

Development Interventions in the CHT

by Dr Mahfuzul Haque

Prior to implementation of any project, the stakeholders at the community level are to be consulted and involved in every stage of the project. Following NEMAP exercise, hill people's concerns, hopes and aspirations can be identified, which may turn into an implementable Action Plan.

AGAINST the backdrop of signing of the Agreement between the Government of Bangladesh and Parbatya Chittagram Jana Sanghati Samiti (PCJSS) on 2 December '97 and surrendering of arms by Shanti Bahini on 10 February '98, time has come to take a fresh look on the pattern of development interventions that are forthcoming in the CHT.

Development partners are showing increasing interest in participating development efforts in the CHT, so long remained out of bound for the donor community, foreign visitors and tourists. A land of bush war and insecurity has turned into a land of peace and progress. Between the hills and hillocks, creeks and rivulets, reeds and forests, finally peace found its ultimate sanctuary. Peace is a pre-condition to development. Hopefully, peace remains in CHT, all out efforts are to be taken to have a sustainable development of the Chittagong Hills.

Recently the government has prepared a portfolio of projects to meet the short, medium and long term needs and to take emergency relief measures in the CHT. The interventions suggested by the government are: i) construction of infrastructure for the Regional Council; ii) repair, renovation and development of secondary schools and colleges; iii) supply of safe drinking water and sanitation; iv) development of road network; v) strengthening of CHT Development Board (CHTDB); vi) rehabilitation and socio-economic development of women; and vii) socio-economic rehabilitation through plantation of rubber and fruit trees. A total of about Tk 2000 crore (\$ 500 million) has been estimated to fund these projects in CHT. In a recent meeting held at Planning Commission, the development partners were informed of government's priority intervention areas in the Chittagong hills. Discussion and dialogue are on.

Prior to undertaking of the proposed development activities, following issues are to be looked into:

What is the carrying capacity of the Chittagong Hills?

Whether, the development interventions to be taken in the CHT are eco-friendly;

Whether, Ethical Impact Assessment (EIA) has been conducted prior to such development measures;

Whether, people of the hills at grassroots level are consulted during drafting, implementing and monitoring of these projects;

Whether the issues of the minority groups, women and tribal communities are given special consideration;

Whether a participatory planning process, similar to that of many "bottom-up" plans have been followed;

Whether the Regional Council, tribal chiefs, Headmen and Karbaris were consulted. It may happen that priorities of the hill people are different than that of the proposed interventions. They would definitely stress upon education, health and sanitation, income, employment generation activities. In a country infested with malaria, health is of prime importance. Cerebral malaria, a killing disease, is present everywhere in the hills. A person bitten up by a carrier mosquito, if not treated immediately, may say "good bye" to this mother earth within no time. A number of our soldiers died in the hills due to malaria. Besides, marauding elephants and wild pigs cause destruction to gardens and crops. In many areas of Ramgarh and Manikghari, in last ten years, around 455 people have lost their lives in the stampede. People seek respite, but all go in vain.

Agriculture sector could be another area of intervention. People in many areas of Rangamati and Khagrachhari districts still practice jhum cultivation. The slash and burn practice in jhum cultivation is not environment-friendly. International Centre for Integrated Mountain Development (ICIMOD) with its headquarters in Kathmandu has been involved in collaborative projects with CHTDB in rubber, horticulture and upland settlement projects. Slope Agriculture Land Technology (SALT) is environment-friendly and is being

practiced in some parts of CHT. Serious depletion of forests took place in the hills over the last two decades. Faulty jhum practices, influx of people from the plains, increasing demand for agricultural lands, denudation of hills by security agencies, increased number of brick fields, corrupt forest officials, dishonest businessmen — all took toll on the dwindling forest resources of the CHT. Massive afforestation is needed. Bio-diversity and wildlife of the hills should be preserved. Reeds and bamboos between the creeks are to be conserved. Many rare medicinal plants are fast disappearing. Indigenous knowledge and practices in the conservation of nature need to be tapped.

How to do that? Prior to implementation of any such project, the stakeholders at the community level are to be consulted and involved in every stage of the project. In this regard, the participatory planning process adopted by the Ministry of Environment and Forest in preparing National Environment Management Action Plan (NEMAP) is worth mentioning. NEMAP took note of the people's concerns expressed in many workshops held at grassroots, regional and national level. NEMAP was written by the people for the people. Following NEMAP exercise, hill people's concerns, hopes and aspirations can be identified, which may turn into an implementable Action Plan.

Who are the stakeholders? The institution of chieftainship, the tribal King, Headmen and Karbaris, non-tribal people, various professional groups are in the core of consultation. Institutionally, the Regional Council, Local Government, Ministry of Special Affairs, CHTDB, MOEF, Forest Department, Ministries of Agriculture, Fisheries, BARC, Agriculture Extension, Water Development Board, local NGOs are to be involved in the process. There are a few NGOs in the hills. Rarely any national NGO has any office there, perhaps due to security reason. With peace in place, grassroots activities would be in full swing.



Garfield by Jim Davis

Tom and Jerry by Hanna-Barbera

Problem of Arsenic and its Solution

by Dr A M Choudhury

Media can broadcast for the public that wherever you suspect ground water contamination by arsenic, please use filter and if you drink surface water please boil it....

THE problem of arsenic has come out to be a potential scourge for Bangladesh. Its magnitude is so great that it does not compare with any of the great scourges we encountered in the past like cholera, small pox, cyclones, floods etc. Nearly seventy five million people of Bangladesh are reported to be at risk now and as new data in the course of time are pouring in, may be almost the whole population of Bangladesh will be at risk!

We get a picture like this from the various news items that we're very often coming across. Very wrongly, one often gets an idea that it is a great scourge for which there is no solution and our fate is doomed. Highly qualified scientists are working probing the origin of arsenic and how it gets into the ground water and what complicated set of chemical reactions take place. But they seem to be at a loss even after applying all their sophisticated techniques. True, these scientific problems do not have a unique solution and may never be known exactly just like we may never be hundred per cent certain about the origin of the earth, the solar system or the universe. But for that matter people have not stopped getting benefits from the earthly and heavenly systems. We may not know exactly the origin of the solar system, but that does not stop us from predicting the solar eclipses or harnessing solar energy.

Yes, all the 120 million people of Bangladesh and the people of the whole world are exposed to great risks of their health all the time. There are innumerable number of deadly bacteria and viruses all around ready to attack us. But we survive either because of our

body defence mechanisms or, because of specific medicines applied in specific infections. Thanks to the discovery of broad spectrum antibiotics which are a cure for attacks by many bacteria. We do not know the cause of many diseases but most of them are curable.

The Daily Star has made a commendable job of organising a roundtable recently on the subject focusing the problem of arsenic contamination of ground water in Bangladesh. There has been an international conference and a seminar by the Bangladesh Academy of Sciences on the subject and deliberations have been made by eminent experts. The World Bank has reportedly come out with a big assistance towards countering this menace. But should we now wait ten years to find out the cause of the arsenic pollution in Bangladesh in order to come out with a remedy?

The fact of the matter, as has been pointed out by the experts is that in more than half of Bangladesh, specially the southern half of the country, the ground water in many shallow tubewells contain either arsenic or some sort of arsenic compounds which is beyond acceptable limit and can cause arsenic contamination including causing cancer if such water is continuously taken. Arsenic contamination is present mostly in shallow tubewells but in some cases water of deep tubewells also contain ar-

senic beyond acceptable limit. It has also been noticed that in those areas where arsenic contamination has been found, not all the tube wells contain arsenic. It is something like this: though influenza or pox is a contagious disease everybody in the same house is not attacked by it.

The origin of the arsenic and its flow or seeping into the ground water may be a time consuming field of research. Alternatively the cause may be a very simple one. Arsenic is present in all soils just like many other elements whether toxic or not. Some of the arsenic may be of anthropogenic in nature originating from the coating used in wooden poles. This arsenic may form into various compounds by chemical reactions because of the suitable environment present and since Bangladesh has the largest concentration of tube wells in the world which were sunk as a source of drinking water for almost all its 120 million inhabitants. Water is being sucked continuously for the last 20-30 years and may be because of this sucking action arsenic or arsenic compounds find their way into the ground water.

There could be other reasons also. But whatever may be the reason the fact is that arsenic is present in large number of tubewells whose water is drunk by even large number of people. Whether 70 million or 7 million people are at risk, there may be difference of opinion.

but the fact is that arsenic is the biggest scourge at the moment if not given due attention. Large number of people have been known to be suffering from arsenic poisoning and as it may take several years for the symptoms to appear after taking the arsenic poison, their number may increase drastically in due course of time.

But what is the solution? Scientists have pointed out very simple solutions. Very simple type of filters can be effectively used to remove arsenic. Before the advent of the tubewells, people had been using such filters and they are relatively inexpensive.

So wherever tubewells have been proven to be contaminated by arsenic, people should use filters compulsorily while drinking water from such wells. If they do not like to use contaminated tubewell water, they can drink surface water after boiling only. That is a simple solution and is within reach of most of the people. If the poor section of the populace who cannot afford a filter or fuel for boiling water, philanthropic people can come forward to help them. There could be some filters provided for the community use. The Zakat that is collected can be used for this purpose. The Grameen Bank or other organisations who are very generous in helping the poor can also come to such assistance. Entrepreneurs can come forward for mass scale

manufacture of filters since large numbers of them would be necessary and even if there is small profit per unit of the item, they can make an adequate profit.

Ground water is not only a problem in Bangladesh. In all the industrialised countries, both are highly contaminated water are highly contaminated from those sources in these countries. As a matter of fact, even lake or river water fish, though they are available in plenty, are not consumed in those countries. The water is contaminated if not by arsenic then by other toxic elements. While in Italy, I was advised not to drink tap water. People drink bottled water in those countries. Bangladesh has also started using bottled water. But this is not within reach of everybody. But the economic law says that production raises the demand. There is perhaps no economist than Maynard Keynes who seems more relevant today, who says: produce more and consume, there will be flow of money, people will become rich and there will be alleviation of poverty.

Finally, news papers, radio and television can play a great role in this effort. Just like during cyclones or floods special messages are propagated in newspapers, radio and TV, these media can broadcast for the public that wherever you suspect ground water contamination by arsenic, please use filter and if you drink surface water please boil it and you will be free from arsenic scourge.

The writer is Director (Research), Bangladesh Space Research and Remote Sensing Organization (SPARSO).

Arsenic in Drinking Water: A Technical Review

by Nadim Reza Khandaker

In communities, with the option of having both surface and groundwater, best water management practices should be adopted to optimizing both sources to provide reliable potable water.

ARSENIC in low amounts is an essential human dietary requirement, it is found in many foods such as meat, fish, poultry, grains and cereals. In high amounts, arsenic demonstrates adverse health effects. In excess amount, arsenic causes acute gastrointestinal and cardiac damage. Chronic doses can cause vascular disorders such as blackfoot disease, outbreak of which is prevalent in areas of Bangladesh where ground water is contaminated with arsenic. Arsenic has also been linked with skin and lung cancer. Arsenic has shown to be mutagenic (causing heritable alteration in genetic materials of cells) in several bacterial test systems, and sodium arsenate and arsenite has shown teratogenic (birth defects in offspring) potentials. United States Environmental Protection Agency (USEPA) has categorized arsenic as a human carcinogen (causes cancer).

Arsenic in drinking water sources are generally low. Usually, concentration of arsenic in surface water is well below specified maximum accepted contaminant levels. Inorganic toxic contaminants such as arsenic are exclusively a groundwater problem. Generally, erosion of arsenic containing surface rocks accounts for the most significant amount of arsenic in groundwater supplies. An other major possible source of environmental arsenic is the smelting of nonferrous metal ores, as found in copper works. Removal of inorganic chemicals can be difficult and relatively expensive in a per capita basis for small communities.

Guidelines for Maximum Allowable Concentrations of Arsenic in Drinking Water: USEPA Primary Drinking Water Regulations (1989) set the maximum contaminant level (MCL) of arsenic in drinking water at 0.03 mg/L. The World Health Guidelines of Drinking Water and the Canadian Guidelines for Drinking Water Quality (1987) set the guideline for arsenic in drinking water at the maximum allowable concentration (MAC) of 0.05 mg/L. The European Economic Community Standards for Parameters Concerning Toxic Substances set the maximum admissible concentration of arsenic at 50 ug/L.

Chemistry of Arsenic in Groundwater: Although arsenic can exist in both organic and inorganic forms, only inorganic arsenic at the valency states of +3 (arsenite) and +5 (arsenate) have been found to be significant in potable groundwater. Depending on the redox condition of the groundwater arsenic exists as arsenite [As(III)] or arsenate [As(V)]. The pH of the water plays an important role in determining the arsenic speciation. The primary arsenate [As(V)] species found in groundwater in the pH range of 6 to 9 are monovalent $H_2AsO_4^-$ and divalent $HAsO_4^{2-}$. These anions result from the dissociation of arsenic acid (H_3AsO_4) at pK_a values of 2.2, 7.0, and 11.5. Uncharged arsenous acid (H_3AsO_3) is the predominant species of trivalent arsenic found in natural waters and it dissociates to $H_2AsO_3^-$ at pH greater than its pK_a value of 9.2.

Both the redox potential and pH is important with regards to arsenic removal from groundwater using anion exchange or activated alumina adsorption.

the two most economically viable options. Optimum arsenic (III) removal cannot be achieved by either of the two processes and has to be converted to arsenic (V) for removal. The process of conversion of arsenic (III) to arsenic (V) is by oxidation. The oxidizing agent of choice is chlorine. Laboratory tests with groundwater at pH range of 6-10 produced immediate conversion of arsenic (III) to arsenic (V), with a residual chlorine concentration of 1.0 mg/L. Arsenic reduction can also occur, e.g. As(V) in water was reduced to As(III) by addition of bisulfite, a reducing agent. This signifies that As(III) and As(V) are readily interconvertible depending on environmental conditions.

Treatment of Arsenic Contaminated Groundwater: There are numerous processes by which arsenic can be removed from groundwater. The most appropriate process and their removal efficiency depends very much on the condition of the source water and the scale of operation as a whole. In many cases combination of unit process is used to achieve treatment goals. The table below gives the list of some of the available treatment options and their arsenic removal efficiencies. Removal efficiencies are defined by the following rating system: Excellent (90 to 100 per cent removal), good (60 to 90 per cent removal), fair (20 to 60 per cent removal), poor (0 to 20 per cent removal).

| Treatment Process | Arsenic (+3) Removal Efficiency | Arsenic (+5) Removal Efficiency |
|--|---------------------------------|---------------------------------|
| Coagulation processes, Sedimentation, Filtration | Fair-Good | Good-Excellent |
| Lime Softening | Fair-Good | Good-Excellent |
| Anion Exchange | Good-Excellent | Good-Excellent |
| Reverse Osmosis | Fair-Good | Good-Excellent |
| Granular Activated Carbon | Fair-Good | Fair-Good |
| Activated Alumina | Good-Excellent | Excellent |

For a small community the treatment options of oxidation followed by anion exchange or adsorption with activated alumina would probably be the most cost effective treatment options. Anion exchange has the added advantage of nearly complete bed regeneration (85 to 100%) using sodium chloride for elution of arsenic from spent resin. The limitation of anion exchange is that it is not economically attractive for source waters with high total dissolved solids (TDS) (>500 mg/L) or high sulfate levels (>25 mg/L) due to competition for sites by background ions. Activated alumina is more resistant towards background contamination but requires both 4% sodium hydroxide and sulfuric acid for regeneration.

In communities, with the option of having both surface and groundwater, best water management practices should be adopted to optimizing both sources to provide reliable potable water.

The writer is a Ph.D in Environmental Engineering from Pennsylvania State University

Tk 100 cr project to expand facilities for heart patients

The government has undertaken a project involving Tk 100 crore to expand the facilities for treatment of cardiovascular disease, reports UNB. Under the project, 400 additional beds and modern equipment will be set up at the National Institute of Cardiovascular Diseases. This was disclosed by Health Minister Salahuddin Yusuf while inaugurating the Second International Conference on Cardiovascular Diseases at Hotel Sonaogon yesterday. Some 25 renowned cardiologists from India, Pakistan, Canada, France and Kuwait, and about 300 from the country are taking part in the 2-day conference.

The world renowned cardiologist Dr KK Sethi of India has joined the conference. State Minister Prof Amanullah said, "We are trying to improve cardiovascular services since 1980. We have succeeded but it needs more." He laid emphasis on the regional cooperation, particularly among SAARC countries, to improve the knowledge in the field of cardiovascular complications. Health Secretary Mohammad Ali said, "We will be able to place the draft of the Health Policy within 6 to 7 weeks to the Cabinet." He informed the conference that some 50 doctors have been trained in cardiology for appointment at district level hospitals in the near future.

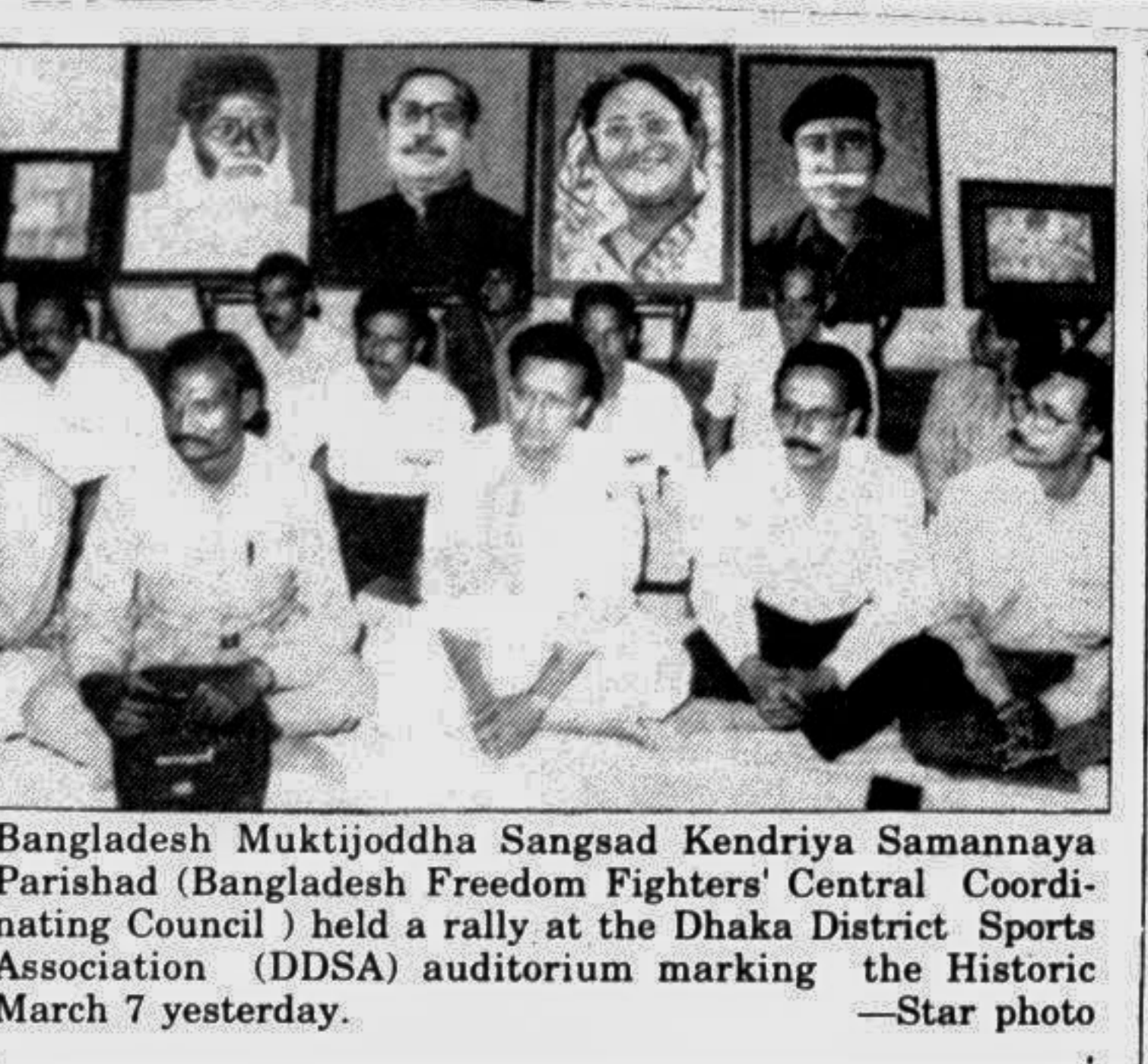
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New body of JCD Dhaka dist formed
By Staff Correspondent
A new committee of Dhaka district unit of Jatiyatabadi Chhatra Dal (JCD) has been formed with Mohammad Nazimuddin Nazim (Keraniganj) and Mohammad Walid Khan (Dhamrai) as president and general secretary respectively, says a press release.

Japanese grant for two NGOs
Japan will provide two non-governmental organisations (NGOs) in Bangladesh 1,38,040 US dollars under two grant contracts signed yesterday, a Japanese Embassy press release said, reports BSS. Hoshikazu Kaneko, Ambassador of Japan to Bangladesh, signed the two grant contracts under the Japanese Grant assistance for Grassroots Projects (AGRP). Quazi Zaher Ali, chairman, poverty eradication and environmental programmes and Edward McKenzie Abbey, country director, Plan International Bangladesh, signed on behalf of their respective NGOs.

PM presents deer to her Bahrain counterpart
Prime Minister Sheikh Hasina has presented a pair of spotted deer of Bangladesh origin to Shaikh Khalifa Bin Salman Al Khalifa, Prime Minister of the state of Bahrain, reports UNB. The deer were handed over on March 9 by Bangladesh Ambassador Gyasuddin A Chowdhury to the representative of the Prime Minister of Bahrain at the Embassy, according to a message received here yesterday.

Metropolitan



Bangladesh Muktiyoddha Sangsad Kendriya Samannaya Parishad (Bangladesh Freedom Fighters' Central Coordinating Council) held a rally at the Dhaka District Sports Association (DDSA) auditorium marking the Historic March 7 yesterday. —Star photo

| City/Town | Temperature | | Humidity on percentage | |
|------------|-------------|------|------------------------|---------|
| | max | min | morning | evening |
| Dhaka | 32.3 | 22.7 | 76 | 48 |
| Chittagong | 29.8 | 20.7 | 72 | 75 |
| Rajshahi | 29.0 | 14.3 | 59 | 67 |
| Khulna | 32.5 | 23.0 | 83 | 82 |

HERE and THERE

DUJA
By DU Correspondent
Shariful Islam of The Bangladesh Observer and Kailas Sarkar of the Dainik Sangbad were elected the president and general secretary respectively of the Dhaka University Journalists' Association (DUJA) for the current session. The new nine-member executive committee of the DUJA were declared elected unopposed. Other office bearers of the committee are: Vice President-Abul Kalam Azad (APB), joint-secretary- Shahidul Islam Rana (New Nation), Finance Secretary-Pinaki Roy (BNS) Office Secretary- Mamun-Or-Rashed (Janakantha). Three executive members of the new committee are- Sayem Bhuiyan (Muktakantha), Abu Naser Rajib (BSS) and Ratan Kumar Biswas (Manab Jamin).

DMB, BMD
Close proximity to the tropic of cancer and special geographic features of the Bay of Bengal made Bangladesh a frequent victim of severe tropical cyclones, weather experts said yesterday, reports BSS. The highest 225 kph wind-speed was registered in the country during the cyclone of April 29, 1991 which killed about 1,40,000 persons and created a tidal surge upto 20 to 25 feet, they said. The experts were addressing a day-long workshop on "speedy dissemination of weather warning signals" jointly organised by Disaster Management Bureau (DMB) and Bangladesh Meteorological Department (BMD) at Met Office in Agargaon in the city.

Rotary Club of Jahangirnagar
Rotary Club of Jahangirnagar Dhaka distributed 124 books for the students of Pre-Schooling Centre for underprivileged children at Resource Bangladesh, Uttar Adabor, Shaymoli in the city, says a press release. The books were supplied by Director General, Directorate of Non-Formal Education. The books were handed over to Mizanur Rahman, executive director, Resource Bangladesh by Club president Rotarian M Shafiqur Rahman and honorary secretary Rotarian M Ashraf Rahim at a simple ceremony recently.

North South University
Dr Lynton Hayes, executive director, Executive Education programme, Harvard University Business School visited Dhaka at the invitation of North South University (NSU), says a press release. Dr Hayes discussed the prospects of launching Executive Education programmes in Bangladesh with the assistance of NSU. Harvard University Business School is about to launch a similar Executive Education programme with the assistance of Witswatersrand University, south Africa with which NSU has academic collaboration agreement. Dr Hayes had a meeting with the Vice Chancellor of NSU Muleshchind Ahmad at his office recently.

More organisations condemn violation of 6-yr old girl

By Staff Correspondent
More organisations yesterday condemned the violation of six-year-old girl in the police control room at the CMM's Court building in the city Tuesday. They also demanded capital punishment to the culprit involved in the monstrous act as well as to enact a new law with the provision of exemplary punishment to check this kind of atrocity to women and especially to minor children. Bangladesh Shishu Adhikar Forum (BSAF) in a statement yesterday urged the government to ensure stern action against the person involved in the heinous incident. The members of BSAF also attended a rally organised by Bangladesh Nari Progati Sangha in protest of the incident yesterday. The rally was brought out from the central Shaheed Minar at around 5 pm. In another statement, Association of Development Agencies in Bangladesh (ADAB) called upon the people to formulate a "social protest" against oppression on women and children. Signatories in the statement are ADAB president Kazi Faruque Ahmed, vice president Arma Gunn, Treasurer Abdul Matin, director Shamsul Huda and CEN president Khushi Kabir. Women for Women (WFW) condemned the rape of the minor girl and expressed their deep shock and horror in this regard.