar Rev.* vol. 33 (1955), p. 1021 ; for some more treaties with similar provisions, see *UN Legislative Series : Legislative Texts and Treaty Provisions Concerning the Utilization of International Rivers for Other Purposes Than Navigation*, UN Doc. ST/LEG/SER.B/12 (1963), pp. 260, 757, 827, 928 ; also, above note 17, Sevette, pp. 96, 98, 109-14, 122 and 138.

the flow in the channel likely to cause material damage to co-riparian states is embodied in the 1960 Indus water treaty between India and Pakistan on a number of occasions.[20] It was agreed in the 1929 Nile water agreement that no measures would be taken in Sudan which would entail any prejudice to Egyptian interests.[21] An identical provision was also incorporated in the 1949 and 1950 Exchange of Notes

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between the UK and Egypt on the construction of the Owen Dams.[22] The 1963 Act of Naimey between the Nigar basin states (Cameroon, the Ivory Coast, Dahomey, Guinea, Upper Volta. Mali, Niger, Nigeria and Chad) stipulates that none of them is entitled to embark on any unilateral action on the basin that would affect others adversely.[23]

There is a widespread acknowledgment of the principle in a large number of treaties that riparian states are responsible for the effects of their use of common waters on others. It may however be argued that treaty provisions themselves do not become binding on third parties. It ought to be borne in mind in arguing along this line that there is a general acceptance of treaties as a source of customary international law.[24] The content of specific and similar provisions in a number of treaties are received into customary international law. The existence of customary international law or of practice accepted as law

20. Arts. 4(2), (3a), (3c), (6), (7) and (12ii), *Am. J. Int'l. L.*, vol. 55(1961), p. 797.
21. *League of Nations Treaty Series*, vol. 93 (1929), p. 44.
22. *UN Treaty Series*, vol. 226 (1956), p. 274.
23. *Ibid.*, vol. 587 (1967), p. 9, Art. 4.
24. R.D. Hayton, 'The Formation of the Customary Rules of International Drainage Basin Law' in Garretson, Hayton and Olmstead ed., *The Law of International Drainage Basins*, 1967, pp. 861-71 ; F. J. Berber, *Rivers in International Law*, 1959, pp. 128-56.

may be derived from specific and identical clauses in a considerable number of treaties. For they furnish evidence of what the contracting states are agreed that the law should be in that particular field. In using the water of an international river, there is a significant number of treaty practice bearing evidence that riaparian states have consistently felt an obligation to take into account the effects of utilisation on co-riparian states. It may therefore be inferred that an obligatory principle of customary international law has developed through these definite and similar treaty provisions.

In a similar vein, the associations of international lawyers have expressed their views on the point. Both the 1919 Madrid Declaration and the 1961 Salzburg Resolution adopted by the Institute of International Law prohibit all utilisation of an international river by a riparian state in its territory which strongly affects the possibility of use of the same water by co-riparian states in their territories.[25] Such a principle was considered by the Inter-American Bar Association as a part of existing international law applicable in every international river.[26] The International Law Association proscribes any use of an international water by a riparian state that adversely affects the equitable utilisation of the same water system by co-riparian states.[27] These statement of international lawyers, both inter-governmental and voluntary non-governmental, have contributed significantly to the formulation and systematisation of international legal principles regarding the utilisation of the waters of international rivers. They are the outcome of long, careful and intensive study and investigation by various committees on the uses of international river consisting of eminent and influential international legal experts. As such, their authority seems to be no less compelling.

25. Arts. 1 and 2 of the Madrid Declaration, above note 17, Sevette, p. 261 and Art. 4 of the Salzburg Resolution, *Am. J, Int'l. L.*, vol. 56 (1962), pp. 737-38.
26. The 1957 Buenos Aires Resolution, *Inter-Am. Bar Association Procd.* vol. 10 (1957), p. 82.
27. The 1966 Helsinki Rules, Report of the 52nd Conference, 1966, p. 487.

An impressive number of authors purports to support the view that all serious interference by one riparian state with the use and enjoyment of an international river by another is unlawful. Oppenheim, for example, unequivocally asserts that a riparian state is forbidden to stop or divert or make such use of the water of an international river 'as either cause danger to the neighbouring state or prevents it from making proper use of the flow of the river on its part'. He further claims that this follows from the 'rule of international law that no state is allowed to alter the natural conditions of its own territory to the disadvantage of the natural conditions of the territory of a neighbouring state'.[28] Laderle states that each state is restricted in its right of dealing with the waters in its territory to the extent that such dealing is likely to prejudice a detrimental reaction on another state.[29] Max Huber holds that those developments are unlawful which injure another state.[30] Sausar-Hall maintains that 'no diversion of a stream which is of a character to strongly prejudice other riparians, is a generally recognised principle.[31]

The authorities referred to clearly corroborate the notion that it can never be the legal right of a riparian state to deprive another

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riparian state of its rightful share of the common water and cause injury therein if it happens, by its location, to be in a position to control the supplies of water they share. On the other hand, it is the genuine lawful right of a riparian state, which by the reason of its location is placed in a disadvantageous position, to continue to enjoy its right on the common water supplies. The land over which the Ganges

28. L. Oppenheim, *International Law—A Treatise*, vol. 1 (8th ed, 1955), pp. 474-75.
29. L.M. Lecaros, 'International River : The Lauca Case' *Indian J. Int'l. L.*, vol. 3 (1963), p. 139.
30. *Iibd.* 137.
31. Above note 9, Griffin, p. 59.

happens to pass first belongs, and is subject, to the territorial control of India. If India can and chooses to do so, it can use up all of the Ganges water and leave the rest of the river in Bangladesh only a dry bed. If the right of India to do so is unlimited, this means that there is no legal impediment to prevent India from exploiting the Ganges water solely to its own benefit. Acknowledgement of such a right tantamounts to legitimise the right of India to take away the Ganges water in Bangladesh and to inflict serious damage therein. Conceding such a right may turn the situation into a source of international friction. Such a situation is very likely fraught with the risk that the frustrated and deprived riparian state may have recourse to unilateral action outside the law, which may endanger peace and security of the region.[32] More prominently, the recognition of such a right indeed implies the disavowal of accepted norms of international law and the establishment of a new precedent contrary to international practice.

Salt Pollution Caused by the Farakka Barrage and International Law of Water Pollution

The diminished fresh water flow of the Ganges during the dry months has resulted in an increase in the saline intrusion in the coastal areas of Bangladesh to a degree not foreseen before. The southern districts of Bangladesh are subject to tides from the Bay of Bengal. These tides bring saline water which travel along the rivers and overflow into adjacent lands leaving salt deposits. If there is an increase in fresh water flow, the saline water is pushed back into the sea and vice-versa. Historically, the inland salinity penetration is counteracted by upland flows coming down through the Ganges and its distributaries. Salinity encroachment has increased and advanced far inland with the decrease in upland flows because of the massive Farakka water withdrawals.[33]

32. Pakistan talked of war when India cut off the Indus water supply for irrigation in Pakistan. The violent Arab-Israel dispute over the sharing of the Jordan river water may also be cited in the same vein.

33. See the sources cited in above notes 3-5 and their accompanying texts.

This increased saline intrusion has altered the quality of water varying its temperature and chemicals. Such a change in the quality of water may be tantamount to water pollution in terms of international law. The water pollution is, in the language of the 1966 Helsinki Rules of International Rivers, 'any detrimental change resulting from human conduct in the natural composition, content, or quality of the waters of an international drainage basin'.[34] The increased salinity has altered the natural content or composition of the Ganges water in Bangladesh to the detriment of its territory. It has been brought about artificially through the conduct of a riparian state. Moreover, the Helsinki Rules has categorically regarded salinity as a form of water pollution which has been explained by a hypothetical example.[35]

Referring to the law of water pollution, the Helsinki Rules recommends that it is the international legal responsibility of a state to :

(i) prevent any new form of water pollution or any increase in the degree of existing water pollution in an international river which would cause substantial injury to the territory of a co-riparian state : and

(ii) take all reasonable measures to abate existing water pollution in an international river to such an extent that no substantial damage is caused to the territory of a co-riparian state.[36]

That salinity constitutes water pollution may be well exemplified by referring to the Colorado river salt pollution controversy between the US and Mexico. Salinity is a usual feature of the Colorado river. In 1961, the problem of salt pollution in the Mexican section of the river took a serious turn when highly saline water from the Wellton-Mohawk Irrigation and Drainage District in Arizona were pumped

34. Above note 27, p. 494. The ECE has defined water pollution as 'any alteration in the composition or condition of water directly or indirectly as aresult of the activities of man, so that it becomes less suitable for use', UN Doc. E/ECE/311, para. 4.
35. Above note 27, pp. 500-1.
36. Above note 27, pp. 496-97.

into the Colorado river. The salt concentration of the Colorado water delivered to Mexico went up from the existing level of 800 parts per million (PPM) to 1500 PPM in 1962. This increased salinity caused considerable damage to Mexican agriculture and irrigation. Mexico alleged that the act was a form of contamination of international water by one of the riparian countries, and that such an act was distinctly and specifically prohibited and condemned by international law.[37] In response to Mexican protests, a series of interim measures were adopted by the US between 1962 and 1972.[38] In 1973, a permanent agreement was reached on the issue. The agreement obliged the US to deliver the Mexican share of the Colorado water with an annual average salinity level of no more than 115 PPM, plus or minus 30 PPM, over the annual average salinity of the Colorado river.

The Colorado river salinity control act was subsequently passed by the US Congress in 1974 authorising funds for the works needed to meet the obligation of the US to abate salinity in the Colorado river. The US constructed the most expensive and largest reverse osmosis desalting plant in Arizona.[39] It has been argued that the US was responsible in international law for the salt pollution in the Colorado river and, as such, was also liable for damages caused to Mexico by the delivery of overly-saline water. The strongest indication of the awareness of the US of its liability for damages is that it never allowed the dispute to be arbitrated by a tribunal. Instead, the US took a number of practical steps to reduce the degree of salinity in the Colorado river.[40]

State and treaty practice quite often support the prevention of water pollution. Each party to the 1960 Indus water treaty agreed to

37. H. Brownell and S.D. Eaton, 'The Colorado River Salinity With Mexico' *Am. J. Int'l. L.*, vol. 69 (1975), p. 256.

38. D.G. LeMarquand, *International Rivers : The Politics of Cooperation*, (1977), p. 25.

39. *Ibid.* ; also, M. B. Holburt, 'International Problem of the Colorado River' *Natural Resources J.*, vol. 15 (1975), p. 11.

40. M.E. Bulson, 'Colorado River Salinity Problem' *Int'l. Lawyer*, vol. 9 (1975), p. 291.

prevent pollution of the Indus water system which might affect adversely the uses of the other and to take all reasonable measures to ensure that it would be treated in such a manner as not materially to affect the use of the other.[41] The US and Canada have incorporated provisions for combating the problem of water pollution in the 1909 boundary water treaty. They have agreed that the boundary waters shall not be polluted on either side to the injury of the other.[42] To these illustrations must also be added many more agreements, arrangements and administrative machineries generated especially to deal with the problem of water pollution.[43]

International case law relevant to water pollution is scarce. In fact, there is no known case of water pollution that has been dealt with by an international tribunal. The only known analogous case is the *Lake Lanoux Case* where the tribunal, in discussing the probable bases of the responsibility of France in operating the project, focused some light on the liability of a riparian state for water pollution. It declared that Spain 'could have been argued that the works would bring about a definitive pollution of the waters of the Carol or that the returned waters would have a chemical composition or a temperature

41. Art. 4 (10) ,above note 20.

42. Art. 4, above note 19, UN Legislative Series, p. 260. Their joint rivers commission considered the problem of trans-boundary water pollution on several occasions and recommended certain measures for its suppression. See A.P. Lester, 'River Pollution in International Law' *Am. J. Int'l. L.*, vol. 57 (1963), pp. 842-44.

43. For example, the 1963 accord on the protection of the Rhine river pollution between Germany, France, Luxembourg, the Netherlands and Switzerland, LeMarquand, *op. cit.* 95 ; the 1934 treaty between Belgium and the UK, Art. 3, *League of Nations Treaty Series*, vol. 190 (1938), p. 103 ; the 1960 convention between Baden-Wurttenberg, Bavaria, Austria and Switzerland on the protection of the Lake Constance water ; the 1962 convention between France and Switzerland on the protection of the Lake Geneva water against pollution ; a compilation of similar treaties may be found in E.J. Manner, Water Pollution in International Law' in *Aspects of Water Pollution Control*, WHO (Public Health Papers no. 13, 1962), pp. 55-57 ; also, J. Barros and M.D. Johnston, *The International Law of Pollution*, (1974), pp. 69-173.

or some other characteristics which could injure Spanish interests'.[44] This statement of the tribunal purports to affirm the existence of a general duty of a riparian state not to pollute common waters to the detriment of another. In operating the hydro-electric project, France was under an obligation not to pollute the Carol river water which would injure Spanish interests. It may therefore be reasonable to deduce that had Spain argued and exstablished any present or future damage caused by pollution brought about through the project, the tribunal would have definitely reckoned with such factors in deciding the dispute. Since Spain did not allege and argue this possibility, the tribunal felt it could not consider it.

In *New Jersey* v. *City of New York*,[45] the defendant was enjoined to desist from the practice of depositing of sewage by dumping it into the sea, a practice which was injurious to the coastal areas of New Jersey. Cases such as *New York* v. *New Jersey*[46] concerning the pollution of the New York Bay and *Missouri* v. *Illinois*[47] may be cited to show the general duty of a riparian state to abate the pollution of common waters.

A large number of opinions expressed by authors and recommendations made by interntional organisations, including the UN and its specialised agencies prohibit a state from polluting international waters detrimental to another state.[48] In analysing the bases of liability for water pollution, Lester points out the general principles and rules of international law. He finally summarises and concludes : Most definitions of the general duty of a state not to pollute the waters of an international drainage basin flowing within its territory prohibit such pollution if it causes injury—usually substantial injury—to another state.[49]

44. Above note 10, MacChesney, p. 160.
45. (1931) 283 US 473 ; *Am. J. Int'l. L.* (supl.), vol. 35 (1941), p. 715.
46. (1921) 256 US 296, 309 ; *Am. J. Int'l. L.* (supl.), vol. 35 (1941), p. 715.
47. (1906) 200 US 496, 521 ; *Am. J. Int'l. L.* (supl.), vol. 1 (1907), p. 215.
48. Manner, *op. cit.* 58-63.
49. A. Lester, 'Pollution' in above note 24, Garretson, Hayton and Olmstead, p. 112 ; also, D.A. Gentz, 'US Approaches to the Salinity Problem on the Colorado River' *Natural Resources J.*, vol. 12 (1972) ,p. 506.

Pollution has now become a crucial problem. It can cause enormous economic damage from relatively small polluting sources. Consequently, efforts have been intensified to abate existing pollution all over the world. Reciprocal obligations proscribing pollution run throughout the range of inter-state relationships. In this age when the potentiality of disaster occasioned by nuclear or space activities,

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Seen in the perspective of international law India is under an obligation not to cause intrusion of saline water from the sea into the Ganges in Bangladesh.

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or even by factory waste and the escape of dangerous substances is enormous, the control of pollution by appropriate international law is widely recognised by the international community. The international law of water pollution censures and forbids any kind of water pollution that seriously affects others and obligates the polluting riparian state to adopt measures to prevent or at least to minimise it.

When there is a worldwide trend towards the abatement of existing water pollution, it is very difficult to reconcile the creation of new pollution in the Ganges in Bangladesh. The major direct adverse effect of salinity is felt on agriculture, fishery, forestry, power generation, industry and livestock leading to both short and long run impacts on health and expected mortality.[50] Seen in the perspective of international law of water pollution, India is under an obligation to operate the Farakka barrage in such a manner not to bring any saline water from the sea into the Ganges or not to enhance the degree of existing salinity in the lower reaches of the Ganges in Bangladesh.

Environmental Damage Caused by the Farakka Barrage and International Environmental Law

Social customs, living and human environment in the Ganges delta areas in Bangladesh are shaped by the river. The drastic

50. See the sources cited in above notes 3-6.

reduction of the Ganges dry season flow and increased salinity intrusion have disrupted the entire environmental and ecological balance of the region. Such an abrupt change in the balance of nature has profound adverse effects on the extensive aquatic life. The vegetation and wild-life in the Sundarbans are now endangered. Many people, animals and wildlife have gradually started migrating to sweet water areas. General moisture conditions of the region has deteriorated with the rise in temperature and decrease in humidity.[51]

International environmental law prevents a state from carrying out in its territory any activities which would damage the environment and ecosystem of another state. It is an international legal duty of the undertaking state to ensure that activities within its territory would not inflict injury to the environment of its neighbours. The UN has actively been engaged in the protection and enhancement of international human environment.[52] The 1972 Stockholm Declaration of the UN Conference on the Human Environment laid down the principles that states have the responsibility to ensure that activities within their jurisdication do not cause damage to the environment of other states or of areas beyond the limits of national boundaries.[53] Affirming the Stockholm principles, the 1972 General Assembly Resolution stated that they lay down the basic rules governing environment. It was further resolved that 'in the exploration, exploitation and development of their natural resources, states must not produce significantly harmful effects in zones situated outside their national jurisdiction'.[54] Similarly, Article 30 of the Charter of Economic Rights and Duties of

51. *Ibid.*
52. For the UN action plan and institutional and financial arrangements for the human environment, see the British Institute of International and Comparative Law ed., *Selected Documents on International Environmental Law*, (1976), pp. 6-31.
53. Principles 21 and 22 of the Declaration, *Ibid.* 5; also the Report of the UN Conference on the Human Environment, UN Dec. A/CONF. 48/14 (1972).
54. UN General Assembly Res. no. 2995 (XXVII) and 2996 (XXVII), UN GAOR, 27th session (15 Dec. 1972), supl. no. 30, p. 42.

States,[55] the Economic Declaration of the 1973 Algiers Conference of Non-Aligned Nations,[56] and the 1974 Recommendation of the Organisation for Economic Cooperation and Development[57] also impose a duty upon states not to cause damage to the environment of other states. The EEC has formulated several instruments and action programmes to safeguard and improve the environment of the members of the community.[58]

In the 1973 agreement between the Federal Republic of Germany and the German Democratic Republic, the parties have agreed to exchange information and take counter-measures regarding the occurrence or extension of damage capable of having an adverse effect on the environment of the other.[59] The 1974 convention on the protection of environment between Denmark, Finland, Norway and Sweden contains several provisions for protection and measures to prevent damage caused in another state by environmentally harmful activities.[60]

In the 1973 *Nuclear Test Case* between Australia and France, the principal allegation of Australia was that the atmospheric nuclear explosions carried out by France in the Pacific inflicted enough damage on the environment of Australia by widespread radioactive fall-out on the territory of Australia. The International Court of Justice in

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55. It states that 'all states have the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction', G. A. Res. no. 3281 (XXIX), Dec. 1974, UN. Doc. A/RES/3281 (XXIX).
56. Fourth Conference held on 5-9 Sept. 1973. It states that 'environmental measures adopted by one state should not adversely affect the environment of other states, or zones outside their jurisdiction', UN Decl. A/9330 (1973), p. 72.
57. It recommends that 'states have a responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states', see above note 52, p. 100.
58. For these regulations and mechanisms, see above note 52, pp. 39-91.
59. See above note 52, pp. 117-18.
60. See above note 52, p. 125 ; for some additional treaties on the protection and improvement of international human environment, see *Ibid.* 119-24.

its provisional measures asked France to avoid any further nuclear tests causing injury to the environment of Australia by depositing radioactive fall-out on Australian territory.[61]

It is quite evident that contemporary international environmental law and practice impose an obligation upon every state to conduct its activities within its territory in such a manner which does not affect the environment and ecology of another state. For any such actions,

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The Farakka barrage has in effect disrupted the entire environmental and ecological balance of the delta areas in Bangladesh which tantamounts violation of International Envitonmental Law.

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a state must take full account of the consequences on its own environment and on areas outside its territory.[62] In view of this situation, it seems very difficult to justify any major interference with the environment and ecosystem of Bangladesh that upsets its life-sustaining capacities, especially when the awareness of the obligation for taking full account of its own ecocycle and environment, that of its neighbours, that of the region and that of the world is widely recognised by countries all over the world.

Legal Liability for Extra Territorial Damage Caused by the Farakka Barrage

The foregoing analysis permits to arrive at a conclusion that the withdrawal of the Ganges dry season flow at Farakka is an infringement of customary international law governing the use of common waters. If that is so, it may then logiclally be asked : What are the legal effects which engender from such a violation ?

61. A.E. Evans, 'Jurisdiction of the ICJ Concerning French Nuclear Arms Testing in Pacific' *Am. J. Int'l. L.*, vol. 67 (1973), pp. 783-84 ; also, *Indian J. Int'l. L.*, vol. 13 (1973), pp. 616, 619.

62. The UN Resolution on the 1972 World Environmental Day, see above note 52, p. 32.

In seeking an answer to this question, one ought to recall first the principles of customary international law on the utilisation of the water of an international river. Admittedly, the authorities of customary international law on this point are scanty. Most of them are paradoxically silent on the extent of the legal liability of a riparian state that generates from a failure to use common waters according to the principles they profess. Only a few of them however have touched on this issue ; but they lead to no clear-cut decision. In consequence, an absolute answer cannot be given to the question posed. Nevertheless, it may not be impossible, difficult though, to formulate a tentative answer by drawing an analogy from the decisions of some arbitral tribunals and courts in the event of similar disputes.

To return to the *Lake Lanoux Case* again, the tribunal held that the French project was justified in international law. The basis of the decision was that the operation of the project was not injurious to Spain in any way. Spain, in fact, failed to establish any existing damage or the possibility of any future damage. Indeed, there was no proof of any present damage on Spanish territory. Yet, Spain could have argued about the possibility of future damage, such as, due to the complexity of the proposed work there would be no assurance of the restitution of water equal in quantity or quality to the natural contribution of the Lake Lanoux to the Carol river ; the quality of water might vary due to change in temperature and chemical composition. Failure to produce evidence of any damage barrred the Spanish claim. As such, the tribunal did not go further to determine the nature and extent of French liability. Inherent in this decision is the inference that had Spain argued and established any present injury or the possibility of any future injury even in anticipation, the decision of the tribunal, as indicated clearly in the award,[63] would have been different. And France might have been held liable for that damage.

The International Law Association attaches some legal liability for the abrogation of principles prescribed for the prevention of water

63. See above note 10, MacChesney, p. 160.

pollution in the 1966 Helsinki Rules of International Rivers. It recommends that the state responsible for water pollution shall be required to cease 'the wrongful act' and compensate the injured co-riparian state for the injury that has already caused to it.[64] The US inflicted damage on Mexico by the delivery of overly-saline water of the Colorado river into the Mexican segment of the river. In examining the liability of the US for such damages, it has been pleaded that had the issue been adjudicated, the US would have been held liable to pay compensation to Mexico for the previous damages under international law.[65]

The legal liability of riparian states for a failure to follow the principles of customary international law in using their common waters may also be deduced from the general principles of international law. The principle of customary international law proscribing a riparian state from causing injury to a co-riparian state or states appears to be consistent with, and is a reflection of, the general principle of international law forbidding a state from inflicting extra-territorial damage. A state is under a duty in international law to prevent its territory being used in a manner causing injury to another state. It imposes limitations upon actions that a state may adopt which would cause injury to the territory of another state. This is a widely acknowledged and well-established principle of international law. Oppenheim is of the opinion that 'a state is bound to prevent such use of its territory as, ..., is unduly injurious to the inhabitants of the neighbouring state'.[66] The UN Secretary-General has expressed the view that 'there has been general recognition of the rule that state must not permit the use of its territory for the purposes injurious to the interest of other states in a manner contrary to international law.'[67] In the *Corfu Channel Case*, the International Court of Justice held that the obligations of Albania to notify British warships of the existence of mines in the North Corfu Strait were "based on certain general and well-recognised

64. The 1966 Report of the 52nd Conference, p. 501.
65. See above note 40, pp. 290-91.
66. Above note 28, p. 291.
67. *Survey of International Law*, UN Doc. A/CN. 4. 1/Rev. 1 (1949).

principles" and "a state's obligation not to allow knowingly its territory to be used for acts contrary to the rights of other states" is one of them.[68]

The one who is responsible for an unlawful act is simultaneously also liable for the consequences emanating from the force of the act.[69] International law imposes upon a state the compensatory liability for extra-territorial economic injury resulted from activities within its territory. The most important decision in point is the 1941 award of the *Trail Smelter Air Pollution Case* between the US and Canada. The parties agreed to arbitrate the dispute with regard to damages done by the emission of sulpher dioxide fumes by a privately operated zinc smelter situated at Trail, British Columbia, to the State of Washington by destroying natural and agricultural resources. In deciding the case, the tribunal stated :...under the principles of international law, as well as of the law of the US, no state has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, *when the case is of serious consequence and the injury is established by clear and convincing evidence*[70] (emphasis added).

It was sufficiently and convincingly established before the tribunal that the Canadian smelter had been causing damage by fumes to the US. The tribunal held Canada responsible for the conduct of the Trail Smelter. It did not require Canada to act to close down the smelter. Rather, it held that the smelter should be required to refrain in the future from causing any damage through fumes in the State of Washington, and asked Canada to adopt such measures that would restrict the emission of fumes. The tribunal found that there were past damages and held Canada liable to make appropriate indemnity for such damages to the US.[71]

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68. L.C. Green, *International Law Through the Cases*, (3rd ed. 1970), p. 257.
69. Above note 64, p. 503.
70. 'Trail Smelter Arbitral Decision' *Am. J. Int'l. L.* (supl.), vol. 35 (1941), pp. 716-17.
71. *Ibid.*

Certain analogous decisions of federal courts of sovereign states where courts have applied international law, or municipal law which is in conformity with international law, in adjudicating cases may usefully be cited here. In the suit of *Georgia* v. *Tennessee Copper Company and Ducktown Sulpher, Copper and Iron Company*, the US Supreme Court granted the injunction sought by the plaintiff. The Court observed that an injunction would lie against a sovereign state only where its activities were resulting serious extra-territorial injury. An agreement on the basis of an annual compensation was subsequently reached between the parties.[72] In a suit between the Swiss cantons of Solothurn and Aargau, the Swiss federal court issued an injunction enjoining the use of a shooting establishment in the territory of Aargau on the ground of its injurious effects on the territory of Solothurn. In consequence, Aargau had to revise its existing installations in a manner limiting the possibility of damage. The shooting was however again permitted by the court in a subsequent decision only following the completion of some improvements over the existing arrangements.[73]

A careful examination of these decisions purports to affirm the following points of law :

(a) any considerable extra-territorial injury is *ipso facto* unlawful in international law ;

(b) a state incurs liability under international law when it knowingly permits or fails to prevent conduct within its territory possessing damaging impacts on the territory of another state ; and

(c) where there has been an injury to a state because of a transgression of international law, there is a consequential duty of the offending state to make reparation in an appropriate manner so as to do justice under the circumstances.[74]

72. (1907) 206 US 230 ; *Am. J. Int'l.L.* (supl.), vol. 35 (1941), pp. 715-16 ; also, above note 42, Lester, p. 838.

73. D. Schindler, 'The Administration of Justice in the Swiss Federal Court in Inter-Cantonal Disputes' *Am. Int'l. L.*, vol. 15 (1921), pp. 172-74.

74. *Case Concerning the Factory at Chorzow* (claims for indemnity), (1927) PCIJ ser. A. 1, no. 9, p. 21 ; also the *Corfu Channel Case*, L.C. Green, *op. cit.*

In view of the decisions and law discussed above, it seems reasonable to argue that if an international tribunal is entrusted with the task of arbitrating the dispute over the effects of the Farakka barrage on the territory of Bangladesh, there would be very little chance of adjudicating it in a different way. The most likely decision would

An international tribunal on Farakka may not ask India to stop operation of the barrage but may well require India to desist from causing any further damage and re pay appropriate compensation to Bangladesh for the past losses.

appear to be similar to those referred to. Their authority is undoubtedly compelling. Such a tribunal would very likely be inclined, quite understandably, to lean upon these decisions in ascertaining the dispute. Also, in the presence of these decisions, it would be very difficult for someone to persuade such a tribunal that international law imposes no obligation on India to prevent the barrage being operated in a manner having injurious effects on the territory of Bangladesh.

An analogy drawn from these decisions and law tends to lead one to assert that such a tribunal may not ask India to stop the operation of the Farakka barrage. Nonetheless, it may well require India to desist from causing any future damage to Bangladesh, or to bring necessary improvements over the existing installations minimising the degree of injury. The economic damage that has already, been caused to Bangladesh would very likely to be held unlawful. The damage caused are mostly physical and economic in nature. The recognised manner of reparation for such damages is pecuniary compensation, and its measure extends at least to damages for actual loss.[75] It may

75. *Case Concerning the Factory at Chorzow*, (1928) PCIJ ser. A. 3, no. 17, pp. 31, 46-48; above note 28, pp. 352-54 ; C. Engleton, "Measures of Damages in International Law' *Yale L. J.*, vol. 39 (1929), p. 52 ; also W. Bush, 'Compensation and the Utilization of International Rivers and Lakes : The Role of Compensation in the Event of Permanent Injury to Existing Uses of Water' in R.Zacklin, L. Caflisch ed., *The Legal Regime of International Rivers and Lakes*, London : Martinus Nijhoff, 1981, pp. 309 et seq.

therefore also be inferred that India may be required to pay appropriate compensation to Bangladesh at least for the past actual physical economic loss.

Conclusion

A riparian state is lawfully free to undertake or carry on any activities in an international river within its territory if its doing so causes no or perhaps only a minor harm to a co-riparian state or states. Slight inconveniences may not be accountable presumably due to close and inter-dependent relationship among the co-riparian states in the exploitation of their common river. The moment when the injury inflicted on a co-riparian state or states by a work is serious, it becomes a matter of international concern to be settled in accordance with international law and practice. The principle to this order and one which is amply recognised in international law is that a riparian state cannot use the water of an international river in a way as it thinks essential in its territory, regardless of its effects on the territory of a co-riparian state or states. And any such effects that cause material damage on the territory of a co-riparian state or states is unlawful.

India may lawfully be free to divert any amount of the Ganges dry season flow at Farakka as it deems necessary as long as it results in no substantial injury to Bangladesh. But the withdrawal of the Ganges dry season flow at Farakka, as seen earlier, has altered the Ganges river condition in Bangladesh to the grave detriment of its economy, ecology and environment. Hence, the operation of the Farakka barrage because of its serious damaging effects on Bangladesh appears to be inconsistent with and repugnant to the existing principle and practice of customary international law governing the utilisation of common waters. This being the legal position of the operation of the Farakka barrage, India may be held responsible for the violation of international law as well as for the extra-territorial damages caused by the Farakka barrage on the territory of Bangladesh.