Chapter-IV

GANGA RIVER BASIN

Mutual Distrust, Political Conflicts and New Vistas

The Ganga or Gangetic river basin encompassing through the famous Gangetic Plains is the cradle of ancient Indian civilization. The area has been the abode of legendary great Indian sages and has been instrumental in producing the great epics like Ramayana. Most of the sacred places of Hinduism are situated on the banks of Ganga River. Originating from Gangotri the river flows through the northern Indian plains touching the places, which have been, and in fact are cultural and religious centers of great Indian heritage. It is not simply a body of water for the millions of natives; it is so sacred to bring them salvation. No river system on earth is so closely connected to social, cultural and religious life in such a vast scale, as the Ganga. In this part of the present study, however, we take up this river system for management of its waters for optimal utilization by India, Nepal and Bangladesh. The Ganga makes these countries mutually interdependent holding the geopolitical key in their bilateral and multilateral relationships.1

Ganga carries sufficient rather abundant water during the Monsoon, when the requirement of water in three sharing countries is much less. The water during this time can be utilized in various hydroelectric projects and controlling floods but the lack of proper coordination, paucity of funds and mutual misunderstandings have so far not allowed it to happen.2

The quantum of water is so unmanageable during the Monsoon that Nepal experiences floods almost every year in the Terai region. India, also, is severely hit by the floods in Uttar Pradesh and Bihar devastating the life and property in these densely populated provinces. Millions of rupees are pumped every year by fund starved Union Government of India every now and then. The irony is that the measures taken as such are totally ad hoc and temporary which address only the symptoms not the disease. Certain Dhussi Bunds or
concrete fencing have been made in parts of Bihar which remain insufficient before the fury of Ganga waters during the peak season.\textsuperscript{3}

Another dimension to this grave situation is that no permanent solution to recurring floods can be arrived at without an equal concern and commitment of Nepal. The cooperation between the two and proper appreciation of each others problems can not only check the danger of floods but can become instrumental in building multipurpose projects which will help generation of power and play catalyst in industrialization and meeting the domestic, urban and rural demands of India and Nepal.\textsuperscript{4} During the peak season, when rainy waters gush into the Ganga, to make it dangerous. Proper mechanism has not been developed unilaterally or bilaterally to utilize these waters.

The situation in Bangladesh viz. a viz. Ganga is equally horrendous. This country having more than 300 rivers, rivulets and tributaries of different sizes and shapes continuously flood the country overwhelmingly washing away whatever infrastructure it manages to develop out of almost nonexistent resources. Bangladesh economy being basket case can be given some reprieve if the ebb and flow of Ganga is properly managed on multilateral terms among the three basin sharing countries.\textsuperscript{5}

The management of Ganga basin waters deserves all the more attention during the lean season. The complex geopolitics of Ganga waters compounded by mutual distrust, alleged political preponderance and sheer refusal on the part of one or the other country to realize the importance of cooperation, has harmed the national interest of the each. It may be appropriate here to point out that politics of sharing, managing or utilization of these waters actually begins during the lean season. The abundance of water leads to floods. It is easily termed as natural disaster or God-sent calamity. The politics of denial of water when it is absolutely scarce or meager leads to man-created disaster of even vaster scale. The scarcity of water witnessed every year created by man and nature is further aggravated by egoistic national governments harping on
the false sense of national interest but resulting in the suffering of millions of people and inflicting damage to their own economies.6

The Ganga River System flows through India, Nepal and Bangladesh and has a very variable flow pattern. The drainage area of the river Ganga in India is 8,61,404 sq. Kms, in Bangladesh it is 9000 sq. Kms, about half the total area of the country and almost the entire area of Nepal (120,000 sq. Km) lies within its drainage system.7 The peak discharge at Hardinge Bridge in Bangladesh is about 2.5 million cusecs where as the minimum, which occurred in 1976, is only 23,299 cusecs i.e. (less than 1% of peak discharge) (see Figure 4.1). The historical average low flow is about 65,000 cusecs at Hardinge Bridge. This extremely variable flow pattern of the Ganga River results in a major challenge in management of its waters. The total annual flow of the Ganga (along with existing diversions upstream) is about 372 M.A.F. (million acre feet). It was estimated that by the year 2000, the water requirements of Bangladesh from the Ganga River in dry season (November to May), have been estimated to be 42 M.A.F.8 During the same period, requirements of India are 150 M.A.F., and for Nepal the requirement in dry season to be estimated at 30 M.A.F. While about 56 M.A.F. is available during the dry season, which is less than 15% of the total. Therefore, the stream flow available for irrigation during the period November to May in the Ganga basin is only about 25% of the total 222 M.A.F. required in three countries (see Table 4.1). Moreover, a large increase in the sediment influx from the Ganga due to recent deforestation and large-scale soil erosion in the Himalayas result in considerable uncertainty in the prediction of reservoir life of river impoundment.9

The Ganga being a network of its various tributaries is a river system spreading its tentacles in a large tract of geographical area and it becomes necessary to closely look at its tributaries, which actually give life to the main river (see Figure 4.2).
Figure 4.1. Monthly mean flows of Ganga River at its tail end.
Source: Mahesh C. Chaturvedi and Peter Rogers (ed.) Water Resources Systems Planning – some case studies of India.p.79.

Table 4.1
Ganga Flow and Requirements
(Estimated for Year 2000)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Item</th>
<th>Quantity (MAF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Annual Flow</td>
<td>372</td>
</tr>
<tr>
<td>2</td>
<td>Requirements:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>India</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>Bangladesh</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Nepal</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>222</td>
</tr>
<tr>
<td>3</td>
<td>Dry Season Availability</td>
<td>56</td>
</tr>
</tbody>
</table>

Figure 4.2: The Ganga River Basin
Figure 4.3: Flow diagram of the Ganga
MAJOR TRIBUTARIES OF GANGA

(A) Northern Tributaries

Ramganga

The river rises at an altitude of 3,110 meter in the Garhwal district and emerges from the hills into the plains at Kalagarh, the boundary of the district. It is at this place that Ramganga dam is under construction. After traversing through some more districts, it joins the Ganga at Kanuj. Its total length is 596 Km. The basin covers an area of 32,493 sq. Km. A number of sub tributaries important being the Khiih, Gangan, the Aril, the Kosi, and the Deoha (Gorra) which join the river mostly from the east.10 The average annual flow of Ramganga is estimated at 15620 million cu. m. (see Figure 4.3)

Gomti

Gomti rises about 3 Km east of Pilibhit town of U.P. at an elevation of 200 meters. The length of the river is 940 Km and it drains the area between the Ramganga and Ghaghra systems. Some sub tributaries like Gachai, the Sai, Jomkai and the Barna, the Chuha and the Sarayu feed the river. Lucknow town is located on the banks of the Gomti. The Sai is its most important sub tributary and has a drainage area of a little over a third of the Gomti.11 Average annual flow of water in Gomti is about 7390 million cu. m. (see Figure-4.3)

Ghaghra

Called as Manchu and Karnali in Nepal, Ghaghra has its source near Lake Mansarovar. Having a length of 1080 Km., its total catchment area is 127,950 sq. Km. Its important sub tributary is the Sarda or Chauka forms the boundary between India and Nepal. The other famous sub tributary in India in India is Sarju, having the ancient town of Ayodhya on its banks. It spills out to the width of 16 Km causing floods every year in the Azamgarh and Ballia districts. Other sub tributaries of Ghaghra are the Rapti and Little Gandak. The Rapti rises in Nepal at an elevation of 3,600 meter traversing through Nepal it
descends to the plains at the boundary of India and Nepal. Being a shallow in depth it causes heavy flooding during Monsoon. The Little Gandak also originates from Nepal as an old channel of the Gandak at an elevation of 300 meter to join the Ghaghra at Shahjahanpur and carries little discharge except in the Monsoon. The Ghaghra joins the Ganga a few Kilometres down stream of Chapra town in Bihar. Being an important tributary of Ganga its average annual flow is recorded at 94,400 million cu. m. (see Figure 4.3)

**Gandak**

Known as the Kali in Nepal, Gandak emerges at a height of 7,620 meter near Tibet Nepal border overlooking the Dhaulagiri peak. It has drainage area of 46,300 sq. Km. In Nepal there are a number of sub tributaries like the Mayangadi, the Bari and the Trisuli, which join it. The Gandak debouches into plains at Tribeni in Bihar. At this site, a barrage has been constructed and canals take off on either side to irrigate 1.5 million ha in India and Nepal. The Gandak flows for another 300 Km before joining the Ganga near Patna. Its average annual flow is 52,200 million cu. m. (see Figure 4.3)

**Burhi Gandak**

Called as the Sikrahana in its upper reaches, this river rises in Champran district of Bihar at an elevation of 300 meter. About 320 Km in length it drains an area of 10,150 sq. Km. It joins the Ganga opposite Monghyr town. Its average annual flow is 7,100 million cu. m. (see Figure 4.3)

**Bagmati**

Rising in the Shivapuri Hills of Nepal at an elevation of 1,500 meter. Bagmati cuts across the Mahabharata range of hills and enters India in Muzaffarpur in Bihar. Its drainage area is 13,400 sq. Km. On the banks of this river is the famous temple of Pasupatinath in Nepal. The waters of Bagmati have a high fertility value as they carry nutritious silt. It joins the Kosi River in the lower reaches and joins Ganga.
Kamla

Rising at an elevation of 1,200 meters in Nepal, Kamla has a number of little known sub tributaries. It enters India near Jaynagar in Darbhanga in Bihar and joins Kosi. It has occupied the course of the river Balan. Its average annual flow is 7,100 million cu. m. (see Figure 4.3)

Kosi

Kosi is result of the confluence of three rivers, the Sun Kosi, the Arun Kosi and the Tamur Kosi all rising in Nepal. Of the total drainage area of the river is 74,500 sq. Km. Of the total water the Sun Kosi contributes 44%, the Arun Kosi 37% and the Tamur Kosi 19%. The Tamur Kosi has the steepest slopes. Mount Everest and Mount Kanchenjunga lie in the catchment area of the Arun Kosi.

After the confluence, the river flows through a narrow gorge for 10 Km and enters the plains at Chatra. After traversing a further 25 Km, it enters India near Hanumannagar. It forms the boundary between India and Nepal for a distance of 20 Km. A large barrage has been constructed at Hanumannagar from which two canals take off on either side to irrigate nearly a million ha in Nepal and India. The barrage is intended to prevent the river from moving sideways. The Kosi has been causing a lot of destruction by lateral movements. As its waters carry heavy silt load and the river has a steep gradient, there is a tendency for it move sideways. Thus in about 200 years the river has moved laterally 112 Km from Purnea to its present position. The Kosi project was undertaken in 1954 to prevent the lateral shift. Confining the river to the barrage width at Hanumannagar did this. The embankments have been constructed five to sixteen Km apart to serve as silt basins. After running for 320 km below Chatra, the Kosi joins the Ganga near Kursela. Its average annual flow is 61,560 million cu. m. (see Figure 4.3)

Mahananda

The Mahananda originates in Darjeeling hills at an elevation of 2,100
The Kankai is an erratic stream, which rises in Nepal Hills; it carries a lot of silt. The total drainage area of Mahananda is 20,600 sq. km. The river forms a boundary between India and Bangladesh in the last reaches before it enters Bangladesh to join the Ganga at Godagiri.  

**Table 4.2**

<table>
<thead>
<tr>
<th>Dam</th>
<th>River</th>
<th>Country</th>
<th>Installed Capacity (MW)</th>
<th>Primary Purpose</th>
<th>Completion Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chandil</td>
<td>Subarnarekha</td>
<td>India</td>
<td>---</td>
<td>Multi-purpose</td>
<td>---</td>
</tr>
<tr>
<td>(Subarnarekha)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Damodar Valley Project</td>
<td>Damodar</td>
<td>India</td>
<td>---</td>
<td>Multi-purpose</td>
<td>1959</td>
</tr>
<tr>
<td>Gandhi Sagar</td>
<td>Chambal</td>
<td>India</td>
<td>270</td>
<td>Multi-purpose</td>
<td>1957</td>
</tr>
<tr>
<td>Rajghat</td>
<td>Betwa</td>
<td>India</td>
<td>---</td>
<td>Irrigation</td>
<td>1980</td>
</tr>
<tr>
<td>Rihand (Singrauli)</td>
<td>Rihand</td>
<td>India</td>
<td>300</td>
<td>Multi-purpose</td>
<td>1962</td>
</tr>
<tr>
<td>Kulekhani</td>
<td>Kulekhanir</td>
<td>Nepal</td>
<td>92</td>
<td>Irrigation</td>
<td>1982</td>
</tr>
<tr>
<td>Marsayangdi</td>
<td>Marsayangdi</td>
<td>Nepal</td>
<td>69</td>
<td>Irrigation</td>
<td>1989</td>
</tr>
</tbody>
</table>


**(B) Southern Tributaries**

While most northern tributaries of the Ganga originate from upper and lower Himalayas, they run down through Nepal enter India to join the Ganga. Thus bonding India and Nepal. This bondage is not only ancient and geographical but also involves them to share the water of these rivers. However, most of the southern tributaries originate from within India and do not involve any other country making them internal. Nevertheless, these tributaries are equally significant to provide the Ganga its flow. These tributaries include:

**Yamuna**

Joining on the right bank Yamuna is the most important tributary of Ganga. The Chambal, and four other important sub tributaries are the Hindon,
the Sarda, the Betwa and the Ken. Yamuna rises from Yamuntori Glacier in Tehri Garhwal at quite high elevation of 6,330 meter. Innumerable streams, of them important being the Rishiganga, the Uma and the Hanuman Ganga join it in the mountains. Yamuna becomes a big river in itself after receiving waters from the Tons; the longest sub tributary of Yamuna rises at an elevation of 3,900 m and joins Yamuna below Kalsi. At this site, the Tons River carries twice the water that is carried in the Yamuna. The Giri River rises in the Shimla hills and joins Yamuna near Paonta in Himachal Pradesh.20

The Yamuna emerges from the hills near Tajewala where the water is taken off by the western and eastern Yamuna canals. It flows further 280 Km down to Okhla in Delhi from where the Agra Canal takes off. On its course further from Delhi at down is located the holy place of Mathura and 50 Km down stream lies the famous city of Agra. It flows in the southeasterly direction till it reaches Allahabad. Small tributaries like, the Karan, the Sagar and the Rind join it on its left bank and the Chamba, the Sindh, the Betwa and Ken flowing from the Vindhayas join it on its right bank. The total length of the Yamuna from its origin to Allahabad is 1,376 Km. At the confluence in Allahabad it brings in an average annual water flow of 93,020 million cu. m. It may be interesting to point out here that Ganga average annual flow at this confluence is about 52,950 million cu.m. (see Figure 4.3). While Ganga is highly dependent for its waters on Yamuna, the Yamuna itself is dependent on aforesaid sub tributaries. It will not be out of place to mention these sub tributaries separately as they are quite significant for their length and contribution.21

(i) Chambal

Rising in Vindhaya ranges the Chambal flows for 965 Km before it joins the Yamuna. It flows through the flat fertile Malwa Plateau and then enters a gorge at Chaurasingarh. The gorge is 96 Km and stretches up to Kotah city. The river runs for another 34 Km flowing through plains. The total drop between the source and outfall is 766 m and of this drop 128 Km is in the
gorge itself. Taking advantage of this, three dams have been constructed at Gandhi Sagar, Rana Pratap Sagar and Jawahar Sagar, where 386 MW power is generated. As river flows much below the banks and due to poor rainfall, severe erosion has occurred over the centuries and numerous deep ravines have been formed in Chambal Valley.

(ii) Sind

From the Vidisha district of Madhya Pradesh rises the river Sindh at a not very high elevation of 543 meter. Draining an area of about 25,085 sq. Km, this river is joined by many ravines of which Parvati, Kunwari and Pahuj are notable. The Sind has a total length of 415 Km before it joins the Yamuna.

(iii) Betwa

Source of this river is in the district of Bhopal in Madhya Pradesh at an elevation of 470 m. It joins the Yamuna near Hamirpur after flowing 590 Km. The total catchment area of the basin is 45,580 sq. Km. The Dhasan is one of its important sub tributary. Its average annual flow is 10,000 million cu.m. (see Figure 4.3)

(iv) Ken

It emerges from the hills of Satna district of Madhya Pradesh. It is 360 Km long up to its point of confluence with the Yamuna near Chilla. It drains an area of 28,224 sq. Km. Its average annual flow is 11,300 million cu. m. (see Figure 4.3)

Apart from the above-mentioned rivers the Yamuna basin there are number of smaller rivers like the Chautang, the Sahibi, the Dohan, the Kantli, the Bapah and the Banganga, which are lost in the sandy tracts.

Tons

It rises at an elevation of 610 m in a tank at Tamakund in the Kaimur
range of hills and flows through the fertile lands of Rewa and Satna districts of Madhya Pradesh. The river is joined by the Belan in U.P. and itself merges into Ganga about 311 Km downstream of the confluence of the Ganga and Yamuna. The total length of the river is 264 Km. Its average annual flow is 5.910 million cu. m. (see Figure 4.3)

**Karamnasa**

It emerges from Kaimur range in Mirzapur district at an elevation of 350 m. It joins the Ganga at Chanusa. Its sub tributaries include the Durgavati, the Chandraprabha, the Karuniti, the Nadi, the Khajuri and other small rivers rising in Mirzapur and Allahabad districts, with lengths of about 50 Km and joins the Ganga within the same districts. The drainage area of the Karamnasa and other small streams is 11,709 sq. Km.

**Son**

Originating from Sonabhadra, in Madhya Pradesh, at an elevation of 600 m., the Son passes in cascades over the hills reaches. It receives the Rihand tributary across which the Rihand dam of 300 MW was constructed in 1963 (see Table 4.2). Other sub tributaries joining it here include the Kanhar and the Ghagar. After passing through the Palamau district of Bihar where it receives the north Koel. The Son joins the Ganga about 16 Km upstream of Dinapur in Patna district. The total length of the river is 784 Km. A weir constructed at Dehri in 1869-79 provides irrigation for 0.35 million ha. As the weir became old, a new barrage was constructed nearly a century later, 10 Km upstream. The important sub tributaries of the Son together with their catchments in sq. Km shown in brackets are the Mahanadi (3,507), the Gopat (5,9980), the Rihand (17,110), the Kankar (5,903), the North Koel (10,360). Below the Son, on the right side of the Ganga, there are a large number of sub tributaries. Of these Punpun and the Kiul are the large ones.

**Punpun**

In Chota Nagpur Plateau originates the Punpun to join the Ganga about
25 Km east of Patna. The Butane, the Madar and the Morhar are its sub tributaries. About 200 Km its drainage area is 8,530 sq. Km. It often causes floods and damages on the eastern side of Patna city. Its average annual flow is 3,577 million cu.m. (see Figure 4.3)

**Kiul**

Kiul also rises in the Chota Nagpur Plateau and joins the Ganga near Swaggarha. It flows for 111 Km draining an area of 16,580 sq. Km. Its sub tributaries are the Harhar, the Barnar, the Azan and the Ulan.

The Ganga enters Bangladesh; some of its waters are diverted downstream which are known as Bhagirathi-Hooghly River. The Bhagirathi-Hooghly falls in Indian territory and is joined by some important tributaries. In fact the Bhagirathi-Hooghly course of Ganga is also called its original course. The tributaries joining it here include:

(i) **Dwarka**

The Dwarka, rises in the Birbhum hills and joins the Bhagirathi in Mushirdabad district. One of its important tributaries is the Mayurakashi on which dam was built for providing irrigation in West Bengal and Bihar. This river has a length of 134 Km and has a drainage area of 8,850 Km.

(ii) **Ajoy**

Its source is in the Santhal Pargana hills and joins the Bhagirathi near Katwa. Its length is 276 Km and it drains 6,050 sq. Km. Its average annual flow is 3,207 million cu m (see Figure 4.3)

(iii) **Damodar**

Originating in the southeast of the Palamau district Damodar flows for 541 Km and has a catchment area of 25,820 sq. Km. After flowing through Bankura and Burdwan districts, it joins the Hooghly near Fulta point. The Damodar passes through important industrial and mining areas of India.
river had been causing floods frequently, and a comprehensive plan of flood control was undertaken. Four dams were constructed and a barrage at Durgapur from which canal takes off for irrigation of nearly 0.4 million ha. Average annual flow of Damodar is 12,210 million cu. m (see Figure 4.3)

(iv) Rupnarayan

Its source lies in the Tilabi Hills of Bihar and after passing 254 km, joins the Hooghly near Nurpur, downstream the confluence of the Damodar. Tidal for its entire course, it has a catchment area of 8,530 sq. Km. Its average annual flow is 4,400 million cu. m (see Figure 4.3)

(v) Haldi

It joins the Hooghly below its confluence with Rupnarayan. It has a catchment area of 10,210 sq. Km and average annual flow of 5,300 million cu. m (see Figure 4.3)

The total catchment area of the northern tributaries of the Ganga is approximately 420,000 sq. Km. The drainage area of the southern tributaries is 580,000 sq. Km. The drainage area of the tributaries joining the Bhagirathi-Hooghly is 60,000 sq. Km. Due to heavier intensity of rainfall, the annual run off from the region north of Ganga is 0.75 m while that from the south is 0.3 m. This shows the importance of the contribution of the flows from the Himalayan plains north of the Ganga to the main river. Nearly 60% of the water flowing in the Ganga comes from the drainage areas north of the river.

Deltas

The Ganga, as well as its tributaries and sub tributaries, is constantly vulnerable to changes in its course in the delta region. Such changes have occurred in comparatively recent times, especially since 1750. In 1785, the Brahmaputra flowed past the city of Mymensingh, it now flows more than 60 Km west of it before joining the Ganga.

The deltas, the seaward prolongation of silt deposits from the Ganga
and Brahmaputra river valleys, cover an area of about 56,980 square Kms and is composed of repeated alternations of clays, sands and marls, with recurring layers of peat, lignite and beds of what were once forests. The new deposits of the delta, known in Hindi and Urdu as the Khadar, naturally occur in the vicinity of the present channels.

The southern surface of the Ganga Delta has been formed by the rapid and comparatively recent deposition of enormous loads of silt. To the east, the seaward side of the delta is being changed at rapid rate by the formation of new lands, known as Chars, and new islands. So much silt is deposited here that the 100 fathom line lies much farther out to sea than it does, for example, off the mouth of the Indus in the Arabian Sea. The western coastline of the delta has, however, remained practically unchanged since the 18th century.

The rivers in the West Bengal area, being sluggish, have been described as dead or dying, little water passes down them to the sea. In Bangladesh delta region, the rivers are broad and active, carrying plentiful water, they are connected by innumerable creeks. During the rains, from June to October, the greater part of the region is flooded to a depth of several feet, leaving the villages and homesteads, which are built on artificially raised land, isolated above the flood waters. Communication between settlements during this season can be accomplished only by boat. To the seaward side of the delta as a whole there is a vast stretch of tidal forests and swamp-land. The forests are called Sunderbans (Sanskrit meaning “beautiful forest”) they are protected by India and Bangladesh. For conservation purposes, no permanent settlement is permitted there.

**Ganga- The Heartland Of India**

This river basin is interwoven with the life of the people of India. The Ganga plains are called the heartland of the country as it has cradled the great and ancient Indian civilization. In the third century B.C., the ancient empire of Ashoka was situated on the banks of Ganga with its capital at Patliputra (now called Patna), similarly Kannauj on the banks Ganga as the capital of empire
of Harsha. This empire controlled a greater part of northern India in the mid-7th century. Most of the empires built in Medieval India had their origin and fall on the banks of Ganga. The great Mughal Empire was centered on Delhi and Agra that was spread across the Ganga plains and extended up to Bengal. Dhaka and Mushirdabad in its delta region have been centers of Muslim power.46

The commercial, political and geographic importance of this area can be assessed by the fact that the British, on entering India, concentrated most in this area. After gaining strength, the British East India Company first captured Bengal and fought the famous Battle of Plassy for it. They gradually advanced almost along the Ganga upstream reaching and finally capturing Delhi in mid-19 century.47

The Ganga basin has also the great religious-historical cities and the heavily populated ones. All the three countries that share the waters of this basin have their important industrial centers based in this region as indicated in the Table 4.3.

As shown in the Table 4.3 the Ganga has a massive drainage area in India, Nepal and Bangladesh. Naturally, the agriculture in its catchment area is entirely dependent on its waters. To utilize these waters some irrigation and multipurpose hydroelectric projects have built by the basin sharing countries as shown in Figure 4.5. The area being densely populated with having most of Indian mineral resources in its belt needs electricity for domestic and industrial use and needs water for irrigation of vast tracts of land.48

It may also be mentioned that Ganga had provided a very useful commercial waterways for navigation from ancient times. From Calcutta to Agra both up and down the people of the area navigated on its waters for transport and trade. However, the increased withdrawal of water for agriculture and domestic use, development of alternate needs of transport especially construction of railways decreased the navigation to reduce it to bare minimum.49
**Table 4.3**

**Ganga Basin: Major Cities, Industrial Centers and Drainage Area**

<table>
<thead>
<tr>
<th>Major Cities</th>
<th>Population in 000 (1991 Census)</th>
<th>Industrial Centers</th>
<th>Drainage Area of Country in the basin (Square Kms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meerut</td>
<td>850</td>
<td>Asansol, Jamshedpur, Durgapur, Rourkela, Calcutta</td>
<td>861,404</td>
</tr>
<tr>
<td>Agra</td>
<td>892</td>
<td></td>
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<tr>
<td>Aligarh</td>
<td>481</td>
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<tr>
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<tr>
<td>Bareily</td>
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<td>Varanasi</td>
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<tr>
<td>Calcutta or Kolkata</td>
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**BANGLADESH**

<table>
<thead>
<tr>
<th>City</th>
<th>Population in 000</th>
<th>Industrial Centers</th>
<th>Drainage Area in the basin (Square Kms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rajshahi</td>
<td>299</td>
<td>Dhaka</td>
<td>9,000</td>
</tr>
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<td>3,397</td>
<td>Narayangang, Khulna</td>
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<td>Dhaka</td>
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**NEPAL**

<table>
<thead>
<tr>
<th>City</th>
<th>Population in 000</th>
<th>Drainage Area in the basin (Square Kms)</th>
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<td>Kathmandu</td>
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MUTUAL DISTRUST AND POLITICAL CONFLICTS OVER SHARING OF GANGA BETWEEN INDIA AND BANGLADESH

In the relationship between India and Bangladesh, the Ganga waters are an important component, perhaps the most important one. Any attempt to improve and strengthen the relationship between the two countries must face this controversial issue squarely.

A simplified version of the Bangladesh that India is an upstream country and has been unilaterally diverts the waters of Ganga to the disadvantage of Bangladesh. Bangladesh felt that diversions of water during the lean season would desertify that part of Bangladesh that falls within the Ganga basin, accounting for a third of the country’s territory and population. The diversions, Bangladesh claims affect it in many ways. Bangladesh raised the issue in the 31st Session of the U.N. General Assembly, where it argued that the unilateral diversion of waters of Ganga by India was not only a violation of all the rules and regulations pertaining to the sharing of the waters of international rivers, but also involved security, economic and humanitarian issues. The leader of Bangladesh delegation, M.H. Khan said:

"As one of the least developed countries, Bangladesh was struggling in its attempts at national reconstruction and rehabilitation. The additional burden on the economy imposed as a result of unilateral action of our neighbour may seriously jeopardize our efforts at self-reliance as it is far beyond our capacity to sustain environmentally and ecologically the impact of diversions of waters is devastating, affecting soil conservancy, erosion, salinity, conservation of fauna and flora and wild life."

Bangladesh also feels that India, larger and more powerful, disregards the legitimate interests of a smaller and weaker neighbour. The bureaucrats, technocrats, officials and non-officials, intellectual, and the general public have supported this widely prevalent view in Bangladesh cutting across party lines. There is a national sense (may be unfounded) of grievance on this issue. The sense of actual or imaginary loss at the hands of India could be felt at all levels and spots. Bangladesh is an upcoming democratic polity. Innumerable small political outfits further constitute two dominant political formations. Surprisingly enough, every political group of any significance invariably feels that India is not doing justice with Bangladesh in sharing the
Bangladeshi nationalism heavily depends upon which political party or group outclasses the other to accuse India for country’s water related problems. No political establishment can afford to be soft on India on this account. Thus one finds that whether it is floods (during Monsoon) or droughts (during lean season) India is the target.

However, Indian perception of the issue is entirely different. Among those who have been dealing with this matter at governmental level, a common view is that Bangladesh is extremely rigid and unreasonable on this issue. India feels that Bangladesh has greatly over pitched its water needs and has never used more than a small fraction of the waters that have been flowing through it and also exaggerates the adverse effects of reduced flows. India also perceives that Bangladesh insists on “historic flows” and virtually seeks to impose a veto on upstream uses; and it has blown the dispute up into a big political issue in domestic politics, making inter-governmental negotiations difficult. A further complication in the Indian case is that it has a federal structure; at the level of the state governments there is a feeling that in its negotiations with Bangladesh, the government of India fails to pay adequate attention to the interests of the states and is generous to Bangladesh at their cost. To some extent this, perception is important in state level politics, though the issue is not as important politically in India as it is in Bangladesh.

This over simplified national interest weighs great in the bureaucracy and political processes in India and Bangladesh. This is why it is important to take note of it. It is also good for each side to see the problem in the light of the opposite view in its extreme form.

India tends unconsciously to regard the Ganga as a national river—a river that is short of water in terms of cultivable area and the population served by it. India reckons Ganga as a part of the water resources available to the country from which to meet the water needs of the arid areas in the western part of the basin and beyond, and perhaps even in the southern parts of the
country. In this national perspective there is little room for a serious consideration of Bangladeshi requirements. There is inadequate appreciation of the ill effects of Bangladesh because of the reduced flow of Ganga. Both India and Bangladesh seem to be shortsighted on this account. Bangladesh tends to regard the continuance of historic flows as a birthright and has failed to recognize the needs of upstream populations. It also has refused to even consider other possibilities of meeting water needs of its own people for fear of compromising its claim over Ganga waters. Bangladesh forgets that there is a problem, which implies two sides.

Both India and Bangladesh have stuck to their conflicting positions that is neither in the interest of both nor the entire region. It thus becomes incumbent upon them to develop a proper understanding of the nature of the issue. Unfortunately, the protracted inter-governmental negotiations on Ganga waters have been partly misdirected because of politics and distrust of Farakka and the idea of flow augmentation, which have tended to distract attention from the central problem of water sharing during the lean season.

**Farakka**

The primary purpose of the construction of Farakka barrage was to divert a part of the waters of the Ganga to its Bhagirathi-Hooghly section to arrest the deterioration of Calcutta Port. The other important purpose was to protect Calcutta’s drinking and industrial water supplies from the incursion of seawater salinity. The construction of a diversion barrage across the Ganga was in the minds of experts and policy makers for a long time.

In 1853, a committee headed by Sir Arthur Cotton, an expert of international repute, conducted a survey regarding siltation in the Ganga at its mouth. Subsequently, from 1853 to 1930 certain other expert committees also looked into this problem. Invariably all these committees recommended that the improvement in the flow of water for multiple reasons could be achieved only if barrage is constructed to regulate the flow of water.

The waters of the Bay of Bengal used to enter the Ganga delta at
Hooghly due to low flow in the river. This tidal inflow of water brought salinity leaving the river water useless for drinking and irrigation. In 1953, German specialist in tidal hydraulics, Dr Walter Hensen was given the task of looking into this problem. This report in February 1957 also suggested that a barrage should be constructed at Farakka in Mushirdabad district. In his view this could be the most effective means of preventing the long term deterioration of Bhagirathi-Hooghly.\textsuperscript{61}

In 1961, India started the construction of the Farakka Barrage 400 Km upstream from Calcutta, at the head of delta just inside the Indian territory. The construction itself became a bone of contention between India and Pakistan (Bangladesh then being called as East Pakistan). India contended that the port of Calcutta was deteriorating due to deposits of silt and the intrusion of saline seawater. It was constructing the Barrage to divert the quantities of fresh water from the Ganga towards Calcutta Port. By this project the water was to be carried out by means of large canal into the Bhagirathi River, which joins the Hooghly River, on the banks of which stands Calcutta.\textsuperscript{62}

India responded to the Pakistani concern\textsuperscript{63} by taking a stand that it was entitled to the Ganga waters for its benefit. However India was ready to chalk out the modalities regarding the quantum of flow with Pakistan. Pakistan insisted that all the riparian countries should exercise joint control over the waters of international rivers for the sake of mutual prosperity. It maintained that the Ganga waters are also vital to irrigation, navigation and to the prevention of saline incursions in the East Pakistan. Further that the Farakka barrage would deprive them of a valuable source of water.

During 1957 and 1958 Pakistan also suggested seeking advisory and technical services of a United Nations body.\textsuperscript{64} And that the proposed projects of both the countries should be jointly examined by common experts. However, India did not agree to such proposals.

Meanwhile the talks between India and Pakistan went on intermittently between 1960 and 1962.\textsuperscript{65} Pakistan felt so much concerned about Farakka that

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it raised the issue during the Tashkant meeting between Indian Prime Minister and Pakistan’s President in the aftermath of 1965 war. Both the countries talked the Farakka issue many a times till 1971.66

A watershed came in 1971 while East Pakistan became sovereign, independent country with the name of Bangladesh.67 However, the problem of sharing the Ganga waters got further aggravated. Bangladesh cried of water scarcity during the dry season. As the country was indebted to Indian help for its very creation, the relations between the two were cordial at the political level. Both India and Bangladesh agreed in principal to cooperate in the field of flood control, irrigation and power development in the Ganga basin. Sheikh Mujibur Rahman the architect of Bangladesh was friendly with India. During this honeymoon however the issue could not be resolved.68 The untimely assassination of Mujibur Rahman in 1975 and the establishment of military government in Bangladesh changed the entire scenario.

The cosmetic touches to the problem of sharing the waters are evident when in March 1972; Indian Prime Minister Mrs. Indira Gandhi visited Dhaka and agreed to establish a Joint River Commission. On her return back she emphasized on 19 March 1972, the bright prospects of harnessing the Ganga, Brahmaputra Rivers.69 Ministerial level meetings were held in April 1972 in this regard. On 24 November 1972 a Joint River Water commission was constituted to conduct comprehensive joint surveys, which could be mutually beneficial. In July 1973 both India and Bangladesh agreed to hammer out a mutually acceptable solution of sharing Ganga. Meanwhile India continued to construct the Farakka Barrage assuring Bangladesh that it will not increase flood intensity of Padma. Such overtures never found favour or appreciation from Bangladesh. Rather increased its suspicion towards India.70

The 1974 Farakka Agreement

The 1974 agreement was actually signed on 18 April 1975. It culminates from Mujibur Rahman’s India visit in May 1974. The Farakka Barrage project was nearing completion and India agreed to commission the
Barrage after resolving the sharing of dry season flow of Ganga. Under the agreement Sheikh Mujibur Rahman was ready to give flow of 11,000-16,000 cusecs to India while India required minimum 40,000 cusecs to achieve the disilting Calcutta Port which was the purpose for building up Farakka Barrage. It was purely experimental agreement with validity of merely six weeks. The issue was temporarily settled with the conclusion of the agreement between India and Bangladesh in Dakha in April 1975. On the assassination of Sheikh Mujibur Rahman within the five months of the conclusion of the agreement, the new military regime of Khondakar Mushtaque Ahmed that took over announced that his government would abide by all the international treaties concluded by the Mujib government. Contrarily however within a month it unilaterally rejected Farakka agreement and launched anti-India tirade on the Farakka issue. The issue became internationalized when Bangladesh lodged a complaint with the United Nations regarding Farakka. United States supported Bangladesh in the United Nations. Pakistan, Saudi Arabia and few other countries also supported the stand taken by Bangladesh. And Bangladesh failed to gain general support at the United Nations on the Farakka issue and the U.N. Political Committee adopted a resolution on recommending bilateral discussions to settle the dispute. General Zia-ur-Rahman also raised the issue at the Non-Aligned Conference in Colombo in August 1976. He argued, “We should not forget that 20,000 Indian soldiers had sacrificed their lives in the war to liberate Bangladesh in 1971. If Indians could shed their blood to achieve independence of Bangladesh, then same Indians would also offer this country the waters of Ganga”.

The 1977 Farakka Agreement

During 1976 India was going through a period of Emergency and new political formations were under way to challenge the alleged political high handedness of Mrs. Indira Gandhi. The opposition parties in India merged to form Janata Party, which got the massive mandate in the General elections held in March 1977. During the elections, the Janata Party had promised to settle the issues with India’s neighbours on priority basis. This along with
apprehension that the Farakka issue may not be internationalized and go out of hands, an agreement was concluded between the two countries on 5 November 1977. The Farakka agreement of 1977 seemed more viable (though interim) as it was to be valid for 5 years.

Under the Agreement, India was entitled to 20,000 cusecs and Bangladesh to 34,000 cusecs of the lean season flow in the Ganga. The agreement stipulates that if the flow at Farakka falls below the standard 57,000 cusecs in a draught year, Bangladesh will be guaranteed 80% of its normal share. The signatories however could not visualize the eventual seasonal fluctuations in the flow. As a result India's share in 1980 fell to just 10,500 cusecs, or half the level envisaged in the agreement. India felt deprived on the account of the guarantee clause as the purpose for which Farakka Barrage was built --that of desilting Calcutta Port- stood defeated. The agreement attracted considerable criticism in various Indian quarters on these accounts.

The 1977 Agreement kept pending the further efforts on ways to augment the flow at Farakka. The Joint Rivers Commission (formed in 1972) was upgraded to the ministerial level to make it more deliberative and effective. However no substantial gains accrued out of it. The hitherto bilateral issue of sharing Ganga waters was tried to make multilateral when Bangladesh attempted to include Nepal into it. While Bangladesh wanted upstream reservoirs in Nepal, India wanted to bring water across from reservoirs on the Brahmaputra. Bangladesh desired that Nepal must be made party to the talks, without technical exercises could not be conducted on the feasibility of the Nepalese reservoirs. Bangladesh also refused to discuss the Brahmaputra Plan terming that the two proposals must be treated on the same footing and this could not be achieved unless Nepal was brought in. Mrs. Gandhi who had by now again voted to power viewed it as a deliberate attempt by Bangladesh to stall the harnessing of the Brahmaputra.

India claimed to adhere to the short-term part of agreement and proposed an assessment of the impact of the agreement on the economies of
the two countries. India reiterated its concern about the Calcutta Port, which was in danger due to lack of water. It further demanded the exchange of relevant data between the two countries.\textsuperscript{83}

Short-term arrangements in the agreement notwithstanding Bangladesh emphasized on “historical usage of the Ganga flows”. Every cusec of water withdrawn from the Ganga in India was considered net loss for Bangladesh. Nevertheless, under 1977 Agreement\textsuperscript{84} Bangladesh accepted willy nilly, a quantum of water almost 43% less than the historical flows. In the leanest period the flow fell from 44,000 cusecs, implicit in the 1974 Agreement,\textsuperscript{85} to only 34,000 cusecs. On the other hand various Indian quarters felt dissatisfied with the arrangements. Especially while the flow of wares in Hooghly went down to the alarming low level of 11,000 cusecs in 1981, against the minimum required flow of 40,000 cusecs. The Congress Government, which regained power under Mrs. Gandhi’s leadership, termed the 1977 Agreement as detrimental to India’s interests.\textsuperscript{86} During the President Zia ur Rahman’s February visit to New Delhi, both countries agreed for bilateral negotiation on the contentious issue and revise 1977 Agreement\textsuperscript{87}. This followed further negotiations extending the 1977 Agreement till 1982\textsuperscript{88} and further accords in 1982 and 1985.\textsuperscript{89} Both the countries accepted that the long-term solution of the problem was the augmentation of flow of waters at Farakka during the lean season.


The vexed issue of Farakka Barrage and sharing of Ganga waters remained unresolved since the inception of Bangladesh till mid 1990s. The intermittent talks and plethora of accords or agreements addressed to the problem in passing without touching and resolving the core issues. Nevertheless these efforts show a common resolve for bilateral cooperation which is an important key to South Asian geopolitics. The common endeavors further emphasise that the countries of Continental South Asia in general and Indo-Bangladesh in particular are destined to exist together and it is incumbent
on them—bilaterally as well as multilaterally—to cooperate for the benefit of their individual multiple interests. Sooner they understand the better. The 1996 Ganga waters treaty seems one such effort.90

The treaty of sharing of the waters of Ganga was signed by the Prime minister of India H.D. Deve Gowda and his Bangladesh counterpart Sheikh Hasina on 12 December 1996.91

**Sharing of Flow**

Keeping in view that a short-term agreement would serve no useful purpose aimed at long-term agreement as desired by Bangladesh. Though India was hesitant about making a long-term commitment on the sharing its scarce water resources in the context of growing demands, it tried to reconcile the pragmatism and diplomacy. It is a 30-year treaty (renewable further), with a provision for a review at the end of five years, or even at the end of two years if either party wants it.92

The divergence over ‘augmentation’, which caused an impasse in the past, has been sidestepped. The treaty essentially addresses the sharing of the lean season flows, though briefly93 recognizing the need for cooperation in solving the long-term problem of augmentation. The sharing formula94 is related to actual flows at various levels and not to “75 per cent dependable flows” as in the past agreements.95

The basic principle is of 50:50 sharing of the lean season flow by the two countries. This applies to a range of flows, with two modifications at the upper and lower ends respectively. At the upper end, there is a slight acceleration of the increase in India’s share to enable it to reach 40,000 cusecs (the full diversion capacity of the Farakka Feeder Canal) at a flow level of 75,000 cusecs instead of 85,000 cusecs. Above 75,000 cusecs, India’s share is held at 40,000 cusecs and the rest goes to Bangladesh.96 At the lower end, the basic 50:50 sharing is subject to the provisions that in the leanest part of the lean season—from 1 March to 10 May—each side will be given a guaranteed 35,000 cusecs, with the residue going to the other side, but in alternate ten-day
period (three ten-days period in India’s favour and three in Bangladesh’s). In
the period 21-30 April when Bangladesh would have received 34,500 cusecs
under the previous agreements, they will now get 35,000 cusecs.97

One of the demands of Bangladesh had been that any long-term
understanding should provide for a guaranteed minimum flow.98 The 1996
Treaty does not specifically include a “minimum guarantee” (about the
practicability of which India had reservations); though, it included several
provisions here and there, which together provide a measure of security to
Bangladesh.99

The treaty seemed to be an effort to resolve the prolonged distrust
between the two neighbours and a desire to provide an arbitration mechanism.
The treaty provides essentially for mutual consultations and joint monitoring
of flows100 to eliminate or minimize conflicts or disputes, if any in the course
of the operation of the treaty will be resolved within the Joint Committee101
envisaged by the treaty, falling which they will be referred to the Joint Rivers
Commission102, and failing resolution at that level, the matter will be referred
to the two governments.

The 1996 treaty is a product of good will and per chance good timing
on both sides. A new government in Bangladesh in 1996, led by Sheikh
Hasina (daughter of Mujibur Rahman), who desperately needed this
diplomatic victory to consolidate her position at home. A new approach was
being followed by India too which stressed on good relations with India’s
small neighbours on a non-reciprocal basis.103 The agreement was further
made possible by the visit of West Bengal Chief Minister Jyoti Basu to
Bangladesh. The West Bengal government had always opposed any diversion
of water to Bangladesh at the cost of Calcutta port. Sheikh Hasina recognized
while in New Delhi that the Jyothi Basu’s visit to Bangladesh has helped in
the smooth and successful completion of the agreement.104

The treaty also became possible as the Congress Party and Left Front
(which was also ruling West Bengal) supported105 it. India and Bangladesh

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accepted the fact that very often there would simply not be enough water for both sides during the lean period. Thus, augmentation of water in the channels was considered as integral to any scheme of sharing waters of Ganga. West Bengal suggested the channeling the flow from the Sankosh River in Bhutan.106

The Nepalese Perspective of Ganga Waters

For Nepal the water resources provide an important national wealth. It provides facilities for Nepal’s agricultural and industrial development and can generate capital by selling surplus energy. Nepal’s perspective on Ganga is natural as the country is an important state of Ganga Basin. Most of the Nepalese rivers join Ganga at one stage or the other. Nepal is an upstream country with meager resources –its economy being one of the least developed- to carry out surveys to measure its full water potential.107

Nepal has never been a colony of a European power per say, but it is equally true that the country, handicapped by its landlockedness and its rugged terrain has not been able to register any notable economic growth. The ever-present water resource has not been even marginally tapped. The possibilities of building a commercially viable project on any Nepalese river can be either with aid from international financial institutions or with the financial/technical help from India and China.

Nepal lacks a clear water policy and being a Monarchy there had not been deliberative bodies within the country to ponder over this untapped water wealth, which has the potential to catapult the Nepalese fortunes. Thus one can see passing reference here and there on its concern on Ganga. T.P. Acharya, the former Prime Minister of Nepal, while commenting on Gandak River agreement, said in a statement on 27 July 1958 that:

"It is necessary for Nepal to work in collaboration with India for executing the Gandak project. But it is evident that Nepal will have very little benefit from this project, at the cost of giving its land to the possession of another country. I request, therefore, that the Nepal Government should think for its own benefits also."

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King Mahendra, while defending the project, said:

“We firmly believe that the proper canalization of the Gandak river flowing down from the holy Himalayan heights in Nepal will bring considerable benefit to the people and progress and the development of each of our two adjoining countries.”

King Birendra, while remarking on Karnali River high-level technical committee in February 1988, said:

“If means can be found to make proper use of the different water resources scattered from one end of the country to another, it need not take long for the country to become prosperous and affluent. This consideration has resulted in various undertakings which are now underway with encouraging results. For planned economic development my government has given priority to the programmes that seek to expand transport facility and electric power.”

In 1990, the first democratically elected Government took over in Nepal and a new realization of losses incurred due to delay in tapping the water resources crept in. The unleashing of market forces the world over and economic liberalization shut out the old taboos and brought in pragmatism.

The Nepalese Prime Minister, K.P. Bhattarai said:

“Nepal is rich in water resources and we have to utilize them professedly for tackling the vast unemployment problem and expedite the development of the country.”

On the concept of “common rivers” K.P. Bhattarai stressed:

“Many of the rivers originate in Tibet go through Nepal and flow down into India. If we call these common rivers, we do not sacrifice Nepal’s sovereignty to India…”

Since beginning Nepal has not participated in the talks on the Ganga waters between India and Bangladesh. On a visit to Nepal in 1981, Bangladesh President, Zia-ur-Rahman stated, “The Ganga is an international river. I am of the view that only such joint approach between the three countries (Bangladesh, India and Nepal) will be beneficial for the peoples of all the three countries”. In 1986, India agreed to include Nepal in the water negotiations.

India’s initial resistance to the tripartite proposal was both political and economic. Bangladesh intended to bring Nepal into tripartite agreement for
supplementing the flow of water perhaps assuming Nepal too had apprehensions about India. If Bangladesh and Nepal got together they can tackle and bargain with India more effectively. India will find it difficult to abrogate a tripartite agreement than a bilateral one.

Nepal was not happy from the joint projects like the twin Kosi barrages and felt it has not gained from the scheme originally promised. Though India had also got worse out of the Project. For a few years after the completion of the barrage food production in the surrounding Indian areas actually fell. The project, certain Nepalese quarters felt, was very badly designed, leading to water logging and heavy silt at the barrages. India proposed to solve these problems by building a storage dam upstream on the Kosi. But Nepal became increasingly suspicious of Indian proposals.

Nepal became mainly interested in building small projects, which will meet its own needs of water and power (like Devighat and Trisuli). Nepalese officials felt that large dams will submerge hundreds of thousands of acres and create settlement problems in a country that is already short of cultivable land. Big dams involve huge sums of money that was difficult for the country to arrange. Small dams Nepal expect it will earn large sums by selling water and power to India. So, the political and financial constraints forced Nepal to give up building big waterpower projects. Overwhelming trade and economic dependence on India and fears of weak bargaining position vis-à-vis India was another factor in this regard. India being a major prospective buyer of Nepalese power could always stop buying it for arm-twisting. If dams are big and huge finances are involved, the country will be hard pressed to sell the power in the buyer’s market. It will have no choice to meet the repayment demands on investments. If the projects are small the less finances will be involved and Nepalese stakes will be less.

The situation on Indo-Nepal cooperation in harnessing water resources in general and the hydropower potential, in particular, is changing since the beginning of 1990s. Energy needs and developmental pressures in the two
countries are rising. Nepal is gradually becoming serious about the opportunity costs involved in delaying such projects. The Nepali ruling parties since the democratic change of 1990 neither have anti-India political hang-ups like those of the King since 1960, nor can they afford to ignore the development agenda required to nurse their own respective political constituencies. With reforms and liberalization, there is also a significant change in India’s attitude towards the involvement of private foreign capital in the energy sector. It was in these changing circumstances that the Mahakali River treaty was signed in 1996 between India and Nepal. The then Indian Prime Minister I.K. Gujral commenting on the treaty said “The Mahakali River Treaty between Nepal and India will turn out to be an epoch making blue print for all-round economic development of Nepal, with a great deal of spill-over benefit for India”\(^{118}\)

**NEW VISTAS**

All said and done, the countries of South Asian continent given to their domestic disparities that result into their compulsions and overall regional environment have not created an atmosphere of cooperation. The Continent got rid of the European powers (British) in 1947/48, still the people and their leaderships invariably accuse them of their past and present ills. The countries thus far have failed to arrive at a single mutually acceptable solution to any of their individual or common problem, be it boundaries, trade and commerce or water. It has been mentioned earlier too that most of these countries do not have stable societies or politics that reflect on their power of effective decision-making. The three Ganga River Basin states –India, Bangladesh and Nepal- are no exception in this regard.

The preceding pages in this part of study has shown that the countries lack quick decision making which has hampered cooperation and brought unbearable loses to all the countries of the Basin. Sheer lack of appropriate planning or perverted priorities may also be responsible for the delay.

Not that these countries lack potential or there is dearth of ideas. They...
have future planning to improve the management of their water in different ways for their development.

Nepal has a vision for the future management of its waters by building; small-scale projects to benefit the rural masses; medium-sized projects to meet energy and water supply needs; large-scale projects for future national requirements. Nepal intends to expand the irrigation facilities and provide drinking water. The Nepalese governments have repeatedly declared they want bilateral and multilateral cooperation.\textsuperscript{119}

Bangladesh also wants to meet its domestic and industrial water needs on priority. It foresees to maintain water quality in critical areas; maintain effective water transportation; expand inland and coastal fisheries; provide water for agriculture which can bring grain self-sufficiency; control the flooding and improve drainage facilities throughout the country; and management of salinity and sedimentation of its rivers.\textsuperscript{120}

The country being a Ganga Basin state cannot solve its water related issues singly. Bangladesh feels there is need of international cooperation among Nepal, India and Bangladesh and specific areas of cooperation being forecasting, sharing of transboundary waters etc.\textsuperscript{121}

India is also looking forward for various plans to open up new avenues for water management. It is considering to take the one-mile wide 1,00,000 cusecs Brahmaputra canal from Assam to West Bengal entirely through Indian territory via the Silliguri neck. A sprawling 30 M.A.F.(million acre feet) reservoir could be built for this purpose on the Brahmaputra at Dihang in the Himalayas on the northeastern tip of the country.\textsuperscript{122}

Similarly the Pancheswar dam on the Sarda on the Indo-Nepal border could be built entirely within the Indian territories in the Kumaon hills. India is also seeking Nepal's cooperation to construct 13 major dams which would store around 50 M.A.F. of water and generate 20,000 MW power, the largest dam being proposed is on Kosi with 15 M.A.F. of water at its back.\textsuperscript{123}
There are proposals to organize a westward relay of waters through a series of small East-West canals from the Brahmaputra to the Indus-Luni basins that would ultimately transfer some 15 to 20 M.A.F. surplus Ganga Basin waters to the arid regions of Haryana, Rajasthan and Gujarat. The technology for these East-West inter-basin transfers is not very complicated. Using the foot-hill slope of the Himalayas as a jumping pad, water from every tributary of the Ganga will be transferred to the next major tributary immediately to its making a short gravity canal.\textsuperscript{124}

Should India, Nepal and Bangladesh cooperate and all proposed schemes in the Ganga and Brahmaputra basins fructify, it could be possible in future to transfer 20 M.A.F. of water to the Peninsular-network.\textsuperscript{125} It will create additional storages of up to 180 M.A.F. (70 M.A.F. in the Peninsula, 10 M.A.F. in U.P., 50 M.A.F. in Nepal and 50 M.A.F. in the Northeast on the Brahmaputra system) and will generate 40,000 MW of power.\textsuperscript{126}

India, Nepal and Bangladesh no longer see themselves as an island immune to the global forces of change, but recognize the need to optimize their individual and collective benefits from what the global environment has to offer. In part, the economic liberalization policies followed by India, Nepal and Bangladesh signifies the acceptance of this change. As these countries welcome the inflow of extra-regional capital, technologies and investment for economic growth, Continental South Asian countries shall have to accept the need for working together to avoid the backlash of the globalization processes.\textsuperscript{127}

In the ongoing process of liberalization, the private sector has emerged as an important player in remoulding traditional approaches to economic development. The intra-regional relations will increasingly feel the punch of new socio-economic and technological forces in the new developmental models of developing countries. These countries will have to adjust and re-fabricate their hide-bound approaches. Earlier they do it better. Private investments will come in only if the countries concerned create the domestic
conditions such as proper pricing, politico-legal basis, institutional restructuring etc., and establish a framework of cooperation for optimum utilization of Ganga River Basin. Such cooperation will have to be bilateral/multilateral in nature. There is considerable scope for regional cooperation in Ganga River Basin by way of carrying out studies, coordinating investments in infrastructure, exchanging experience in creating conditions for the inflow of private investments and to the extent possible, harmonizing policies in this regard.

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30. Ibid.
31. Ibid.
32. Ibid.
34. Ibid.
35. Ibid.
37. Ibid.
38. Ibid.
40. Ibid.
41. Ibid. Also see N.K. Bose “Rivers of West Bengal and their control”, op. cit., pp. 59-60.
42. ENCYCLOPAEDIA BRITANNICA, vol. 7, op. cit., 879-880.
43. Ibid.
44. Ibid.

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55. Ibid.

56. “The Ganga is above all the ‘River of India’ ” wrote Jawaharlal Nehru, in THE DISCOVERY OF INDIA. There is an emotional exaggeration in such a statement, but that may well be justified by the fact that almost the whole of northern India, north and east of the Deccan Plateau, falls within the drainage basin of the Ganga. See Mukerji, A B and Ahmed Aijazuddin: INDIA- Culture, Society and Economy (New Delhi) 1985, p. 543.


58. It was decided in 1951 to construct a barrage at Farakka, a village in Mushirdabad district of West Bengal, near Bengal-Bihar border, about 400 km. north of Calcutta. It is an important port of India situated on the banks of the river Hooghly. The Calcutta Port played major role in trade based economy of the Britishers. The port has inherited its economic importance after Independence. For details see, Mukherjee N: THE PORT OF CALCUTTA-A Short History (Calcutta) 1968.

59. Ibid.


61. Ibid.


68. For political developments in Bangladesh see Chitkara, M. G: *BANGLADESH-Mujib to Hasina* (Delhi) 1997.


88. In October 1980 the 1977 Agreement was extended for another two dry seasons. It was renewed for another two years in January 1983. See KEESEING’S CONTEMPORARY ARCHIVES, 5 November 1982, col. 301904. Also see Sunil Munshi, “Rivers in Delhi-Dhaka Talks”, Patriot, 21 October 1982.

89. 1985 Accord provided that the Ganga Waters will be shared for a period of three years beginning from the dry season of 1986. Bangladesh was to receive 35,000 cusecs of water during the dry season and India’s share was 40,000 cusecs. See Annual Report, Ministry of External Affairs, Government of India. New Delhi, 1985-86.


94. Ibid. Also see NaliniKant Jha, “India-Bangladesh Relations: A Perspective”, India Quarterly, vol. LVI, No. 3-4, July-December, 2000, pp. 15-34.

95. Ibid.

96. Ibid.

97. Ibid.

98. Ibid.

99. Ibid.

100. Ibid. Also see NaliniKant Jha, “India Bangladesh Relations – A Perspective” India Quarterly, vol. LVI, Nos. 3-4, July-December 2000, p. 27.

101. Ibid.

102. Ibid.


106. Ibid. As expected, the West Bengal branches of the Congress Party and the Bharatiya Janata Party criticized the treaty. They considered that Calcutta’s interests were sacrificed in the name of improving relations with Bangladesh. The Bharatiya Janata Party (B.J.P.) was doubtful regarding the idea of channeling the flow from the Sankosh River in Bhutan. Tapan Sikdar, All India Secretary of the B.J.P. said that nothing less than 60,000 cusecs of water through the Bhagirathi canal could stop the silting of the navigable channels of the Calcutta Port and reduce the salinity of the Hoogly. The then B.J.P President L.K. Advani criticized the treaty by saying that it was detrimental to the interests of the riparian states of Bihar and Uttar Pradesh. In Bangladesh, the principal opposition to the Treaty came from Bangladesh National Party (BNP) leader Khalida Zia. For more details see Biju, M.R. INDIA’S FOREIGN POLICY, Towards A New Millennium, op. cit., 382-86.


112. Ibid.


114. Initially, India was hesitant to consider the Bangladesh’s proposal to include Nepal in water sharing talks but later on agreed to include Nepal. It was made clear that bilateral talks regarding Ganga water sharing would continue and Nepal would be included to collect data in order to formulate a plan, The Times of India, 12 May 1987. Also see The Kathmandu Post, 20 June 2000


116. Ibid.


120. Ibid., pp. 39-43.

121. Ibid.


123. Ibid.


125. Ibid.
126. Ibid.