

Forest crisis and wildlife conservation

The IUCN Regional Conservation Forum being held (10-14 Sept) in Nepal brings together conservation experts from across Asia to talk about Protected Areas and biodiversity. In Bangladesh, as the forest cover has fallen in recent decades, the quality and health of our system of Protected Areas -- created initially as refuges for wildlife -- has suffered even more grievously. In this writeup, **Ishtiaq U Ahmad** and **Philip J DeCosse** identify the evolving challenges to conservation and propose a practical roadmap for harmonizing national wildlife conservation needs with the aspirations of rural populations living in and around Protected Areas.

SINCE the creation of the Forest Department's first Wildlife Circle in the mid-1970s, wildlife conservation issues have received less attention than plantation forestry and traditional silvicultural practices. From the perspective of the typical Range or Beat Officer in the field and this is often said by staff "there is nothing to do in a Protected Area" (those areas designated under the Wildlife Act 1974).

As trees fall and forests are thinned, wildlife disappears. The total number of Hoolock Gibbon our only ape species will soon be in double digits in the wild. Flagship species such as the Asian Elephant and the Bengal Tiger are in similar states of crisis, as are hundreds of lesser known species of cats, birds, butterflies and plants, to name a few.

How has this neglect of our once pristine Protected Areas and the consequent loss of biodiversity come to pass?

Challenges

The Forest Department has faced a number of challenges. The Wildlife Act allows for little involvement of local communities in conservation of Protected Areas, leaving Forest staff to conclude that their principal role is to keep everyone out of the Areas, and to arrest and or prosecute those who do enter. Because there is no plantation work to be done in a Protected Area, budgets for management of the areas have been much smaller than other Reserve Forests. In the absence of any Protected Area Management Plans or any systematic wildlife management training -- local Forest staff have focused almost exclu-

sively on the goal of "keeping people out". In those Protected Areas where staff and other local or national powerful interests have been less than honest, Protected Areas have provided an ideal venue for theft of logs, fuel wood, and establishment of brick fields or other encroachment of lands.

The reigning de facto fiscal policy of recent decades namely, that forests are to provide an important contributor to the Government's annual revenue -- has also adversely affected wildlife. Forest Officials under pressure to meet annual revenue targets set by the Government have naturally paid less attention to the Protected Areas, from which only scant revenue from visitation has been generated.

Consider the challenges of managing the forest impact of the brick burning sector alone. A single brick field makes on average 2.4 million bricks a year, and this requires 1,000 tons of fuel wood, or the equivalent of 40,000 head loads of wood from the forest. Although the Brick Burning Control Act explicitly prohibits brick fields within 3 km of any Protected Area or Reserve Forest, many brick fields have situated themselves directly adjacent to Protected Areas because they can extract "free" wood fuel and clay. At one Protected Area in the south of the country, 15 brick fields have situated themselves either directly inside or immediately adjacent to the forest. In a single year, this number of brick fields will require 600,000 head loads of fuel from the forest to operate. Addressing this sort of threat to Protected Areas requires an approach fundamen-

tally different than the exclusionary approach included in the Wildlife Act.

Eco-parks and nature recreation

In the past decade, the Government has responded to the loss of natural areas primarily by fencing of small subsections of the larger Protected Areas and designating them as Eco-Parks or Safari Parks, with the principle objective of nature recreation. These recreation areas six of which are now in operation -- provided an opportunity for 800,000 paying visitors in the last year alone to have a taste of nature. Many of those that have visited these areas have never seen wild animals before, nor walked through a forest.

In providing a nature experience for these hundreds of thousands of citizens, the Forest Department has provided an important service to the nation.

Participation, livelihoods and conservation

Eco-Parks and Safari Parks, however, are not a sufficient response to the need for wildlife conservation nor to the needs of local populations that have depended on the forests. That can only be addressed through protection and regeneration of larger natural ecosystems and the participation of local stakeholders.

To this end, the Forest Department has recently taken important steps in setting a new strategy and approach for Protected Areas management, based on the now-accepted ideas of participation, rights and benefits.

Under the Department's Nishorgo Program for Protected Area Management, collaborative management Councils have been established for pilot Protected Areas and local stakeholders are taking part as "co-managers" of the Protected Areas with the Forest Department.

Today, this Nishorgo approach is being followed at five pilot Protected Areas and is now being extended to other areas. The work of Nishorgo parallels similar collaborative Protected Area management efforts undertaken in Nepal, India, Sri Lanka, and Indonesia, not to mention Europe and the US. Promising results are emerging, both in reduction of conflict and in forest conservation.

Practical steps for moving ahead

Participation, rights and benefits-sharing form the three core values on which the Department can consolidate and expand improved wildlife management, but a number of other actions should follow.

In their assessment of Forest Department's institutional capacity for wildlife management in 2004, Drs. Khairul Alam and Art Mitchell recommended that more senior officers be given direct responsibility for managing individual Protected Areas, not least because of the complex socio-economic challenges faced at the PA level. The role and authorities of Assistant Conservators of Forest (ACFs) in particular need to be enhanced at the level of Protected Areas.

If local communities are to become active supporters of conservation, they must see livelihood benefits. Entry fees to Protected



Dulahazra safari park

Areas where they are charged now are channelled directly back to the central government, without any benefit to the local communities. Entry fees should be charged at all Protected Areas where Co-Management Committees are active, and those Committees working to conserve the areas should receive compensation in the form of a proportion of these entry fees and other fees generated by the Areas.

More extensive investment in modern Protected Area management training approaches needs attention. Currently, there exist no Master's or even Diploma programs in "Protected Area Management" in Bangladesh. Systematic re-training of field and central staff in modern participatory wildlife management can be gainfully undertaken at the Forest

Academy.

The Wildlife Act and a new Wildlife Policy have been in re-drafting stages for some time, but work remains to be done to integrate the two documents so as to present a forward-looking roadmap consistent with international norms and current best practices in Bangladesh. The two documents would benefit in particular from explicit inclusion of the following important concepts: collaborative management; stakeholder benefits sharing; respect for minority or indigenous rights; restrictions on select activities within defined landscapes; community-conserved areas; and, prior consultation before creation of new Protected Areas.

The Wildlife Advisory Board established under the Wildlife Act has not been as strategic as it could

be. In recent years, it has been pressed to meet and discuss issues such as zoo permits and crocodile importation that might be addressed elsewhere. It would be timely for the Board to constitute a technical "Scientific Advisory Subcommittee" of active and eminent wildlife-related researchers that would provide both advice and oversight to the wildlife work of the Forest Department and to the activities of the newly created Co-Management Councils.

There is no shortage of nature-lovers in Bangladesh, but these individuals have not yet coalesced as advocates for conservation of a unified system of Protected Areas. When land at Bhawal National Park is encroached or brick fields destroy Teknaf Game Reserve, civil society has been largely silent. Without an active constituency in

support of Protected Area conservation, our flagship species will soon be gone, and lesser known species will follow behind. It would be timely now for a grassroots network of "Friends of the Protected Areas" to emerge.

The Forest Department working with local Co-Management Councils possess the skills and vision to turn the tide on rapid wildlife habitat loss we face. The policy and institutional changes identified here can help ensure that the Department achieves its Nishorgo vision of "Saving Nature for Future Generations".

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Floods, rains and Dhaka city drainage

PROF MUSTAFIZUR RAHMAN TARAFDAR

EVERY time major floods occur in the country and every time it rains, the city of Dhaka faces acute drainage problem. Parts of the city go under water. In the densely populated city, woes of people know no bounds.

In 1954, 1956, 1988, 1998 devastating floods occurred submerging 70 percent or more of the country. Along with the country most of the Dhaka city except pockets of high spots went under various depths of water. There was flood water in old city, eastern and western parts.

However in earlier years, as the eastern and western parts of the city were mostly agricultural lowlands with a few or no human habitation, flood damage remained confined to the city proper only. There was no huge and cry and suffering of people as it is today in the eastern part.

In spite of huge investment over the years, particularly after 1988 floods when almost whole city of Dhaka went under water, the 1998 floods appeared most devastating. About Dhaka city, drainage situation aggravated due to silted-up, blocked drainage channels. WASA's limited storm water drainage is too inadequate for a city of

850 sqkm (Greater Dhaka).

Causes and problems

Causes of floods and drainage problem vary in different zones (areas) of the city depending on topography (elevation, high, low), proximity to rivers, peculiar areas like housing estates etc. Two main causes of floods in the city are river floods and runoff from rainfall.

River floods: Rivers surrounding the city like the Sitalakhya, Buriganga, Turag, Tongi and Balu cause floods in the city. This year low lying areas in the eastern part of the greater Dhaka city was heavily flooded. One point is that for some reasons the proposed flood protection eastern embankment/bypass was yet to be constructed.

The western flood protection embankment protected Uttara, Airport, Nikunja and other areas from floods of Turag and Buriganga.

Rainfall: Due to bad drainage system in the city where most of the channels were encroached upon by the land grabbers or were choked up or filled up with illegal dumping of solid and construction wastes water logging occurs all around the city. Most of former flowing/living channels are now non-existent. Even the large ones like the Begunbari channel were either encroached

Master plan of Dhaka City Drainage should be prepared by an experienced consulting engineering firm. A national committee composed of experts from relevant organisations may guide and oversee the activities of the firm. The whole city may be divided into drainage zones according to topography and location. A multi-disciplinary national committee composed of experts from relevant organisations may be formed to find causes and effects of floods and drainage problems in the city (Greater Dhaka and Metropolitan area), and outline preventive and regulation measures.

upon or the outfall closed with consequence that runoff cannot flow as it used to in 50's, 60's and even 70's Gulshan, Banani, Baridhara and Uttara lakes are blocked at the outfall. Many other channels in the eastern Dhaka, South Badda, Khilgaon, Bashaboo, Shahjahanpur, Jatrabari etc. were partly or full occupied by unauthorized illegal structures. If channels are improved, heavy runoff will quickly flow outside the city.

Housing estates: Gulshan, Banani, Baridhara and Uttara and perhaps other satellite towns like Bashundhara, Asian City, Amin Group etc. are relatively on higher lands and runoff thus flows into the lakes which incidentally work as buffer flood control reservoirs. Except some pockets of transient water-logging in the above areas waters are quickly drained off.

Eastern part: The eastern area of the city is heavily affected by river

floods and also by runoff. Flood water ... standing as river levels remain high. It strongly suggests pumping of flood/runoff waters when the eastern embankment would be constructed. Similar pumping is necessary in western embankment area.

Old city: The old city is affected by runoff form rainfall. Numerous low pockets remain water-logged. If drainage channels are built or water flows through improved channels this flood situation will improve. WASA may also be of help with storm water drains. It is necessary as open drains may be difficult to run because of congestion in the area and its unique situation/location.

Water-logging in DND Project: One of the earliest irrigation projects, the DND (Dhaka-Demra Narayanganj) project was built by the then EPWAPDA (now BWDB). The project was meant for produc-

ing rice crops by irrigation. In recent years agricultural low lands were purchased or illegally acquired for residential use. Canals were encroached upon, both irrigation and drainage channels were encroached upon by influential people. Due to heavy downpour on June 15, 2007 the whole Dhaka city and adjoining areas were flooded. With drainage channels closed here and there, DND project area was fully water-logged.

Another reason is that due to low level of the outfall of the drainage channels, natural drainage is not possible due to higher level of water of the river Sitalakhya. As a result the water of the DND needed to be pumped out. But sometimes some of the pumps remain out of order. BWDB should keep the pumps in good working condition at all times.

Some unconventional causes: Though the unconventional causes like the slow subsidence of ground surface in general can occur over a long period of time, they deserve serious consideration. For gradual subsidence over many years might turn out to be serious in magnitude and dimension. This may happen for both natural and man-made causes.

Natural process soil erosion: Anytime heavy rainfall occurs, it erodes some soil in the city area. Ceaselessly the rainfall has caused erosion and sediment was transported away by runoff to the adjoining rivers bounding the city, through rills, small channels. Only a proper contour survey available for 50's or 60's or later years may be compared to see the magnitude of erosion, consequently lowering the ground surface level (subsidence).

Man-made causes: There are two such causes of land subsidence --

Subsidence due to pumping: Due to continuous pumping by hundreds of deep tubewells, ground water level below Dhaka city is falling. It may be mentioned that for continuous pumping in Tamil Nadu and Gujrat States in India, ground water dried up in millions of tubewells. There is no irrigation now, only low-yielding rain-fed agriculture is in practice. Drinking water is brought to the large affected area with hundreds/thousands of trucks daily! One may ascertain difference

between ground level now and that some 30 or 40 years ago and estimate the evidence and extent of subsidence.

Groundwater aquifer (aquifer is water holding stratum/layer of soils) consists of trillions of water-filled voids. As pumping continues over the years, voids are depleted of water and as a result due to over-head soil pressure empty voids may get contracted which may accentuate subsidence. Though a very long term process, it may happen. It is worth investigation and studies.

High rise buildings: For the last 25 years or so thousands of high rise buildings were constructed all over Dhaka. Though developers generally take good care in foundation design considering bearing capacity versus subsidence, there are thousands of multi-storied buildings which were privately constructed. I have doubt whether they took care of foundation design adequately. In the years to come there may be a global effect of millions of tons of imposed weight on the surface which may cause subsidence in the soft alluvial sedimentary soils underlying the city. A six-storey residential building on 5 katha (3600 sft) may weigh 5000-7000 tons. Our learned geologists and foundation engineers might have answer to this. If the answer is an emphatic yes, it may be of concern to all of us.

All the above three causes particularly the man-made ones might look speculative at the moment. But after serious investigations, comprehensive relevant surveys and intensive studies, we might obtain a suitable answer.

June 15, 2007 rainfall: Let us analyse the rainfall of June 15, 2007 that occurred for a duration 6 hours (6 pm to 12 midnight) with a total rainfall of about 100mm.

Greater Dhaka has on area of 850 km². Preliminary estimate shows that a flow (discharge) of 3,000 m³/s was generated in the greater Dhaka and 2,000m³/s in the metropolitan area. Both the figures are designed discharge. Canals of 200m bottom width x 1.5 deep x side slope 1.5:1 x bed slope 1/1000 and other canals of 150m, 100m, 50m and 30m bottom width can be designed for the drainage of the greater Dhaka city. About 35

trapezoidal channels of various capacities are required to achieve drainage of the city.

Begunbari channel takes off from Dhanmondi lake but Mirpur road blocked it near Panthapath crossing. It is again perhaps blocked by roads notable Nazrul Islam Avenue before Sonargaon Hotel. It resurfaced behind the hotel. On its way a lot of illegal structures, some multi-storey buildings were constructed between Sonargaon Hotel and its crossing at Shahid Tajuddin Road (Tejgaon Road). The channel then veers north-eastward meeting the combined drainage channels from Gulshan-Banani lake and Mohakhali drainage channel at a point 5 km south of Gulshan Lake (E). Then it moves east-southeastwards meeting a north-south channel in low areas south of Badda and moves eastward to the proposed Eastern Bypass.

Begunbari channel is the main drainage channel of the city, both larger in dimension and longer in stretch, and moves west to east draining the crowded parts of the city: Tejgaon, Mohakhali, Kawan Bazar, Panthapath, Banani-Gulshan and open areas in the east and Green Road, Farmgate area. With 200m width and proper designed dimensions, it can carry a discharge of 400-500m³/s i.e. 1/7th to 1/6th (15%) of the total runoff generated by June 15 rainfall. Begunbari appears to have large catchments. It also drains entire Badda, Rampura and Khilgaon areas, open areas in the east on both sides of Begunbari. The feeder channels, Mohakhali-Banani-Gulshan lake, north-south canal meeting Bagunbari should be excavated and improved. Begunbari channel acts like a drainage divide between the north and south of the metropolitan area. Another divide existed in old city, now filled up Dholai Khal channel which ran west to east dividing the old city drainage to the canal from the north and south.

From contour plan of the Begunbari and catchment and characteristics of channel catchment plan, synthetic unit hydrograph may be drawn by using maximum daily rainfall data for 20 to 30 years. From unit hydrograph peak flood of 25 years, 50 years or 100 years frequency versus depths can be determined for the design of channels. Similar methods can be used for other channels in other zones/areas.

Some recommendations

Master Plan: Master plan of Dhaka City Drainage should be prepared by an experienced consulting engineering firm. A national committee composed of experts from

relevant organisations may guide and oversee the activities of the firm. The whole city may be divided into drainage zones according to topography and location.

Eastern Bypass: An embankment by the east of the city (Eastern Bypass) may be constructed as quickly as possible. If the Eastern Bypass is delayed for the Master Plan, the city will continue to suffer. Western embankment was not delayed for the Master Plan.

Cleaning of canals: All silted up and choked up channels large, medium or small, should be excavated and made efficient for drainage of rain water. These moribund channels should be cleared and designed to carry runoff in 25 or 35 channels as outlined earlier.

Open area drainage: Drainage channels in the open areas between the city and the existing west and the proposed eastern Bypass will be designed to carry flow and evacuate in the embankment sluices. In some points pumping may be required. We are to design pumps, pump houses etc.

Embankment: Embankment along the Buriganga in the southern side should be strengthened in order to prevent river floods. Drains should carry runoff from rainfall.

Protection from future grabbing: Excavated/cleared existing closed or blocked channels should be protected from future grabbing by enacting strict laws, if necessary.

DND drainage: Drainage channels in DND project area should be cleared and made efficient to carry runoff. Pump house should be made efficient and repaired when necessary. Water-logging in DND area is man-made artificial creation.

Multi-disciplinary national committee: A multi-disciplinary national committee composed of experts from relevant organisations may be formed to find causes and effects of floods and drainage problems in the city (Greater Dhaka and Metropolitan area), and outline preventive and regulation measures. The committee will assist in the selection of an experienced consulting company. The Committee will prepare its own TOR and draft TOR for the consultants. The committee will continue to guide and oversee the activities of the consultants during its tenure.

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Dhaka city experiences a deluge every time it rains heavily