

Climate Change, Global Commons and Corruption in the context of Sundarban Mangrove Forest in Bangladesh

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Abstract

Global commons are the most threatened objects in climate change scenario. The nature of these commons itself is vulnerable in the world of unclear property rights, externalities and different forms of claims. Sunderban, the world's largest mangrove forest is in peril due to corrupt practice and its consequences are alarming especially in the realm of climate change. The aim of this paper is to pose the concern that Sunderban as a global commons and its deterioration due to malpractice in using resource is a global loss. In exposing the loss the paper aims to highlight the corruption issue and its true loss in terms of total economic values. The importance of Sundarban is immense in terms of carbon sink as well as "bio-shield" against cyclone and high tidal surges. Moreover, destruction of the forest will bring havoc to ecology and unexplored and unutilized marine resources of the surrounding water system. The total valuation shows that the damaged monetized in normal accounting process is much less than the actual damaged enumerated using total valuation approach. Policy conclusion is drawn strengthening the norms of reducing corrupt practices and better management approach.

Keywords: *Global Commons Climate Change Mangrove Forest Total Economic Value Corruption*

INTRODUCTION

Global commons always played a vital role to ecology and biological life of mankind. However, these roles now a days are not hassle free. Continuous pressure from anthropogenic activities together with atmospheric changes making the role rather cumbersome, leading to sporadic and ruthless natural catastrophe. Sunderban, the world largest mangrove forest is a world asset and its role in protecting human life and the life of many other species is above question. However, being located in one of the poorest regions of the world its existence is at stake. It's being exploited and plundered ruthlessly for decades and the recent speed of human encroachment is alarmingly posing a great threat to its further existence. The major threat unfortunately is mismanagement and short term gain targeted policies by the administration.

It is now realized that Bangladesh is one of the countries that are most critically vulnerable to the potentially devastating impact of climate change.¹ The country has been traditionally ravaged by a range of natural disasters like cyclones, floods and draughts. In recent years the severity, intensity and unpredictability of such disasters have significantly increased, which experts have linked to the climate change.² The impact of natural disasters is further aggravated by man-made menace of pervasive

¹ Mortality Risk Index 2009.

² Department of Environment, GOB, 'Climate change and Bangladesh', September 2007.

corruption³. This paper brings into focus the impact of climate change and corruption on the Sundarban, the largest contiguous mangrove forest in the world with rich biodiversity, situated in the south-west coast of Bangladesh emphasising on the Total Economic Value approach.

ECONOMIC AND ECOLOGICAL IMPORTANCE OF SUNDARBAN

Sundarban is a World Heritage Site. It constitutes 51% of the total reserved forest estate of Bangladesh, and contributes about 41% of total forest revenue and accounts for about 45% of all timber and fuel wood output of the country.⁴ The Sundarban serves the 'bio-shields' against the cyclones (tropical storms) and high tidal surges. It provides protection against coastal erosion and damage. It stabilizes the coastal land by trapping sediments. Moreover, the Sundarban could be a large carbon sink to mitigate global warming and offset the greenhouse gas emissions. The belt of Sundarban mangroves is capable of absorbing 70-90 percent of the energy of a normal wave and 30-40 percent of the total force of a tsunami or cyclone-generated shock-waves before they hit the inhabited areas.⁵ About 3.5 million people depend directly or indirectly for their livelihood on Sundarban's resources.⁶ Destruction of the forest will not only affect the ecology but will also have far reaching impact on the national economy, and cause immense damage to the many unexplored and unutilized marine resources of the Bay of Bengal.

SUNDARBAN AND TOTAL ECONOMIC VALUE

Formally for capturing values of a forest, Total Economic Values are considered. Table below shows different section with their scopes of capturing values.

Table 1: Total Economic Value in the Context of Tropical Forests.

(1) Direct value	(2) Indirect value	(3) Option value	(4) Existence value
*Timber	*Nutrient cycling	*Future use as per direct and indirect values, e.g. future medicinal values of plant species	*Forests as objects of intrinsic value and as a gift of nature
*Non-timber products	*watershed protection		*Include cultural and heritage values.
*Recreation	*Air pollution reduction		
*Medicine	Micro-climate regulation		
*Plant genetics			
*Education			
*Human habitat			

³ According to the Corruption Perceptions Index (CPI) released by Transparency International, Bangladesh was ranked at the top of the list of countries where corruption perceived to highest in the world from 2001-5. In 2006, 2007 and 2008, it was ranked at the 3rd, 7th and 10th position respectively. See for more: www.ti-bangladesh.org, www.transparency.org

⁴ FAO, quoted in Saidur Rahman (undated). *Ecology and management of Sundarban: A Rich Biodiversity of the World's Largest Mangrove Ecosystem* [<http://srmilan.tripod.com>]

⁵ *The Daily Star*, Dhaka, 28 December 2007.

⁶ Department of Forests, Government of Bangladesh.

TOTAL ECONOMIC VALUES: CLIMATE CHANGE AND CORRUPTION

Indirect Values and Climate change

It is now an open fact that Bangladesh, especially the southern part of the country, off the coast of Bay of Bengal, is highly vulnerable to sea level rise because of global climate change. According to one estimate, a 45-cm sea level rise will inundate the 75% of the Sundarban, whereas a 1-m rise will inundate it completely. In the land-starved country, redistribution of species whose habitats will be affected by inundation may be impaired because migration, especially to the north, will be blocked by human settlements.⁷

Bangladesh is a disaster prone country and the climate change will increase the chance of this disaster further through inducing greater frequency and intensity of tropical cyclones originating from the Bay of Bengal. Apparently large areas of the Sundarban along the coast are expected to be inundated by sea water, which coupled with lower fresh water flow will in turn increase salinity in the region threatening the conservation of the Sundarban mangroves and regeneration and succession of the forest.⁸ The changing wave pattern will also increase coastal erosion. Salt water intrusion will alter the salinity regime in mangroves, changing the species composition. Loss of productivity, species and ecosystem is therefore widely feared. The freshwater loving Sundari is projected to decline or disappear entirely under climate change. Areas predominated with best quality standing timber offering dense canopy cover would be replaced by inferior quality tree or non-woody shrub species. Under such conditions vegetation canopy would become sparse and plant height would be reduced significantly. The degradation of forest quality might cause a gradual depletion of the rich diversity of the forest flora and fauna currently found in the Sundarban ecosystem.⁹ This alarming apprehension has been echoed by many writings including TI- report (unpublished). This paper has heavily drawn on that report especially for the corruption related part. However, the TI- report could not focus the issue in total economic value term which makes it inadequate. The present paper tries to mention some of the concepts of total economic valuation approach so that a clearer picture of damages can be exposed.

Direct values and Corruption¹⁰

Sundarban forest resources have also been highly vulnerable to deep and wide corruption, especially illegal logging of precious trees, the *Sundari* in particular. Illegal logging takes place with impunity thanks to collusion between business syndicates, corrupt forest officials and local administration. IT report discloses further that a section of local political leaders and in many cases journalists are also often

⁷ Intergovernmental Panel on Climate Change, 2001, *Climate Change 2001: Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the Third Assessment Report of the IPCC. Cambridge University Press, UK.

⁸ S. Huq, A. Rahman, M. Konate, Y. Sokona, and H. Reid, 2003, *Mainstreaming Adaptation to Climate Change in Least-Developed Countries (LDCs)*, International Institute for Environment and Development, <http://www.iied.org/pubs/pdf/full/9219IIED.pdf>

⁹ *Ibid.*

¹⁰ This section draws from, Transparency International Bangladesh, *Diagnostic study on Transparency & Accountability in Forest Conservation and Management: Problems and Way-out*, 2008.

allegedly engaged as beneficiaries. To carry out illegal logging usually groups of contracted labourers are engaged who use trawlers or engine boats with the connivance of these vested interests. They operate under the guise of carrying Nypa leaves by rafts which are in reality filled with illegal logs covered by the leaves. It has been estimated that only in this process logs worth Tk 60 million¹¹ are smuggled out annually.

The largest share of illegal logs is, however, smuggled out by the fishermen and the *bawalis* (authorized collectors of Nypa leaves). Almost every fishing boat collects excess firewood violating rules. *Bawalis* also smuggle logs covered by Nypa leaves. Logs smuggled out by the fishermen and *bawalis* in this process have been estimated to be worth around Tk 1.35 billion per year.

The corrupt forest officials extort almost Tk 62.5 million annually only from the *bawalis*. To cope with such extortion, they have to collect four times higher volume than they are permitted to, which accounts for almost 0.12 million ton of extra Nypa leaves each year. Similarly, the fishermen have to pay tolls to the corrupt officials for each trip and at the time of obtaining or renewing their yearly permit for the boat. They also have to pay at different check-posts in the transportation route. The corrupt forest officials extort around Tk 230 million a year from the fishermen. In addition, they often allow entry into the wildlife sanctuaries in exchange of bribes. Besides, indiscriminate fishing, particularly to collect shrimp fries illegally in exchange of bribes adversely affects the reproduction of fish and destroys the ecosystem. This corruption related part has been produced by TI report which apparently covers partial direct value which is being lost every year.

Other Economic Values:

Above we have concentrated on two aspects, climate change and corruption. However by concentrating on those on two aspects one gets a partial view of loss and also miss the indirect effects of those two worries. As a matter of fact, different valuation techniques are required to capture values for forest. We may begin our effort in attempting some valuation application using valuation techniques in the case of the Sunderban. We already know that the importance of the Sunderban is apparently vast. It is not only valuable for the wood products or non-wood forest products, its value in ecosystem and global warming reduction is also equally important. Moreover, the value of the Sunderban in terms of ecotourism deserves special attention.

If we take the last case of ecotourism and would like to have an assessment by using the economic tools which we can readily say whether it is worth preserving or should be cleared for development. How can one proceed in this direction? In this particular case, the Travel Cost Method (TCM) looks appropriate. Let us elaborate it further.

The Sundarban have different values; direct values, indirect values, option values, existence values and bequest values. Since the Sundarban have values other than those as the source of timber or agricultural lands whether they are cleaned, it is important to recognize all components of the total economic values (TEV). The TCM

¹¹ US\$ 1=Taka 69 approximately.

technique is used to infer the values of a tourist spot on the recreational experience of visiting a mangrove forest. However, the technique does not include the value given by people who do not travel to the site and it may be an underestimation of TEV.

However, one need not stop here to look at the shortcoming of TCM; since other values are also associated with the reservation of the Sunderban we should try to identify them for our analysis. We have to see whether other values can be captured. Let us take the case of existence value. Existence value means WTP for a resource for some moral, altruistic or other reason that are unrelated to current or future use. Maybe the WTP for local people who do not visit the area is quite substantial or there can be potential willingness to pay on a global warming impact. To capture these special values we have to use the contingent valuation method (CVM), which simply sets up carefully worded questionnaires, which ask people about their willingness to pay to avoid and / or accept (WTAC) for changes in environmental resources. Responses to these questions can give a preliminary idea of people's preferences. In this particular respect the importance of economic valuation technique is quite important. Our elaborate example of the Sunderban indicates that its destruction will bring enormous loss in value and its preservation become more viable. So the loss which is seen normally concentrating on direct value of corruption is much less than the value which gets by adding all economic values. The preservation of Sunderban through reducing the dosages of corruption will increase the value of a globally important commons.

In table 2 below we have tried to show some indicators for capturing some value of Sundarban taking simply a part of Sundarban in some of the cases. **Valuation covering the total area will be thousand times more than the present partial picture.** The basic idea behind this is that if a complete valuation of Sundarban can be accomplished it will help us get a picture of true value and actual economic loss. This partial picture of valuation can work as a good approximation.

Table 2: Economic Valuation (a partial picture)

Direct Use Values	US\$ 337,698
Sustainable Harvest Products:	
Fuel Wood	US\$ 68,906
Fishing	US\$ 72,000
Duck Keeping	US\$ 33,692
Tourism	US\$ 48,635
Genetic Materials	US\$ 68089 one-time Use Value
Education	US\$ 5,000
Human Habitat	US\$ 41,376
Indirect Use Values:	US\$ 888,354
Ecological Function	US\$ 525,258 one-time Use Value
Protection of Endangered Spices	US\$ 93,096
Carbon Store	US\$ 270,000

Option Values:	US\$ 155,632
Future Uses: Medical Importance	US\$ 155,632
Existence Values:	US\$ 204,267
Biodiversity	US\$ 204,267
Total Economic Value	US\$ 158,5951

Basis of Calculation and Sources of Different Values:

Protection of Endangered Species: This value reflects compilation studies of developed nations, mostly conducted in the USA and estimated using Contingent Valuation Method (CVM). Average value per ha US\$ 8 has been used. (Source: Economic Valuation of Environmental Impact ADB 1996)

Watershed Protection of Fisheries: The calculation of value here refers to the similar studies done in Cameroon. US\$ 54 ha. Total hectare $9727 \times 54 = \text{US\$ } 525,285$ (Source: Measuring Environmental Quality in Asia. ADB and Harvard University 1997)

Tourism: Values for this activity has been collected from the study done in Cameroon using Travel Cost Method. However, it has been adjusted to a reasonable level of Willingness to Pay (WTP) value considering the low- income level of resident. Calculation of total value for this section has been accomplished in the following fashion: US\$ 5 per ha. Total ha 9727. $9727 \times 5 = \text{US\$ } 48,635$. (Source: ADB 1997)

Carbon Store: Values of carbon store has been adjusted from US\$ 1300 to US\$ 300 per ha as these Studies were done in the developed countries where income level is high and WTP is naturally higher than ours. Total value: US\$ 300×900 ha of swamp forest = US\$ 270,000 (Source: ADB 1997)

Genetic Materials: This activity carries value from the study done in Cameroon. Calculation is based on US\$ 7 per ha. Total value US\$ $7 \times 9727 = \text{US\$ } 68,089$ (Source ADB 1997)

Education: This value refers to the value calculated in a case study in Thailand. Value for this object varies from US\$ 33- US\$ 77000. (Source) ABD 1997)

Human Habitat (improved sanitation and water availability): Values for this part has been derived from the studies done in Nigeria using CVM based on WTP. However, Values have been adjusted due to low income of our beneficiaries US\$ 8 per household. Total benefit: Total Household US\$ $= 8 \text{ US\$ } 4,1376$ (Source: ADB 1996)

Medical Importance of Sundarban: Values have been derived from Indonesian case study. Per ha US\$ $16 \times 9727 = \text{US\$ } 155,632$ (Source: ADB 1997)

Biodiversity: Values have been derived from case studies done in the developed countries. The adjusted value for our purpose is calculated in the following fashion: US\$ 21 ha. Total value 9727x21 = US\$ 204,267 (Sources: ADB 1996)

However, the above category of valuation items reflect a partial picture as there are several other direct values one can derive from procured honey, different animals especially tigers, deer. Monkeys, birds and numerous endangered species.

Policy Induced corruption and Climate change

Ironically Bangladesh follows a faulty forest policy aimed at maximising revenue from forest products neglecting the issue of conservation. Government sets a revenue collection target every year, which is usually a certain percentage higher than that of the previous year. Achievement of such targets often becomes the principal criteria by which performance of the forest officials is evaluated. As a result the officials are under pressure to aggressively meet the target, for which they resort to unauthorized means of collecting the revenue. It opens up the scope of corruption as the main target becomes revenue to be achieved at any costs. Recent disclosure by the authority shows that the Ex Chief Conservator of forest was one of the richest men of the country.

If we further explore the situation we see that dishonest businessmen in collusion with dishonest forest officials also take advantage of the revenue-oriented policy, which creates the scope of unsustainable extraction of forest resources. TI reports indicate that due to extortion by the officials the collectors of forest resources (bawalis and fishermen) are, for example, compelled to collect four times higher than they are permitted.¹² Such "need-driven" ill practices by officials whose low salaries and benefits and ineffective incentive structure are no less responsible for corrupt practices, soon feed into greed-driven corruption. This in turn provides incentive to other beneficiaries, and thus corruption becomes embedded. This vicious circle in the form of a cartel has been working for decades. So corruption scope has been created by government and being explored by the officials and their collaborators.

Unfortunately this rapid depletion of forest resources in Sundarban as a result of this peculiar combination of climate change and corruption will have further cumulative effects on impact of climate change in general over Bangladesh. Affected by the climate change, Sundarban will not be able to play its carbon storing role, nor will it any longer provide the "bio-shield" against cyclones and tidal waves mentioned above. Sundarban's capacity to stabilize the coastal land by trapping sediments will also be lost. Illegal logging and over-extraction of different forest products negatively affect the regeneration capacity of the forest, worsening the perilous condition of the world's largest mangrove forest. It will also create instability in the region as millions of people depend on this vital global asset.

CONCLUSION AND RECOMMENDATIONS

1. A massive awareness creation locally, regionally and globally is a paramount task for saving this global resources from destruction. The issues need to be discussed at the global forums at a regular basis.

¹² Transparency International Bangladesh, *op.cit.*

2. Sealing of corruption sluice gate by shifting from revenue oriented forest policy to a policy of sustainable extraction focusing on conservation.
3. Incentive based policies, Market Based Instruments, need to be framed. This should include: Sharing of revenue with the locals from forest products, Involvement of locals in forest management, encourage social forestry by allocating land.
4. Shrimp culture should be stopped as salinity causing enormous loss to the people who are living there.
5. Creation of alternative employment through investment in different environment friendly projects...
6. Forest resource management should be given particular attention in national development and planning process. However. Climate change adaptation must be mainstreamed into national development and planning process also.
7. A special forest protection force comprising of villagers from 76 villages, honest officials from the Forest Department, police, army and border guards should be established to control forest corruption. Specific measures must be taken to monitor the movement of transport to stop smuggling of illegal logs and other valuable spices. In case of death of local participating villagers compensation should be given.
8. A market driven policy, comprising of both negative and positive incentives - rewards for good performance and punishment for lack of integrity - should be in place and enforced. Steps should be taken to depoliticise the appointment and posting of forestry officials. International recruitment with regional support can be added to this appointment procedure.
9. Accountability of forest officials should be ensued through strict scrutiny through creating separate employment criteria. All officials must disclose information on their income and asset regularly to the concerned authority, which should be periodically updated and checked. A separate section at NBR should be established to look into this area. International auditing team can be hired through IFC and UNDP support.
10. International surveillance should be established as the area of Sunderban covers more than one country and requires huge financial resources to manage. Bangladesh alone can not ensure its survival with scanty resource and a corrupt army of forest officials. The role of forest community should be given top priority considering the “grand fathering” role.

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