

REGIONAL CLIMATE VARIABILITY

Impact on water resources

The water regime of South Asia is of regional character and the water crisis should be solved regionally using collective efforts under SAARC forum. SAARC Meteorological Research Centre (SMRC) which is situated in Dhaka can play its due role in this respect.

PROF. DR. DEWAN ABDUL QUADIR

WATER is an essential element for pursuing the basic functions of livelihood and sustainable economic growth. In South Asia, monsoon rainfall and snowfall over the Himalayan mountains constitute critical resource for the region's large economy and livelihood. In some areas, 10-20% of total water budget comes from the snow and glacier melts over the Himalayas. The big rivers of the region the Ganges and Brahmaputra originate in the Himalayan reservoirs with huge deposit of snows and glaciers (Gangotri and the Kailas-Manasarowar regions respectively). Being fed by the rain and snow-glacier melt water, these rivers flow over vast flood plains and traverse thousands of kilometers and cross the territory of Bangladesh before falling into the Bay of Bengal. Moreover there are innumerable small rivers, canals, lakes and beels (swamp water body) which act as valuable water resources. The river Meghna is one of the important drainage systems of Bangladesh which originates by convergence of a number of rivers flowing from the Shilong Plateau situated in India to the northeast of Bangladesh.

The South Asian region is strongly dominated by the southwest monsoon activity. It experiences unimodal seasonal distribution of rainfall with principal amount of its rain-

fall (more than 70% in case of Bangladesh) belonging to the monsoon season (June-September). The pre-monsoon season (March-May) also produce good amount of rainfall (around 19% of the annual in Bangladesh). The winter is dry. The available surface water is not adequate for growing crops especially in the winter (December-February) and in the relatively dry part of the pre-monsoon months; these are the water deficit period of the annual hydrological cycle.

It is to be noted that the consumption of water is gradually rising in the region with time due to increasing population, parallel increase of crop production and accelerated growth in economic and social sectors the total water resources remaining more or less constant.

For the lower riparian countries like Bangladesh, the surface water deficit in the dry season has become very acute during the recent decades. The withdrawal of water from some of the transboundary rivers in the upstream aggravates this situation and severely affects the flow conditions within Bangladesh impacting severely on the environment and ecology of vast areas of the country. The best example is the river Ganges, the flow of which prior to entering Bangladesh is intervened at Farakka point.

Though there exists an agreement between India and Bangladesh for water

sharing but it is not of much help as the quantity of water reaching Farakka in the dry period is not so high to sufficiently augment the flow of Padma after sharing. The distributaries of Padma, which drain down over southern Bangladesh and fall to the Bay of Bengal crisscrossing the Sundarbans and adjacent areas, remain almost dry in the lean period. As a result the salinity front gradually moves to the north degrading the land quality of vast areas including the ecology and environment of the Sundarbans due to contamination with high salinity.

Moreover, the surface water irrigation practices over the flood plains of Padma have been seriously affected, because of which the ground water has been exploited for rice cultivation to overcome the food crisis of ever increasing population. It has been evident that the ground water level is declining due to its overexploitation i.e., the rate of withdrawal is higher than the normal rate of recharging during the monsoon season.

Above is the situation of the country's water resources; the global warming and associated climate change would exacerbate the environmental degradation and severely impact on various sectors such as water resources, agriculture, human health, coastal and other natural resources, etc. The frequency and severity of the weather related natural disasters are also increasing all over the world including Bangladesh. According to IPCC (2007) report, the warming of about 0.76 OC has taken place over the whole earth during the period of about one century. The warming rate has been accelerated in the recent decades. The general circulation models have predicted that the global temperature would increase due to enhanced greenhouse gas by about 1.5-5.80C by the end of the 21st century.

The studies have shown that the temperature have increased also over the region including Bangladesh. It has been reported that the average temperature of Nepal shows increasing trend of 0.0235 OC/year during the period 1966-2003. The stations situated in higher altitudes of the Himalayas have stronger increasing trends. The increased temperature is supposed to enhance the evaporation and evapotranspiration which would further aggravate the water stress. Most terrifying impact of warming that has been observed over the Himalayas is the overwhelming evidence of shrinking of the glaciers. The cause of such retreat of glaciers is the enhanced melting of the glaciers due to the increase of temperature possibly with concurrent lowering of the precipitation. The melting of the glaciers causes decrease in the Albedo (the reflecting power of solar radiation by the surface) of the areas resulting in higher absorption of solar energy providing feedback effect for further accelerating the



Gangotri glacier melt

warming rate and glacier melting process.

Accelerated glacial melt questions the very perennial nature of many of the Himalayan flowing rivers. By 2050, the annual runoff in the Brahmaputra is projected to decline by 14% (IPCC 2001), which will have tremendous downstream consequences. Increased warming might result in increased flow initially with reduced flow later as the glacier disappears. Available records suggest that Gangotri glacier is retreating by about 30 m per year.

Thus the increased population pressure, enhanced economic development, intensive agriculture and upstream intervention of the river flow being associated with water stress due to warming of the air and shrinking of the Himalayan glaciers will cause severe impacts on environment, ecology, agriculture, human health, economic development and livelihood of the people of Bangladesh. The sea level rise, loss of coastal lands due to northward extension of the tidal inundation due to sea level rise, increased salinity in the southern Bangladesh and enhanced weather related disasters add new dimensions to the problems. Poverty is a negative factor resisting the resilience towards the coping of the multidimensional impacts.

Now the major task before the nation is to analyze the details of the climate change, its variability and impacts on all sectors and for all the vulnerable areas of the country. This primary task is highly scientific in nature and requires multidisciplinary team work of climatologists, scientists, engineers and other relevant experts.

We particularly concentrate on the adaptation measures against the dry season water crisis. One of the national solutions would be to preserve the rain water and runoff flowing along the rivers using multipurpose dams within the country. However, more feasible as well as fruitful long term

solution would be the construction of dams over the upstream.

Studies in Nepal have identified 28 potential reservoir sites, 9 of which are classified as large, each having large storage capacity of over three billion cubic meters. From the Bangladesh perspective, the storage project in Nepal that has the maximum potential for augmenting the flows at Farakka is the Sapta Kosi High Dam Project. This potential reservoir envisages a live storage of about nine billion cubic meters, and the stored water behind the High Dam could augment the lean season Ganges flows and benefit both India and Bangladesh. It must be repeated here that storage reservoirs in the Himalayas would have to be multipurpose in order to be economically justifiable. These reservoirs may be used for fisheries and clean energy generation in the form of hydroelectricity in addition to water supply to rivers and canals and for other uses.

The water regime of South Asia is of regional character and the water crisis should be solved regionally using collective efforts under SAARC forum. SAARC Meteorological Research Centre (SMRC) which is situated in Dhaka can play its due role in this respect. Early Warning of Natural Disasters and Management in the context of climate change is also an important issue for the regional consideration.

At the end, I would like to stress on the development of expert manpower in the field of climate, weather, water and ocean. Though Bangladesh is a disaster prone country, its manpower development in the relevant fields has not yet got required attention. The expert manpower will be able to efficiently handle the problems.

The writer is former CSO of SPARSO and former head, Synoptic Division, SMRC, Dhaka. Email: dquadir@yahoo.com



Constrained water flow in the Padma

Going green for green baby

DR. MD. MIZANUR RAHMAN

A baby living in an eco-friendly, healthier, safer and happier place is called green baby. A greener life dedicated to sustainability is the prime condition of becoming a green baby. Green, eco-friendly, congenial, frugal, sustainable, simple, healthy, happy -- no matter what we each call it, we should try to create sustainable communities for our children so that they can live the lives they want to live.

How to raise a green baby?

Breast feeding: Breast feeding is highly recommended for the green baby. When the mother of the child is eating well, then the baby is eating well, there's no more difficulty to that "formula." Mother's breast milk is the healthiest form of milk for human babies. But there are some exceptions, such as when the mother is taking certain drugs or is infected with dangerous contagious diseases. It accelerates the physical and mental growth; build up immunity against diseases; and reduces the health care and feeding costs. **Green mom:** At first a mom goes green for growing a green baby. The mother should avoid amalgam fillings in any dental work. Hair dyes are harmful for the baby. She should eat organic foods. The smoker mom should quit smoking to avoid smoky environment. Cigarette smoke is

dangerous to baby. Drugs and alcohols are also harmful for the baby. The mom should reduce her exposure to aluminum by not using aluminum pots or cookware, deodorant or antiperspirant containing aluminum.

Saying "no" to disposable diapers: The disposable diapers are much more harmful to the environment and the baby than the cloth diapers. It is also a possible danger contaminating ground water. It may take several hundred years for the decomposition of disposables to take place, with some of the plastic material never decomposing. It is not possible to keep baby's skin dry, healthy and free from diaper rash with the disposable diapers. Prolonged wetness, lack of air circulation, chemical and dye cause irritations to the baby. Sodium polyacrylate (the super absorbent gel), and dioxin (a by-product of bleaching paper) are used to prepare the disposable diapers. Sodium polyacrylate has been linked in the past to toxic shock syndrome, allergic reactions and is very harmful and potentially lethal to pets. Dioxin is known to cause damage to the central nervous system, kidneys, and liver.

Saying "yes" to "hand me downs": Handing down baby clothes is a very old and true practice. It is a huge cost savings. Hand-me-down baby clothes, or "used" baby cloth-

ing need not be a dirty word. Without wallet shrinking the wardrobe grows very quickly. By accepting "previously enjoyed" clothing again, a parent can serve as the pebble in the pond. "Hand me Downs" is a basic principle of sustainable development.

Using organic products in the home: "Simple green" is good for the environment since pristine time. For an organic lifestyle of a baby the parent will love organic resources for switching to a greener way of life. The organic cosmetics and natural skin care will be free from parabens, SLS, synthetic fra-

grance and mineral oil or propylene glycol.

Organic baby foods: Before weaning, it is essential to know that there are no chemicals like fertilizer or pesticide residues in the food. As your baby grows and you begin to wean, go ahead and introduce organic baby goods. Organic baby food will be prepared from naturally good ingredients grown without chemical pesticides, nitrates, growth hormones or other unwanted extras and the meals will be produced without artificial additives, or processing chemicals. For growing infant or toddler the foods

will be free from salt, preservatives, gluten, dairy, additives, sugars and/or fillers.

Organic toys: Organic toys are made from stuffed animal, wood and toxic free pure fabrics (cotton). Organic toys help a child's imagination flourish. The fabrics will be colourful but not be dyed. This is achieved simply by using fibers from naturally occurring brown, green or white varieties of the cotton plant, thereby producing coloured fabric without using any dyes. Low-impact "reactive", safe and environmentally-friendly dyes may be used. Harmful chemicals like formaldehydes cannot be used during finishing process to give a material a soft or shiny quality.

Organic baby bedding: Baby bedding should be eco-friendly. Organic crib mattresses on soft bamboo sheets can bring bundle of joys for the little angels. Organic pads and blankets create green environment daily for the green baby. To protect your organic crib mattress, organic wool puddle pad can be used directly over the crib mattress. Wool is highly absorbent and provides the best natural protection without resorting to a plastic barrier.

Organic sippy cup: Non-leaching, safe sippy cup made by the stainless steel alternative to plastic can be used for the green baby. They are odour free and have no metal like taste. Plastic/polycarbonate bottles

leach bisphenol-A (BPA), a chemical that mimics the hormone estrogen, and can cause chromosomal abnormalities.

Green painting: Any renovation of home should be avoided. Lead containing paint is very harmful for the baby. For the decoration of the new nursery plant-based paints with low fumes can be used. Solvents and fume-emitting adhesives are strictly prohibited in the baby nursery.

Making our child a part of the recycling process: As the child begins to walk and becomes more mobile, we should train them to place "trash" in its appropriate place. By teaching the first word "recycle," we can be the proud green parents.

Setting the green examples: The parents should tell and cite green examples like a mountain lion having all organic diet will win over an alligator in a fight. Let our kiddos see we buy organic, cook organic, recycle, reduce, re-use and enjoy the fruits of being eco-friendly by enjoying the great outdoors.

Nature conservation: Unless and until we all are involved in the nature conservation, beautiful destinations may not be here for our green child to enjoy.

The writer, a biodiversity specialist, is posted as UNO, Mongla (mizan_perj@yahoo.com). The article is dedicated to his newborn son, Nuhad Nudrat.



A green baby (Nuhad Nudrat) is on an organic bed made of animal hair and skin