

## What can Bangladesh do to combat climate change?

DR. ABDULLAH SHIBLI

I lend my voice of support to Prof. Shairul Mashreque's call for combating climate change (CCC) published recently in The Daily Star ("Green beckoning", July 15, 2009). Unfortunately, the process of CCC is not as easy as it might appear. And, while the global community now recognises the importance and the urgency of CCC, we need to realize that even if we diligently implement all the protocols and embrace all the best practices available to control emission of greenhouse gases, the results on the earth's temperature will not be significant for at least two or three more decades. I might also add that in spite of the agreements reached at the recently concluded G-8 meeting in Italy, and the actions taken by the USA prior to that, a reduction of global warming by 1 or 2 degrees will remain an elusive goal.

### Two major obstacles

What is the reason for such pessimistic views about the prospects of CCC? Very briefly, my cautious approach emanates from the two major dilemmas ("tensions") we are facing. The first relates to the divergent interests of the developed and developing countries. The developed countries are pushing for a time-bound reduction in carbon emissions that is applicable to all countries. The developing countries, including two of the largest polluters India and China, on the other hand, are not too eager to take on a larger burden to curtail carbon emissions. And, I do not fault them since they have a strong case: it is universally acknowledged that the developing countries were not responsible for the existing level of carbon in the earth's environment. In per capita terms, these two countries are not even in the list of top 10 emitters of Greenhouse Gas (GHG). The seriousness of the rift in the two camps can be fathomed from the personal intervention of the US Secretary of State Hillary Clinton

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who at the Non-Aligned Movement conference appealed to India to pursue a low carbon growth, and repeated the call during her trip to India.

The second dilemma relates to the cost of carbon dioxide (CO<sub>2</sub>) reduction, and the higher cost of cleaner technology. It is now well established that most clean technologies are more costly than their traditional counterpart. Electric power costs more to produce when cleaner fuel or abatement technology is used. Cleaner cars cost more and so do cleaner electronic goods. And here comes the paradox: while consumers prefer cleaner technology, they do not want to pay more for it. Various consumer surveys in developing countries as well as developed countries reveal a preference for clean technology, whether in durable or consumer goods. However, the preference for goods produced with cleaner technology dropped drastically when the respondents were shown the price of these "clean" products.

### Cost and benefits

The development and adoption of greener technology is expensive. "Who will pay for it?" is the trillion-dollar question. This issue is at the heart of the tug of war played out by the various countries. Let us take the case of automobiles. Toyota makes both internal combustion and hybrid cars. The latter uses less fuel and emits less CO<sub>2</sub> per gallon of fuel used. However, hybrid cars cost more, which the owner can recoup in 3 to 5 years depending on miles driven and the cost of fuel. This, following an

approach originally elucidated by Prof. Amartya Sen, spells out the cost and benefit of cleaner technology in a time horizon. It also brings to the fore the key issue in the current debate: Will the EU or G8 countries be willing to provide financial incentives to hybrid users in developing countries?

### Possible leadership role

While the G8 countries and the developing countries try to sort out the conflicting issues and to strike a balance in sharing the burden of CCC, Bangladesh can in the interim play a key role at various international forums. Bangladesh, which is expected to bear the brunt of the effects of global warming, can play a major role in the international debate on CCC. We can and should speak out at the UN summit, Copenhagen summit and other

global forums, but our views will be heard and respected if we lead the way in reducing our own carbon footprint by adopting innovating approaches to CCC.

- What can Bangladesh do to show its commitment to CCC? In addition to the ones that BAPA, BEN and other environmental organizations have proposed, there are a number of other steps we can take individually and collectively, including:
- A comprehensive energy policy review, covering support for solar and other renewable energy;
- A full assessment of our emissions and cost of adoption of cleaner technology (example of how to generate electricity);
- Involvement of the business community and active participation of the community in the 3C Initiative;
- Enhanced national awareness of the impact of deforestation, open burning in agricultural fields and landfills, and agricultural soil management practices;
- National debate on the importance and adoption of a roadmap to low-emitting society.

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We may also experience a longer drought.

## Needed a community-led adaptation

DR. MAHMUDUL ISLAM

BANGLADESH is one of the most vulnerable countries in the world to climate change impacts. The major impacts of climate change are, the high frequency of natural disasters (cyclones, floods and tidal surge), sea-level rise and salinity increases in soil and water, which have direct and indirect impacts on reducing the agricultural land or their productivity and biodiversity. This means, climate change has direct impact on the livelihoods as well as food security of the inhabitants of the lowlying areas in the country.

Currently, almost 40 million people live in the coastal areas of Bangladesh. With the population of riverine areas included, the affected population would be half of the country's total. Loss of coastal land to the sea in this vulnerable zone is currently predicted to reach up to 3% by the 2030s, 6% in the 2050s and 13% by 2080. This is likely to generate a steady flow of displaced people. Besides, increase in salinity in soil and water already has significant impact on the livelihoods of the coastal people and consequently has resulted in a number of other more insidious problems in the area.

Natural, undisturbed coastlines can help to protect Bangladesh against the impacts of climate change because they act like a buffer, protecting inland areas against climate change impacts such as accelerated erosion, flooding, and damage from storm surge events. Coasts are dynamic and resilient systems, yet human induced changes reduce their natural adaptability and make them more vulnerable to the impacts of climate change. Some of the identified options to manage risks from climate change and adaptation to it are: large scale afforestation, multipurpose coastal and river embankments, planned disaster resilient shelters and community housing. These not only protect people from the impact of cyclone, tidal surge and flood but also provide options for alternative livelihoods.

In addition, investment into natural and local resource based livelihood patterns/options considering different agro-ecological zones, including developing the Sundarbans and Kuakata as tourism spots, developing diverse agricultural production (fruits, crops, livestock products, fish and forestry), preservation and processing industries will support their resilience. These options

can enhance the livelihood means of the people while providing structural support to those living in the areas. In line with the present government vision of "Digital Bangladesh", developing and strengthening transport and communication network will also increase the livelihood options in the climate change impact areas.

Much discussion in TV talk shows, national and regional workshops are taking place in the capital city of Dhaka as well as other cities to combat the climate change impacts. However, what is critical now is to move away from producing "paper and reports" towards investing human, material and financial resources on the issues at the places likely to come under climate change impact. Hence, climate change adaptation strategies, action plans urgently need to be fine-tuned and applied here.

Climate change has already impacted and will affect all areas of development work. This puts population, (particularly in coastal and riverine areas, at huge risk of becoming displaced. Hence comprehensive risk reduction plans (structural and non-structural disaster mitigation and climate change adaptation policies), preparedness plans and, accordingly, actions should get importance in the public planning and resource allocation processes. Comprehensive disaster management approaches hence need to be integrated into all existing programmes, projects and activities and also into future programmes.

Analyzing or assessing the community risks, and developing the risk reduction strategies/options are the priority tasks. Accordingly public service sectors should make their plans, programmes, projects, where both public and private resources need to be allocated to the communities at risk so that the end users (climate change affected people and communities) may secure their means of livelihood assets. Hence, bottom up planning to reduce the risk of people and accordingly public resource allocation can enhance their access to resources. Increased attention and funding to support disaster risk reduction and climate change adaptation initiatives would thus enable the communities to cope with the shocks and stresses and to sustain their livelihoods and remain on their land.

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## TIPAIMUKH DAM Impoundment, flow, and EIA

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THIS paper will mainly deal with probable Environmental Impact Assessment (EIA) as a result of construction of Tipaimukh Dam. In early nineties a study was undertaken by the government with experts to ascertain the relationship between release of water from the dam during floods and dry season with water levels in rivers in the lower riparian Bangladesh.

The Mathematical Model (MM) conducted between 1993 and 1995 has the following findings:

During floods, water level will decrease by 1.6m; in dry season (Feb) water level will increase about 4 times, to a depth of 1.7m and for dambreak Sylhet area will be flooded to a depth of 1.0m. The data and study date back nearly 16 years. Assumptions made at that time may need change/modification.

Analysis of impoundment and flows

High flow: The flood flow will need further analysis on the basis of new data to ascertain the magnitude of flood level. Flood level will rise rather than decrease.

Low flow: In February at Amalshid water flow will increase by over 4 times with increase in quantity by 60%

leading to rise of water level by 1.7m. It appears unrealistic; the study conducted some 16 years ago needs re-evaluation based on new data. Our surmise is, Water level will reduce.

Dambreak: Assumption in MM was unobstructed flow from the dam to Bangladesh. Sylhet Area will be flooded to a depth of 1.0m if there occurs a dam failure. In it there is no mention of the quantity for the area. It is stated that in this process a volume of 10x10<sup>9</sup>m<sup>3</sup> (10 billion m<sup>3</sup>) of water was involved, and flooded to a depth of 1m. Actual depth and area flooded will be larger as Tipaimukh reservoir holds a volume of 15x10<sup>9</sup>m<sup>3</sup> water.

Dambreak occurs for catastrophic hydrological events or severe earthquakes (both are natural events). Massive weight of 15x10<sup>9</sup>m<sup>3</sup> of water and weight of dam and other superstructures together about 2 crore tons may accentuate seismic acceleration and earthquake, causing tremendous pressure which combined with water and wind pressures may cause cracking to ultimate failure of the dam. The dam is situated in the seismically most active earthquake-prone zone in India where many catastrophic earthquakes occurred, including two of 8.5 in Richter scale. During dam failure a massive flood wave, a wall of water, would travel downstream to

Damages and deterioration of economy in all sectors and sub-sectors like agriculture, irrigation, water supply, fishery, and environment and industries must be identified and expressed in quantities in both physical and monetary terms and mitigation measures undertaken for correcting/ameliorating the damage and improving water level in channels, by sharing adequate water for irrigation, navigation, fishery etc.

reach Sylhet border in 48 hours or so.

### Adverse impacts and EIA

The adverse impacts are sad pervasive in almost all sectors and sub-sectors of economy and environment and some social issues.

It is learnt that India prepared an EIA which was terminating just at our border. As per international convention EIA should be prepared taking full cognisance of adverse impacts in lower riparian country. Damages to economy and environment that will be caused, should be identified and mitigation measures suggested and expressed in both physical and, more importantly, monetary terms. This is to identify who will bear the cost of mitigation of economic damages and losses and environmental decay and degradation etc. Conventionally as per environmental rule "polluters pay" the cost of cleaning, redressing, correcting and ameliorating the damages caused.

EIA study prepared by India

must be available to Bangladesh. Since Bangladesh is sadly excluded in their EIA, we need to prepare our own EIA for Surma-Kushyara-Meghna basins, singly or jointly with India.

### Low and high flow impacts

- Navigation will suffer -- industries will be affected.
- Pollution and environmental decay will be all pervasive due to low water in the whole river system where channels, haors and baors criss-cross in a magical maze.
- Agricultural crop production will be impeded for both high and low flow, causing economic loss and dependency to farm populace.
- Fishery and fishermen will be economically affected. For all dam projects fishery diminishes in rivers and fishermen lose jobs which pose a major concern for the people and the government.
- As the time will pass environmental pollution and degradation will turn worse, and in future, viciously it may be irreversible and beyond redemption.
- Slowly and surely cool and congenial environment will turn hotter and hostile, harbinger of a dreadful and apprehensive climate change in the whole Sylhet area.
- Massive damage to biodiversity, flora and fauna will occur, some facing extinction.
- Beneficial sediment for increasing soil fertility will be impeded as dam releases clear water.
- All dams in the world have adverse impacts upstream, at dam site and downstream areas. There is no dam in the world, free of adverse impacts. Larger the dam, harsher is the problem.

### Mitigation measures

- Damages caused by environmental degradation will be colossal, but for all damages

caused, mitigation measures must be worked out and listed and database. One will have to think how to repair the damage caused to almost all sectors of economy and bring some remedy and relief.

- All damages -- economic, environmental and social -- must be quantified and expressed in monetary terms and total cost involved will be presented to the authority with request to provide funds for correction and re-building.
- The norm in environmental rule such as "Polluters Pay", should be applied.
- With bi-lateral diplomacy tacitly the upper riparian may be asked/requested to pay or at least share the cost of mitigation measures. It is up to the government to find out alternative options like joint fund between the disputing parties.

### Concluding remarks

Impoundment and reservoir capacity: The reservoir has a capacity of 15 billion m<sup>3</sup> of water. Of this there will remain

a certain percent as dead storage. Storage is reserved for continuous release to flow over turbines to generate hydro-electricity and the water is allowed to flow downstream. We must know the rate of flow over turbines and its combined release in downstream channel. There will be mandatory continuous release as ecological flow. Agreed equitable and fair share that will be allowed to flow to Bangladesh must be negotiated now and settled.

Low flow: For low season average level, further study is needed on getting data of release from dam. Share of Barak waters should be negotiated and regularly monitored as that agreed share would reach Bangladesh, not like as it happened with the Ganges for Farakka. For low flow the area will be affected by drought and desertification.

High flow: After the reservoir is filled to capacity with impoundment of 15 billion m<sup>3</sup> of water, the entire excess flow will pass downstream through the spillways and outlets with all gates open for ensuring safety of the dam. Entire flow from the turbines will flow unobstructed to Bangladesh.

Dambreak or dam failure: For 1.0m depth of flood, the impoundment involved was stated to be 10 billion m<sup>3</sup>.

Since the capacity of the dam is 15 billion m<sup>3</sup> and spilled water will finally exit through the border of Bangladesh the wall of water from dam will submerge the area to a larger depth.

EIA: Since EIA conducted by India just stopped short of Bangladesh border, EIA study in Bangladesh for adverse impacts of the dam must be conducted.

Damages and deterioration of economy in all sectors and sub-sectors like agriculture, irrigation, water supply, water-logging, fishery, pollution and environment and industries must be identified and expressed in quantities in both physical and monetary terms and mitigation measures undertaken for correcting/ameliorating the damage and improving water level in channels, by sharing adequate water for irrigation, navigation, fishery etc. and combating pollution and environmental degradation, taking care of aquatic flora and fauna, particularly fishery, local and large industries like gas, power, fertilizer and so on. In all dam projects biodiversity becomes the worst victim around the world.

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## Planting the right kind of trees

ABDUS SATTAR MOLLA

THE term "sustainable development" seems to have reached a stage of sustainability after having been used for long. Sustainability is a word most suited, perhaps, for describing an ecosystem constituted of biota like plants, animals and microbes living in any area of the earth. But unfortunately, we -- the most destructive animal species -- did not let ecosystem thrive sustainably, rather we caused extinction of much of the biodiversity in the world, resulting in large-scale environmental degradation.

Bangladesh tries to reforest its barren land, but there are some areas where trees are still being cut down. The government inaugurates the tree plantation season in June every year, and it continues till September. Tree fairs are arranged all over the country; thus tree plantation receives due importance. But what does not receive due attention

is the importance of choosing the right kind of trees that can contribute both to plant-biodiversity and harbour plant-dependent biota including animals. To help provide food and shelter to the existing animal species, polyculture of indigenous plant species should be the way.

Does our reforestation comply with indigenous polyculture? I don't think it is. I have seen patches of land in Madhupur and Bhawal forests where only lines of eucalyptus or acacia trees were planted. Such monoculture forestry is seen to be the trend also in the deforested areas in Chittagong.

We have also committed similar mistakes in selection while planting saplings by the sides of highways and city roads (and also road islands). We make acacia (that rarely has a straight trunk) jungles by the sides of national highways, and eucalyptus (which contributes to dryness through transpiring water) saplings are



Acacia monoculture which we wrongly do

still planted on both sides of roads.

The forest department seems to be counting the total forested area, which is around 8%-9% but should be about 25%. Only counting will not replenish the natural ecosystem, rather the forests should contain many types of plant species, especially indigenous ones so that animal species specifically dependent on certain plants can survive. Due to growing population, Bangladesh does not have enough scope to regain about 25% as forested area, so we

have to choose the best kinds of trees for planting.

The following kinds of trees should be planted:

- Trees having fruit-bearing and timber quality together.
- Trees having appreciable timber value.
- Trees that grow fast.
- Trees that spread over large areas.
- Trees that produce fibre and/or cotton.
- Trees having medicinal value.

There are many trees famous for both timber and fruits, like blackberry,



Mixed forest that we can recreate through polyculture.

jackfruit, mango and palmyra palm (tal). Blackberry is famous for its tall straight trunk. Jackfruit is our national fruit and the tree, though not very tall, has timber of very high quality. Some mango trees by the roadsides can provide fruits as well as shade. Palmyra palms are a source of fruits, sugar and hard wood, and a row of them along the sides of roads can also prevent vehicles from going off the road.

Trees grown mainly for timber are wood-oil tree (gorjan), teak (segun), red-

wood (shishu), Indian lilac (jarul), mast tree (debdaru) etc. Debdaru and jarul usually grow 10-15 meters high, while gorjan and segun may reach even 30-40 meters. Our indigenous silk flower (shilkoroi) yields good timber as well.

Fast growing trees like rain tree (rendi koro) and mahogany (mahogoni) are found all over the country and rain tree alone provides the bulk of timber for low-cost furniture. Another fast growing tree, almond, has a tall trunk and is famous for its medicinal value.

Banyan (bot) is, perhaps, the largest and most spread-out tree in the world. If grown to its proper size a banyan tree can provide extensive shade. The small fruits not edible for humans, but are food for many birds, and the bushy top is an excellent niche for nesting. So banyan is very bird-friendly.

Red silk cotton tree (shimul) is becoming rare in Bangladesh. Its timber is of low quality, but its fruit produces silk cotton that is now scarce and much more valuable than other cotton varieties. Therefore, planting some saplings of this species is of utmost importance, both for the sustenance of this plant species and for the pillow-filling cotton.

We were rich in medicinal plants just few decades back. Tree varieties (many are shrubs or herbs) of the medicinal plants are arjun, bahera and the well-known neem. These plants can be grown by the sides of all the highways. The forests can also have a mixture of these trees, and some areas can be sorted out in every village and moholla to establish medicinal plant gardens.

Every attempt at reforestation should aim at establishing polyculture forests consisting of the best kinds of trees. The highways can have 3-4 rows of trees on either side. To contain more trees of the right kind, saplings should be planted following a good plan. The lowest ebb of the roadside may have jarul saplings along with some babla and hijal. These plants can thrive in water. Aam, mahogoni, gorjan, debdaru, rendi koro, jaam etc. may be planted in the middle. Kathal, shimul, segun, redwood etc. cannot withstand water, so they should be planted along the highest ebb. Besides, a few banyan trees and medicinal plants can be planted at some distance along the highways.

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