

From New Delhi by Susan Maitra

A challenge for the region

The Bangladesh flood calls for a multi-national water-management effort of the area's three main rivers.

In the wake of unprecedented death and destruction caused by the 1988 floods, Bangladesh President Hossain Ershad has appealed for setting up an expert-level meeting of the South Asian Association for Regional Cooperation (SAARC), countries to explore the ways to fight natural calamities like floods.

Although floods are annual affairs in Bangladesh, the dimensions of the current flooding have brought the shocked attention of the world to the problem. More than 50 million people have been affected already.

Although the actual extent of damage will be known only when the water recedes, as of now, 25 million people have been rendered homeless, close to 1,000 have lost their lives, and crops worth \$800 million have washed away in the fury of swirling waters.

Millions remained marooned, surrounded by boundless waters, and the specter of disease and hunger is stalking this nation of 105 million people. As of Sept. 11, waste and garbage disposal systems were still inoperative in the capital, Dhaka, and water gushing through sewer manholes was flooding vast areas with a mixture of water, garbage, and excrement, according to the *Bangladesh Times*.

While various nations are coming forward to help manage the crisis, President Ershad is seeking a durable solution to the underlying water-management problem that caused it. Such a solution is vital for Bangladesh's survival and future prosperity.

Located at the confluence of three major rivers—Ganga, Meghna, and

Brahmaputra—Bangladesh is a flat land through which the flood waters from the Himalayan catchment area flow to the Bay of Bengal. The total catchment area of the three major rivers adds up to 600,000 square miles of which only 10% is in Bangladesh.

It is heavy rainfall in the catchment area, as happened during this monsoon, that swells the rivers and causes the floods.

Besides the big three, there are 49 more rivers that flow through Bangladesh or merge into the major rivers. None of these originate from within Bangladesh itself. Many of them originate in the northern Himalayas and bring the water in a current to meet the major rivers.

These smaller rivers carry water moving at a high velocity, causing a hydraulic ram when it meets the wider rivers and makes them overflow.

Apart from such topographical difficulties, the major rivers carry a large amount of silt—churned up in their long journeys—and deposit this silt at a very high rate when the fury of flood abates. All the major rivers in Bangladesh are depositing much more silt than they are carrying to the sea.

The confluence of the Ganga and Meghna (the Brahmaputra meets the Ganga a few miles upstream), near the capital city Dhaka looks like a sea during the monsoon. But during the dry season, it resembles a string of narrow streams winding around large silt islands.

The high content of silt in river water raises the river bed, reducing its water-carrying capacity significantly.

According to Dr. H.R. Khan, professor of water resources and engineering at Dhaka's Bangladesh University of Engineering and Technology, there might also be a relationship between earthquakes and floods. Dr. Khan pointed out that there were major earthquakes in 1954 and 1955.

Many believe, he said, that some natural water reservoirs were destroyed by the earthquakes.

While annual and intense dredging at the chokepoints of the major rivers would relieve some of the pressures and reduce flooding, the key to the solution lies in harnessing the major rivers upstream and reaping benefits from the stored waters.

But this requires the regional approach. In particular the involvement of India, Nepal, and People's Republic of China is necessary. A joint regional river commission, including flood control, needs to be set up to formulate a plan and program to tame the rivers.

The main elements of such a plan are obvious, but must be mapped out in detail. They include reforestation in some parts of the Himalayas to reduce the silt flow, building a number of large reservoirs that can regulate the flow of water, diversion of water to other rivers when and wherever possible, systematic annual dredging of the riverbeds at the chokepoints in the major rivers, and building of embankments in some parts of the rivers to narrow the width, increasing the flow rate to wash the silt out to the sea.

According to a now-dated World Bank estimate, it would cost more than \$25 billion to tame the more than 50 rivers flowing from the Himalayas into Bangladesh through India, Nepal, and People's Republic of China.

Whatever the cost today, it cannot be more than the cost of the death and destruction wreaked by the floods.