# Floods in Nepal, India and Bangladesh: a regional overview

Flood in Bangladesh is a natural phenomena. Situated at the confluence of three mighty rivers, the Ganges, the Brahmaputra and the Meghna, about orfe fifth of the country is flooded every year.

The damages due to floods is colossal when floods of severe magnitude occur as happened in 1987 and 1988. In 1987 about 57,300 sq. km was flooded. The highest ever recorded flood of 1988 affected an area of 89,970 sq km. In 1988, the damages due to flood was assessed to the tune of Taka 4000 crores fUS\$ 1200 million).

#### Floods in the Ganges basin — 1993

The trend of floods in 1993 is peculiar this year in this subcontinent. Nepal, India and Bangladesh has been severely affected by floods. Preliminary information of floods in the Ganges basin in Nepal, India and Bangladesh show that the flood of 1993 is worst in Nepal and India. Magnitude of 1993 flood is yet to be assessed as the monsoon months are not yet over.

Nepal's worst flood in six decades occurred in 1993 which has claimed 2000 lives already. The death toll may rise to more than 3000. More than half a million hectares of farm land with standing crops were damaged. "This kind of natural calamity has never taken place in 100 years" - an official of the HMG of Nepal said of the 5 days of incessant rains that has caused severe flooding and land slides across the Himalayan Kingdom. The flood has affected 35 of Nepal's 75 districts.

India is affected by worst flood of the century in northern India, the death toll is more than 1100 and caused extensive damage to crops and homesteads in 15 States in northern

The Indian Prime Minister P V Narasimha Rao during his 4hour aerial visit to flood affected area in Bihar called for the construction of more dams in mountainous Nepal to prevent annual monsoon floods in Indian plains.

He is reported to have said We have to make Nepal agree to it as most of the major rivers originate in Nepal. We have been holding talks but not enough progress has been made" (PTI New Delhi and the Bangladesh Observer, July 31, 1993).

The floods in 1993 in Bangladesh so far affected 32 out of 64 districts covering an area of 28,742 sq km. About 9.3 million people were affected and 162 lives were lost, causing extensive damage to crops and dwelling houses and infrastruc-

Flooding in Bangladesh is caused by the following factors: Natural:- High monsoon precipitation in all the catchments within a short span of time resulting is huge monsoon flows from across the border. -Heavy local precipitation. High tide in Bay of Bengal with south westerly monsoon winds that obstruct drainage of the upland. - Synchronization of peak flows of the major river. Man Made: - Deforestation

in the upper catchment. Drainage congestion due to uncoordinated development ac-

### **Present Situation**

The one and half-month-long floods have inundated half of the country. There is a strong apprehension that waves of flood may occur in August and September if the rainfall in the upper catchments continue.

With synchronization of floods in the Ganges and the Brahmaputra, the situation may get worst in Bangladesh. The Meteorological Department and the Flood Forecasting and Warning Centre of Bangladesh Water Development Board (BWDB) apprehend more rains and floods in August and September due to heavy rains in the upper catchment and within the country. 'The overall rainfall pattern in Bangladesh this year is 20 to 30 per cent above the normal and is likely

to remain unchanged till the

The recommendations of the Joint Study Teams/Task Force are given below: Recommendations of the Nepal-Bangladesh Joint Study Team: (a) Flood Mitigation: (i) Development of Flood Forecasting and Warning System. (ii) Initiation of Catchment Management, afforestation programme aimed at soil conservation. (iii) Coordination of development activities aimed at getting away from drainage congestion. Harnessing of Water Resources of the Region (iv)

Amjad Hossain Khan lution for the problems of flood and droughts through multiple and optimal use of water resources in hydro-electric generation, navigation and irrigation by means of flow regulation including power systems inter connection and therefore, calls for regional cooperation. For concrete programming of this activity all the beneficiaries (Nepal, India, Bangladesh) should get together and work in a common forum.

Training: (ii) Exchange experience and expertise in the study and research for effective river training works. Drainage Improvement: To carry out dredging of offtake, mouths, and manmade channels to improve river con-

> veyance capacity. Flood Forecasting and Warning: The flood forecasting data can be exchanged by both the sides by direct point to point communication.

Flood Plain Zoning: The two sides may gain from each other

experience. Disaster Management: It was considered that both sides could immediately benefit from each others experience and agreed to have exchange of ideas and experience in this field.

Research and Modelling: Each side may identify items of interest on the subject that may be considered useful.

Training and Technical Expertise: The existing facilities and visits to the work can be availed of in the field of flood management as may be mutually agreed upon.

Flood Mitigation Measures: Floods can be mitigated by two ways; structural and non structural measures which are briefly explained below:

Structural measures: 1) Storage reservoir 2) Catchment and Forest Management 3) Embankment 4) River Training 5) Drainage improvement

Non Structural Measures: 1) Flood Forecasting 2) Flood Plain Zoning 3) Disaster Manage-

Bangladesh being at the lower end of the three mighty rivers with 90 per cent of the catchment area outside her territory, no effective flood mitigation is possible without the cooperation of upper riparian countries India, Nepal and Bhutan.

Bangladesh has constructed embankments, River Training Works and Drainage improvement in her river system to minimise the adverse effects. Bangladesh has also set up Flood Forecasting and Warning Centre to warn the population of flood hazards. BMD and FFWC also predict warning signals for disasters like cyclones, tornadoes and tidal surges.

The non-structural measures have their limitation and only effective if normal floods occur. But these measures are not very effective against severe

Flood Action Plan of Bangladesh: After the disastrous flood of 1987 and 1988, the Government of Bangladesh undertook a comprehensive review of the flood policy. A number of studies were carried out and in June, 1989, the Government requested the World Bank to develop and coordinate a five year Flood Action Plan (1990-95) for long term flood control programme in order to find solution of the major problems which is technically, financially, economically and

environmentally sources. The Flood Action Plan comprises 11 plan components and 15 supporting activities. It is coordinated by the Government of Bangladesh and the World Bank. The Action Plan is undertaken in parallel with Agriculture and other rural development programme and a programme of non-structural measures including flood warning and flood preparedness.

Proposals for Flood Mitigation in the Region: As

floods are a recurring problem in Nepal, India and Bangladesh, each country within their own capabilities and availability of funds have taken up flood mitigation measures, structural and non-structural as may be applicable in each country.

The floods in 1993 in Nepal, India and Bangladesh has proved that such individual efforts are not enough grantee again floods of severe magnitude. Structural measures afe therefore, a must for mitigation of floods. And their effective

shed management will surely improve the situation. But this is a slow process and will take a long time to be effective.

India is aware of the importance of catchment/watershed management. They have set up a National Land Use and Conservation Board. Out of a total of 173 million ha of the eroded and degraded area about 31 million ha has been protected.

Nepal is very much concerned about the loss of top soil caused by surface erosion and



A woman carries a child to safety as two children try to catch fish in the flood waters that have inundated their homes on the banks of the Jamuna river in New Delhi - AFP photo yesterday.

flood management, a realistic approach for basin development in cooperation of all countries Nepal, India and Bangladesh should be taken up.

Catchment/Watershed Management: The proposed objectives of an integrated catchment management plan are (a) to assess and severe manmade

is fully conscious of the deforestation problem. Nepal is already engaged in serious efforts to prevent deforestation and has undertaken afforestation schemes. Nepal is trying to popularize bio-gas generation for reducing dependence on figewood. Dams/Storage Reservoirs:

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ecological degradation, (b) rehabilitate badly degraded steps through reforestation and (c) to reduce runoff and soil erosion to the minimum possible extent. Catchment Management, therefore, involves forest management on a macro scale specially in the Himalayan foothills where deforestation has systematically degraded slopes Forests are generally regarded as regulators of stream flow and extended to suggest that forests can help mitigate floods.

The indiscriminate destruction of forest in Nepal, India and Bangladesh has aggravated the situation. Catchment/water-

Experience has shown that multipurpose reservoirs in combination with embankment in lower reaches have provided more effective flood control and protection than mere embankment and river training works The most effective approach to flood control which is likely to be the best approach to optimum utilization of water resources has to be mitigated one combining storage reservoirs, embankments, catchment protection, river training work to meet the specific requirements of a bastn. Generally flood damages are caused in low flat deltaic regions and the scope of construction of storage reservoirs lies in upper catchment of the river systems.

Bangladesh being a flat country, there is no suitable sites for construction of Dams/Storage Reservoirs. Or ily one dam has been constructed on Karnafuli River at Kaptai.

Of the 51 potential dams sites identified in India in the Ganges basin, 29 were completed or under construction and 22 were proposed. A few potential reservoirs sites are available in the Brahm aputra and the Meghna river sy stems. Construction of the high 1 dams with flow regulation will largely mitigate flood hazards.

· Studies conducted in Nepal have identified 30 re servoirs sites. The total estimat ed water holding capacity of the se reservoirs has been estima ted to be 77 billion m3 which constitute about 68 per cent of total monsoon flow of July, August and September. If these reservoirs are constructed they will be effective in mitigating; floods in the Ganges. In add itions, the monsoon water sto red in the reservoirs will be available to dry season augmenting of flow and generate large hydropower

Base on available information it is seen that the possibilities of flood regulation dams in Nepal are very encouraging: -Five reservoirs in the Sapt Kost basin after full de velopment can store 56.4 per cent of total monsoon flows. -Nine reservotrs in Gandak Hasin can store 54.7 per cent of total monsoon flow. -Three reservoirs in Karnali basin can store 100 per cent monsoon flow. -Two reservoirs on Mohakhali can hold 43.2 per cent of monsoon flow. -Reservoirs on southern small rivers in Nepal can store 60 to 100 per cent of monsoon flows.

The flood is a perennial problem in the region particularly in Nepal, India and Bangladesh. The non-structural measures have been taken up by individual countries. There is limitation if taken up separately. But there is scope of further improvement if all the countries cooperate for taking effective measures with exchange of data, information and experience with each other.

While three countries are going ahead separately with nont structural measures, there is a need for structural measures for reducing the damages due to recurring floods. Most effective structural measure is construction of storage reservoirs in the upper reaches of the basins. There are potential storage sites in India and Nepal. Nepal is willing to cooperate provided all the co-riparians Nepal, India and Bangladesh get together and work in a common forum to prepare a coordinated programme of work.

The statement of the Indian Prime Minister for the construction of dams in Nepal to prevent annual monsoon floods in the Ganges basin is significant and deserves consideration. If the three countries Nepal, India and Bangladesh join hands in a spirit of regional cooperation, the future problems of floods can be mitigated for the benefit of millions of people. India should take the initiative to start the dialogue immediately. Nepal and Bangladesh will cooperate in this venture.

\* The author is a retired Chairman, Bangladesh Water Development Board and Vice President (Hon) International Commission on Irrigation and Drainage (ICID).

ATPARA (Netrakona): Flood brings sufferings to the tiny fishing village of Guatoli. Renu Bala Devi aboard a fishing boat washing two glasses of brass and one aluminium bowl in the flood water. One of her daughter in law looking after the children of the 12-member family while the other is bringing drinking water from a nearby tubewell. Flood water has inundated all the small shanties of Guatoli where people have taken shelter on the boats. The family of Renu Bala Devi had built one makeshift platform inside the house which has been submerged by the rising level of flood water. Later the family decided to live on boat.

end of monsoon (end of September)" quoted Head of storm warning centre of the Meteorological Department (The Holiday, July 30, 1993).

#### Overview of Flood

After the devastating floods of 1988, Bangladesh approached India, Nepal, Bhutan for help to find out ways and means for combating such natural disasters. Three Joint Study Teams were set up by the Governments of India, Nepal, Bhutan with Bangladesh in 19£8 to make recommendations on structural and non-structural measures of Flood Mitigation and Flood ManageCreation of reservoirs at upstream reaches for optimal and multiple use of water resources of the region which interalia could achieve flood peak attenuation of lower

#### Study, Research and Investigation

(v) Study, research and investigation programme on appropriate catchment management to reduce the adversities such as top soil erosion, land slides and consequential influx of sediment in the rivers and glacial and snow melt phenomenon including high atti-

#### Recommendation of Bhutan-Bangladesh

Flood Forecasting and Warning: (i) Exchange of data and information on hydrometeorology of the concerned catchment area and rivers may be undertaken.

Watershed Management: (ii Joint Study, research and investigation programme for appropriate watershed management to halt adversities such as top soil erosion, land slides and consequent heavy inflow of sediment in the downstream reach of the rivers.

Hydrometry: (iii) To undertake necessary measures in carrying out hydrological obser-

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The report of flood mitigation measures and multipurpose use of water resources prepared by Bangladesh-Nepal Joint Study Team was submitted to the Governments of Nepal and Bangladesh in November, 1989

The report on flood control and flood mitigation prepared by the Bangladesh-Bhutan Joint Team of Officials was submitted to the Governments of Bangladesh and Bhutan in December, 1989.

The report on flood man agement prepared by the Indo-Bangladesh Task Force was submitted to the Governments of Bangladesh and India in

50-km-long

roads constructed

new roads were constructed

and 1,035 km long-rural roads

repaired in the district costing

over Taka 2.35 crore during the

last financial year, reports UNB.

neering Bureau sources said

about Taka 5.04 crore has been

spent for constructing eight km

long bituminous roads, 12 km

pueca roads and 30 km long

culverts were constructed on

the roads for the easy move

ment of traditional rural trans

new roads and repairing of old

ones, road communication in

the rural areas of the district

Tagore's death

anniversary

observed

Aug 11: The death anniver-

sary of Rabindra Nath Tagore

was observed in this district

ports and other vehicles.

Besides, 74 new bridges and

With the construction of the

Local Government Engi-

Aug 13: Some 50-km-long

FARIDPUR

kutcha roads.

BARISAL

Of these means, the development of Flood Forecasting and Warning System seems to be relatively simpler and could be implemented in a shorter span of time. It was recommended that cooperation between Nepal and Bangladesh could be extended for transmission of reat time water levels and flows of the important tributaries of the Ganges namely Kosi, Gandak and Karnali by point to point wireless commu-

The fourth activity needs to be looked into from wider perspective of finding durable so-

vation and studies on the Mangdechu (Manas), Mochu (SunKosh), Amochu (Torsa) and Wangchu (Raidak) rivers. (d) Research, training and exchange of Technical Expertise: (iv) Exchange of expertise between Bangladesh and Bhutan in the field of water resources on a continued and long-term

Recommendation of India-Bangladesh Joint Study Team: (a) Embankment: To identify gaps in embankments of the common rivers near the border and coordinate their tying up together taking into account the local conditions. (b) River

## Fresh flood in Sirajganj, Pabna: crops damaged

SIRAJGANJ, Aug 13: The flood situation in the district again took a serious turn on Thursday as the river Jamuna began to swell due to onrush of water from the upper areas, reports UNB.

Official sources said, the water level in the river rose 15 cm during the last 24 hours' till 10 pm on Thursday submerging 120 villages in five thanas.

Standing crops on about 3,000 acres of land in the thanas - Kazipur, Belkuchi, Chowhali, Shahjadpur and

### Brahmaputra devours 100 houses in two days

GAIBANDHA, Aug 13 : About 100 houses of Datiapara in Fulchari thana in the district have been devoured in the river Brahmaputra during the last two days, reports UNB. The erosion of the river

with due respect, reports BSS. Brahmaputra at Sidari, Different educational, socio-Kamarjani and Mollarchar in Sadar thana and eroston of the cultural organisations and literary organisations took up difriver Teesta at different places ferent programmes to mark the of Sundargant thana of the district have been continuing.

Sadar - were washed away by the flood water.

Patagram and Meghai roads and Meghai Hat also went under water during the period. Meanwhile, some 7,500 people of 150 families in Kazipur and Chowhali thanas were rendered homeless due to

crosion by the river Jamuna of-

fictals added. A report from Pabna says: Floods-hit riverside areas as the Jamuna and the Padma again swelled amid heavy rain, inun dating 16 villages in the district during the last 24 hours ending

10 am on Thursday. At least 5,000 people of Bera and Sujanagar thanas were reported marooned as flood water entered Banar-Char, Khanpura and Char-Sharma in Bera and Raniganj, Tantiban and Nazirganj areas in Sujanagar

Official sources said crops like IRRI and Aus paddy, jute and chilly on 3,000 acres of land were washed away by the flood water during the period. According to Flood Control

Room, water level of the Padma also increased by 32 cm while the Jamuna rose 19 cm during the last 24 hours. Water levels of the Padma and the Jamuna have been

rising for the last seven days,

but the two major rivers were

still flowing below red marks.

Another report adds: The district BNP on Thursday decided to expel one of its leaders for his anti-disciplinary activities and violation of party constitution.

Pagty sources said a meeting of the executive on committee, held at Annada Gobinda Public Library auditorium on Thursday morning, decided to oust Advocate Abul Ahsan Gora, a member of the EC and President of Pabna Chamber of Commerce

#### **BDR** seizes cow hides worth Tk 1.50 lakh

SATKHIRA, Aug 13: The BDR personnel setzed 140 pieces of cow hide worth about Taka 1.50 lakh from Hijla border area in Kaligani thana of the district on Wednesday, reports UNB. Acting on up, BDR men fol

lowed a group of smugglers while they were taking the said goods to Satkhira. Sensing the BDR personnel, the smugglers fled away leaving the hides on the spot.

A case was filed with Kaliganj police in this connec-

The recovered hides were deposited with local customs godown.



Health Minister Kamal Ibne Yousuf speaking at a function on the occasion of cheque distribution among the farmers of Faridpur district on August 5 as a part of the government incentive programme to the private dairy firm owners. A K M Nurul Huda, DC, Faridpur (left) and Dr Ziauddin Ahmed, Additional Director, Livestock Dept (right) are also seen on the occasion. A total of Taka 14,81,000 was distributed among 39 farmers in eight thanas of the district. More 35 farmers will get Taka 6250 each during the next phase.

## District roundup

MALJDEE COURT Shortage of. doctors, medicines in hospital

Aug 13: The General Hospital of the district is beset with various problems causing untold sufferings to the patients, reports UNB.

The number of physicians is too small in the 150-bed hospi tal. They cannot cope with the increasing numbers of patients seeking treatment. There are no doctors at all in many departments, local people said.

Besides, acute accommodation problem and shortage of medicine have also been hampering the treatment of the indoor and outdoor patients. A large number of patients are coming to the hospital every

day for treatment from far flung

areas but most of them are to

go back disappointed due to shortage of doctors and medicine. Of the admitted patients nearly 40 to 50 patients have to remain on the hospital floor due

to want of bed. Prime Minister Begum Khaleda Zia during her visit in the district a year back announced that the hospital bed would be raised to 250.

But no steps have yet been taken to implement her commitment.