Containing river erosion for poverty reduction

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It is imperative to control river erosion by application of effective modern technology. The engineers might opine that it would be costly. As a layman I would suggest that it is necessary to incur cost in order to have permanent solution instead of wasting money every year on fabrication and placing of cement blocks which are generally washed away.

IN the current national budget of Bangladesh 56 per cent revenue has been allocated for poverty reduction. Steps have been taken for implementation of the PRSP , but river erosion which is one of the major factors responsible for appreciation of poverty seemingly has not been tagged up in the budget . Enough money has not been allocated for stemming river erosion. Hence reduction of poverty on one side cannot be successful if germination of poverty is not checked on the other. Poverty arising out of river erosion is like a cycle which revolves round the year. The major rivers viz. Padma, Jamuna, Meghna, their tributaries and other rivers overflow each year and gorge the banks. Croplands, homesteads, schools, markets and roads get swollen in the rivers every year.

Amount of loss

According to a survey an estimated 5 per cent of the floodplains disappear in the stream of rivers and one million people directly or indirectly become victims of which 300,000 homeless people take shelter on embankment, roads, khas lands and the remaining make their ways into towns and cities. Yearly financial loss due to river erosion is about Tk 3,500 crore in absolute terms, but in real terms if cumulative losses of crops, private and public properties are taken into account, the loss would amount to a greater sum , say Tk 4000 crore which is almost 7 per cent of revenue income in the national budget. This is a national loss that must be reduced and ultimately mitigated , otherwise steps towards poverty reduction may not be successful even in 50 years.

Silent but dreadful

River erosion renders the entire family homeless and penniless .Those who had all the means for food and livelihood become landless overnight. People living on the river banks get up one bad morning and see that half of their homestead has been gorged by the river, and they are compelled to abandon the remaining. Flood, cyclone, tornado appear with lot of noise and devastation that can be seen so that rescuers are made to come up with help , but river erosion takes its toll silently.

Prevention is urgent

It is indeed difficult to prevent erosion of the rivers that are so many. Water Development Board (PDB) has almost failed to control it most probably because of ineffective method. PDB has so far used concrete blocks placed on the banks to stop erosion . But according to an expert if the blocks are not of required size and strength it will be just waste compared to dreadful strength of the river current and waves that cut bank not along the surface but much below where no concrete block is placed. Most often we hear that blocks have washed away during rainy season. More durable and effective blocks or walls should be built or placed to stop the current and waves from striking deep in the banks. The method may require huge money, but it would be useful to spend at least Tk 2,000 crore in order to prevent a loss of Tk 4,000 crore every year affecting the lives of 1,000,000 people.

The objective of reduction of poverty cannot be achieved if germination of poverty is allowed through river erosion. It would , therefore ,be necessary to allocate enough money in the budget as ADP or specific projects. During the first few years allocation of more funds may be necessary but the need will gradually diminish ending in no fresh allocation except maintenance of the old ones. PDB has an accumulated bad name for alleged indulgence in corruption and graft in fabricating the concrete blocks through contractors. Hasty payment of bills before end of the financial year even by partial placing of the given number of blocks in the banks during rainy season seems to be a credible allegation. Because the blocks cannot be counted while under water. PDB's 'work' in raising soil embankments and eventual leakage of the same has aroused public anger and interception at many places due to which corruption has reduced to some extent in those places. So the local people will have to be vigilant and intercept acts of graft whenever detected.

Rehabilitation of the homeless

Though it is necessary to provide the million victims of river erosion food and makeshift shelters initially , they may not afford to live in the polythene tents for long .The victims have to be allocated a plot of land for raising homestead, soft loan for earning livelihood etc. There are hundreds of thousands of khas land plots part of which have been occupied illegally by the elements related to power that be or otherwise powerful. Those lands need to be recovered and allocated to the victims. The ministries of relief and rehabilitation and land have a great role to play in this regard. The government alone may not meet this big need of the victims , the NGO's and the richer class of the society may also come forward to mitigate this suffering. It is also important to see that the new lands that accrue on the riverbed by accumulation of the silts is protected by the government for the victims.

Conclusion

If the data given above are analysed and reviewed it would be realised how disastrous river erosion is. The process of river erosion is very quick while that of accumulation of silts and accretion of new land is very slow. Moreover these lands fall in the hands of the illegal occupants most of the times resulting in deprivation of the right of the real victims and the government as well. Consequently poverty of erosion victims is aggravated every year . So if the process is allowed to continue , poverty will never be reduced in the country. It is, therefore, imperative to control river erosion by application of effective modern technology, not by throwing cement blocks on the banks in a haphazard way. The engineers might opine that it would be costly. As a layman I would suggest that it is necessary to incur cost in order to have permanent solution instead of wasting money every year on fabrication and placing of cement blocks which are generally washed away. By applying effective modern technology, even if it is costly, at one stage it would be observed that river erosion has stopped totally.

Hence it is urgent to treat river erosion as a national calamity breeding poverty and steps should be taken to control it in order to reduce poverty. If river erosion is not controlled poverty will never be reduced.

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Greener computers

The nine country survey, carried out earlier this year, found that from half to three-quarters of computer users say that they would be willing to pay extra for an environmentally friendly computer. Every year, hundreds of thousands of old computers and mobile phones containing toxic chemicals are dumped in landfills or burned in smelters. Thousands more are exported, often illegally, from the industrialised countries, to Asia. There, workers at scrap yards, some of whom are children, are exposed to a cocktail of toxic chemicals and poisons. This is the dark side of a trend for cheaper, more disposable electronics.

DELL has become the latest company to promise to remove the worst toxic chemicals from its products, closely following the move of its rival HP. Both companies have been pressured to make their products greener and help tackle the growing mountain of toxic e-waste.

Dell made the announcement with a pledge to phase out the use of two key groups of chemicals known to be hazardous to the environment: all types of brominated flame retardants (BFRs) and the plastic polyvinyl chlorine (PVC), by 2009. This follows its big rival Hewlett Packard (HP) changing its policy in March 2006.

Easy as Dell

HP, LGE, Nokia, Samsung, Sony and Sony Ericsson have already made commitments to eliminate the use of BFR's and PVC in the near future. However, a number of other companies including Acer, Apple, Fujitsu-Siemens, IBM, Lenovo, Panasonic, Siemens and Toshiba have so far failed to commit to similar measures. Motorola recently broke its promise to clean up.

But despite these small steps in the right direction by some companies it is clear that electronics users expect more. A survey conducted by Ipsos-MORI reveals that most people across nine countries say they would pay extra for a more environmentally friendly computer and that companies should be held responsible for dealing with their hazardous waste from PCs.

The nine country survey, carried out earlier this year, found that from half to three-quarters of computer users say that they would be willing to pay extra for an environmentally friendly computer. The amounts ranged from $59 in Germany, $118 in UK, $199 in China and a whopping $229 in Mexico.

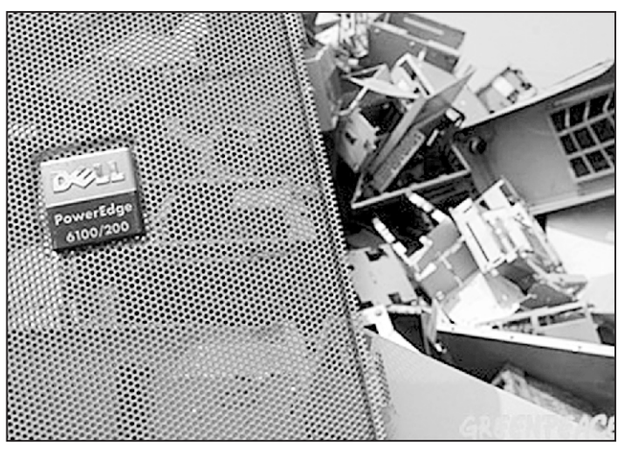
Toxic as hell

Every year, hundreds of thousands of old computers and mobile phones containing toxic chemicals are dumped in landfills or burned in smelters. Thousands more are exported, often illegally, from the Europe, US, Japan and other industrialised countries, to Asia. There, workers at scrap yards, some of whom are children, are exposed to a cocktail of toxic chemicals and poisons. This is the dark side of a trend for cheaper, more disposable electronics.

By removing the toxic chemicals, companies make it cleaner and easier to recycle their products. Companies that take responsibility for the whole lifecycle of their products from cradle to grave ensure that their products last longer and cause less pollution. Our vision for the industry is one that produces cleaner, longer lasting, more sustainable products that don't contribute to the growing tide of toxic, short-lived products currently being dumped in Asia.

The electronics is a fast moving, innovative industry that can respond quickly to users' wishes and new trends. But this years hottest gadget shouldn't end up being next years e-waste being taken apart by a Chinese child. Some companies are making positive moves and our survey shows that users want a cleaner industry and are willing to pay extra for it.

Will the industry follow this trend? ***-- Greenpeace News***



Arsenic in drinking water

Bangladesh perspective and global technological development

AAPO SAASK AND DR AZAHER ALI MOLLA

Providing absolutely pure drinking water from the tap has been the ambition of international water professionals for more than a century. Time has proven that in most places, it does not work. Although water professionals are reluctant to give up their dreams and still keep arguing that water from the tap is the best solution, international consumers are already choosing another path. It goes without saying that to be accepted, these solutions must have low life cycle costs, be technically robust, reliable, easy to maintain, socially acceptable and, above all, affordable.

IN Bangladesh, arsenic contamination of ground water was first detected in 1993 by the Department of Public Health Engineering (DPHE) in Chapai Nawabganj district (Barugharia Union, Sadar Upazila). The main source of contaminated water is shallow tube-wells. It is estimated that Bangladesh now has 8 to 12 million shallow tube-wells. Reportedly, by 1997, 80 percent of the population had access to 'safe' drinking water. A large volume of the ground water -- the source of drinking water for about 75 percent of the -- population has been severely contaminated by arsenic. By early 1998, a total of 8,065 tube-well water samples from 60 out of the 64 districts of the country were tested for the presence of arsenic using field test kits and atomic absorption spectrophotometer. The highest reported concentration of arsenic in drinking water was found as 4730 ppb, which is also the highest in the world.

It is also estimated that more than 20 million people are potentially exposed to arsenic poisoning. The National Institute of Preventive and Social Medicine (NIPSOM) found in a survey at Rajarampur village of Nawabganj district in 1996-97, that 29 percent of the wells were contaminated above 50 ppb. Also, in 1996-97 Dhaka Community Hospital (DCH) and School of Environmental Studies (SOES) found that 91 percent of the 265 tube-wells tested contained greater than 50 ppb of arsenic in Samta village under Jessore district. In 41 districts, the arsenic contents exceeded the 0.05 mg/L, maximum permissible limits recommended by the World Health Organization (WHO).

The health effects that result from the ingestion of arsenic contaminated drinking water manifest themselves gradually after a long latent period (5-15 years). Arsenic can produce serious health hazards if ingested in toxic amount. Probable effects include skin lesion (melanosis, keratosis, and skin cancer), diabetes mellitus, chronic bronchitis, hypertension, cirrhosis of liver, peripheral neuropathy and cancer. In fact, arsenic may have a negative impact on every organ in the body. Hyper-pigmentation, depigmentation and keratosis are the commonest forms of skin lesions attributed to arsenic poisoning. The shortest period described in the literature (with high exposure) is 2.5 years. From the nutritional and metabolic point of view arsenic is likely to adversely affect human nutrition.

Apart from health and nutritional damage caused by chronic arsenicosis, its social and economic consequences are also crucial. Estimated economic loss may reflect in victims' households or community as a whole. Arsenicosis results in compromised loss of working hours/days and loss of wage among the victimised adult members. Also, it affects on household economy and ultimately decreases the quality of life. Little is known on the economic burden and total financial loss in patients' households.

Global technological development

Providing absolutely pure drinking water from the tap has been the ambition of international water professionals for more than a century. Time has proven that in most places, it does not work. Although water professionals are reluctant to give up their dreams and still keep arguing that water from the tap is the best solution, international consumers are already choosing another path.

Those who can afford it buy bottled water or they buy special purifiers for purifying tap or well water before drinking. Also, in Bangladesh the long-term solution for drinking water -- whether well or tap -- will be bottled water and home water purifiers according to consumer's choice.

It goes without saying that to be accepted, these solutions must have low life cycle costs, be technically robust, reliable, easy to maintain, socially acceptable and, above all, affordable.

Here is a proposal on how overcoming the curse of arsenic in some areas of the country could be turned into a blessing for the entire country.

Distributed utilities: What is proposed by Scarab Development is that, waste heat from small power plants that run on bio-gas is used to purify water by low temperature distribution. Scarab's equipment is state-of-the art membrane distillation technology that is especially tuned to be maintenance free.

The plant is only meant to be used to make perfect food grade water. Distribution will be done in containers of convenient size -- 1.5 or 4 liters. Except for initial investment, the water will be virtually free since it runs on waste heat from the engine of the power pant it is being located at.

As an example, in this way a power plant may deliver 1 MW of electricity and 100 M3 water per day. Additional water output can, if necessary, be obtained by adding solar panels to the system or bio-fuel heaters.

Ecological sustainability: This type of distributed energy and water production will eliminate the need of huge dams and other environmental disruptions. And it will avoid huge investment in transmission infrastructures and the cost of their up-keep.

Neither the water treatment nor the energy production will create waste and modern engines create minimal air-pollution. And they will not contribute to global warming. Rather, both process utilities waste and return whatever residue to nature's cycle, even minerals to the soil, which will stop the present depletion of agricultural lands.

After the investment is made, the running costs are minimal. The total running input for the system, except maintenance, will be human and agricultural waste. According to a study made by the Swedish aid agency Sida, the world-wide energy content of agricultural waste approximately equals the energy content of annually used petro-chemical fuels.

Social sustainability: A distributed utility of this kind will not only reduce poisoning from arsenic. It will contribute two of the most important factors for development -- electricity and clean water. In addition, it will free the human work now being used for fetching and treating water.

Commercial sustainability: Probably the most important aspect of this solution is that it will empower all the people that are beneficiaries of the systems and support their move from dependency to economic self-sufficiency. Specifically it will, of course, benefit the people who are directly involved in the commercial implementation and operation of the equipment.

Small is beautiful: Distributed utilities could vary very much in size, from a few hundred kW of electricity production and a few thousand liters of clean water per day to several MW of electricity and hundreds, may be thousands, of cubic meters of water per day. What they all have in common is that the electricity is delivered through a local grid and the drinking water is delivered in bottles and containers -- locally or regionally.

Cost: Assuming a rather large plant with an electrical capacity of 1 MW, 24000 kWh electricity and approximately 100,000 liters of water is produced per day.

The capital cost for such a plant will be approximately 2 million US$ and it should be written off in five years, although the real life will be much longer, more than ten for the power and water equipment, perhaps less for the bottling equipment. The capital cost for this high-grade water produced is therefore almost negligible.

Another capital cost would appear if there is no local grid to connect to. Then one would have to build a local grid. Also assuming that the water is not bought by a retailer, there would have to be delivery crucks for distribution to retailers or directly to end users. These cost fall outside of this calculation and would have to be added to the final price. However, these costs are not wasted. Just like the costs for producing electricity and clean water, they contribute to the over-all economic development of the region and the country.

The bio waste for the engine will initially have a collection cost and later when the use of bio-fuels is more common it will have a market price. A probable future market price should be used in the feasibility.

The power equipment and the water treatment need very little maintenance and service whereas the bottling equipment needs more. We can assume an average of a few percent of capital cost annually. Since the equipment is largely self-regulating, the labour cost is not high, there are virtually no consumables for the water treatment equipment. For the power plant, apart from bio-fuel, running costs are also small. For the bottling, the cost of bottles can be calculated on non-returnable bottles although in most cases bottles would be reused.

Total cost including depreciation, interest and operation would be less than 1 million US$ per year. A system ten times smaller in size (2400 kWh electricity and 10,000 liters of water per day) would have an annual total cost of approximately US$ 200,000. These will all be very profitable investment both in commercial and human terms.

Income: *Electricity*: In many of the target areas there is no electricity or not sufficient electricity. Many of the people may not be able to afford electricity. However, in the long run everybody should have electricity. Everybody would benefit from electricity and will eventually be able to pay for electricity.

To calculate the potential sales of electricity is the most important part of the feasibility plan for each project and will determine what capacity of equipment is included. If there is a small market for electricity at the actual site, the plant will be small and the system may produce less water than desired, but water production can be augmented by solar power or heating from biomass.

Water: The water produced will be completely free from arsenic but it will also be free from any other (known and unknown) contaminants. This will be a strong marketing point in an area that is afflicted by arsenic, but also in any other market.

Small plants will sell their water locally to villagers in the neighbourhood. Larger will also sell their water to neighbouring towns. In very destitute areas we would expect that the water be initially purchased for the villagers by NGOs and possibly by international aid agencies. However, no project should be financed unless it has a clear long-term commercial viability.

Site-specific feasibility: Although there would be standard models for the operations, each unit would have to be evaluated in its own context. A bankable feasibility study will have to be prepared by the aspiring entrepreneur. Scarab Development will of course assist with figures and calculations but in the end. The viability of the project will have to be the responsibility of the person, company, term or community that runs it.

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Zinc fertilizer for more crops and less harm to soil

To make zinc fertilizer popular agriculturists and others concerned should take necessary steps to publicise its quality and effectiveness; training facilities should be provided to the extension workers of agricultural department; businessmen should be encouraged to import it; NGOs should be involved to disseminate information on its importance and utility.

KBD MD SHAHIDUL ISLAM

BANGLADESH is an agricultural country. But the cultivable land is decreasing day by day as the population is constantly increasing. Under this circumstance, there is no alternative but to use land scientifically and efficiently, also keeping in mind the conservation of environment.

Agricultural land was very fertile at the beginning. There was no necessity to use fertilizer. But the fertility of soil gradually decreases due to constant and intense cultivation of crops. So the agriculturists, researchers, extension workers felt to use fertilizers. Out of sixteen essential elements for plant mostly Nitrogen (N), Phosphorus (P) and Potassium (K) are used as Urea, Triple Super Phosphate (TSP) and Murate of Potash. The fertility and productivity of soil decreases because of unbalanced use of chemical fertilizer and intensification of cultivation. It may be noted that now the total production of cereal crops has increased more than three times compared to the past decade. The government has taken initiative to set up soil testing laboratory in each upazila. It will bring little result if only major elements are applied to the soil, so it is very essential to apply micro elements like, Zinc, Boron, Manganese, Molydbenum and Copper. Among the micro-elements zinc and boron are becoming popular to the farmers. But the farmers are now at risk for want of Zn. However, there are some problems too, and that have to be overcome to yield full benefit. The problems and prospects of Zn is discussed below:-

Zinc deficiency symptoms: Front portion of young leaves become whitish in colour; older leaves become brownish; the size of the leaves become smaller and the edge of the leaves turn crinkled; uniform growth of plants is not obtained.

Functions of zinc: It is very essential that the cereal crop plants attain normal growth and development, specially rice, wheat, maize, sugarcane, lentil, fruits and vegetables. Zinc acts in formulation of proteins and enhances growth of hormones.

Present status of zinc utilisation: One third area of cultivatable land in Bangladesh has zinc deficiency specially in the northern and southeastern districts like Panchagar, Thakurgaon, Dinajpur, Rajshahi, Pabna, Comilla and some parts of Chandpur. The total area of zinc deficiency is about 39,35,855 hectare. Crops production is being hampered seriously because a vast area has zinc deficiency. To solve this problem two types of zinc sulphates are usually used. It is less soluble in water and for a few years remain as such. Zn sulphate breaks down into zinc ion and sulphate ion in the presence of water. Later on zinc mixes with TSP and becomes unavailable to the plant. On the other hand zinc sulphate mixes with soil and makes it acidic which to an extent degrades its quality.

Some disadvantages: When it mixes with the TSP and DAP the plant cannot take either zinc or TSP, because mixing with TSP, zinc forms a complex compound diminishing its availability to the plant. It increases acidity of the soil which affects the environment and cultivation of other crops is also hampered. Percentage of zinc in the compound also decreases in the process to the disadvantage of farmers.

Zinc fertilizer in developed countries: Many countries of the world have taken up appropriate measures and scientific use of zinc fertilizer after doing necessary research on it. Ciba of Switzerland has been working for the last 20 years on soil based industry and discovered such a zinc which is known as EDTA chelated zinc. It can be used by mixing with TSP. The good news is that in this fertilizer ion is kept in a ready-made form which the plant can take directly and there is no sulphate. As a result it does not create acidity.

What is EDTA chelated zinc? Chelated zinc is a special type of Zn developed through high technology which is readily taken by the plants. In other words it is covered by EDTA coat which is available to the plant in presence of water and it does not react with other materials. It reduces toxicity because there is no sulphate; it is friendly to the environment; it does not mix with other products because it has EDTA coating; its storage and transportation cost is less; it increases soil fertility and productivity.

Measures should be taken: It was not given importance before because the necessity of microelements was felt gradually and now in some areas without it corps cannot be cultivated. So agriculturists, soil scientists and others concerned have come forward to look into this matter seriously. It is a matter of sorrow that though there is a government circular to use this fertilizer no one including scientists, researchers, extension workers or related businessmen have taken initiative to import or market this product. In our own interest it is necessary to have knowledge about its quality, application and uses. Agriculturists, researchers, businessmen, NGO workers have to come forward to make it happen. We may seek cooperation from all strata of people. Now it is the age of information. So, we should go forward according to the new information, otherwise we may lay behind and sink into scarcity of food, malnutrition and poverty, not to speak of the detrimental effect to the environment.

Conclusion: To make up the scarcity of zinc fertilizer in Bangladesh we may use chelated zinc. To make it popular the following steps should be taken: Agriculturists and others concerned should take necessary steps to publicise its quality and effectiveness; training facilities should be provided to the extension workers of agricultural department; businessmen should be encouraged to import it; NGOs should be involved to disseminate information on its importance and utility.

Besides that mass communication and government publicity department should come forward to popularise this fertilizer. With all efforts from all levels the international standard chelated zinc could be introduced and the country would be self sufficient in food by checking deterioration of soil quality and environment.

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