

WILDLIFE CONSERVATION

Death of two tigers: Immature science in immature hands?

SIRAJUL HOSSAIN

A leading daily newspaper published report about the death of two Bengal tigers (*panthera tigris tigris*) in Sundarban mangrove during research by anesthesia and radio-collaring (The Prothom Alo, January 31, 2008). According to the report the first tigress was captured around end April 2005 and died six months later having the collar on. The second tigress captured in March 2006 was second time tranquilized in December 2006 to remove the collar. The BBC film crew captured this second tranquilizing sequence of near dead tigress and added it to the film "Ganges" and are now showing worldwide the last scenes of that pathetic tigress. The tigress was assumed dead immediately afterwards.

The research project was initiated about four years back by Bangladesh Forest Department. James L. D. Smith, Professor, Department of Fisheries, Wildlife and Conservation Biology of The

Sunderbans" but later the project was addressed as "Sundarban Tiger Project" or STP. Initially the main goals of the project were: A. To find out the home range of tiger. B. Tiger density and prey abundance in relation to forest cover. C. Tiger-human interaction. D. Change of behaviour in response to tidal, diurnal and seasonal fluctuations. E. Behaviour change with cubs and last kill etc. The initial objective of the project was purely scientific but after the death of the first tiger and related public reaction, the project changed its face and added some monster goals like A. Conservation capacity building. B. Creating public awareness etc. The initial goal, Research became a part of the programme. But even after inflating the project paradigm in such a vast forest like the Sundarbans, the project working manpower remained the same -- the PhD student Adam Barlow, one forest guard, one speedboat driver and three helpers who had no prior experience and no considerable education. The Save the Tiger Fund and the United States Fish

Chemical immobilization techniques and their protocols for wild animals are still immature science. Many species of Asia and those which are special like saline water tigers cannot be experimented without proper knowledge of the drug and its interaction. For any chemical immobilisation a licenced veterinary doctor with specific knowledge on the species and the pharmacology should be present at the field and should be officially responsible for the status of the animal.

and trap them using snare and then tranquilize by using Telazol, a general purpose anesthetic used for animal anesthesia. As wildlife photographers naturalists we always gather information on the species and try to remain informed. It struck in my mind that somewhere I read that tranquilizing wild tiger can be fatal to the animal and that's why it has been stopped in many countries and not permitted any more. But I couldn't recall where I got that information from. I expressed my concern to Adam and told him to check this matter with experts.

After I came from the forest I sent a mail querying the effect of Telazol anesthesia on wild tiger to one of my American friends who is working Roche, a leading pharma-

to an active metabolite or enterohepatic recycling via bile. The white variant of tiger has been documented to seem especially susceptible to this effect. Some practitioners have found that this adverse effect of Telazol is found only in Siberian tiger populations; however, the number of mixed tigers precludes reliable identification of subspecies outside the carefully documented lineage of zoo tigers".

I also found many other references soon about the adverse effect and reports on cause of death of tiger relating to application of Telazol. I came in contact with Simba Wiltz, who is a Handler of big cats in Thunderbolt Big Cat Rescue, Florida. Simba got his Doctor of Pharmacy from University of North Carolina at Chapel Hill in 2004. He personally wrote me:

"It has been shown that Telazol recycles in the system of cheetahs and it is suspected that it may do the same for tigers -- in fact, Tiletamine/Zolazepam should NOT be used in tigers for that very reason. You should consult the on-staff veterinarian regarding other agents available, and make sure that someone experienced veterinarian is available to perform the procedure who knows emergency responses. Still, standard of care at least in US facilities does not include Telazol for chemical control of tigers. He also noted Ketamine is notorious for causing seizures in big cats which can be lethal, proper protocol should be maintained".

An article published in Australian Veterinary magazine, named Tiger anesthesia, by L. Vogelstein, Veterinary and Quarantine Centre, Taronga Zoo, Mosman, New South Wales:

"The use of Zoletil (same as Telazol, Tiletamine/Zolazepam) is contraindicated in tigers: recoveries are prolonged (hours to days), various neurological signs have been encountered, and there have been reports of deaths during and after its use in tigers. - Aust Vet J Vol 77, No 6, June 1999.

Husbandry manual for small felids describes:

Another commonly used drug for felid anesthesia is Telazol (Animal Health Group, A.H. Robins Co.), (also marketed as Zoletil, (READING Laboratories), a 1:1 combination of Tiletamine HCl and Zolazepam HCl. An advantage of Telazol is its availability as a dry powder that can be concentrated

from 100 to 500 mg/ml permitting small drug delivery volumes. ... The disadvantages are occasional minor CNS signs, usually in the form of mild tremors. A re-sedation 3 to 4 days following Telazol anesthesia has been reported in some species of large fields (tiger, lion, cheetah). The cheetahs experiencing this problem originally had prolonged anesthetic episodes that required several Telazol supplements. Similar observations have been reported in some tigers. These animals usually show mild sedation with stumbling and may require supportive treatment for 12 to 24 hours before returning to normal. The use of Telazol in tigers has been replaced with Ketamine and Xylazine due to this re-sedation. If supplementation of the Telazol is required, it is advisable to supplement with Ketamine (instead of Telazol) at a dose of 2-4 mg/kg intramuscularly or 0.5-2 mg/kg intravenously.

Nielsen L. also suggested in his book "Chemical immobilization of wild exotic animals" that Telazol should not be used for tigers and can cause death".

Instead of Telazol, some experts are suggesting Ketamine and Xylazine. But as a newer anesthetic there are not much field data available. Also the protocol is more complicated for Ketamine than Telazol. Telazol is more popular to the field researchers because it has a simpler protocol and it is found in power form which is easy to carry and preserve.

Cat metabolism and pathology is complex and not very well known yet to science. Most of the research regarding chemical immobilization is done by the veterinary and anesthesia specialists. In most cases the animal tested remains in captivity or in the zoo. For wild animal the research is very difficult and often not permitted in most countries. Which is specially true for endangered and rare species. Many of these drugs are used for emergency situations for wild animal where there is a life threat for the animal or for human. Many local people reported and in the BBC film "Ganges" it was commented that both the tigers showed abnormal behaviour and there were reports of attacking people. In Eastern Sundarban, places like Katka and Chaprakhal, where many tourists walk on the meadow and the beach, or fishermen work day and night, there were never

reports of aggressive behaviour of tigers. Even the first tiger jumped over Dr. Tapan Kumar Dey, DFO and his team when they were trying to photograph it collaring. They jumped on the nearby pond to save themselves in Kochikhali.

Tranquillizers work on the central nervous system of the animal. There are reports that Telazol may cause long term psychological effects on tiger. The tranquilized tiger may feel dizzy, sedated some time and can feel irritated or anxious some other time. Possibility of hallucination also claimed.

"Some tigers, especially Siberian tigers have shown greatly prolonged recovery and recycling of Telazol that has caused CNS signs several days after immobilization. These signs may come and go for days or weeks post-immobilization." - Christopher J. Katz D.V.M., Anesthesia of Exotic Cats

In 1992 during the research on Amur (or Siberian) tigers (*Panthera tigris altaica*), researchers caught some tigers using Aldrich foot snares, the snared foot was swollen in all cases. They anesthetized tigers with a mixture of ketamine hydrochloride and xylazine hydrochloride instead of telazol.

Pharmacokinetics is the process by which we know how a drug is absorbed, distributed, metabolized, and eliminated by the body. Any drug before application on any animal pharmacokinetic observation should be done. Little pharmacokinetic information is available for Telazol (Tiletamine HCl / Zolazepam HCl).

The Sundarbans is a unique place and also the only great ecosystem in the world where Bengal tigers live in saline water system. Life of a wild tiger is extremely challenging and very much depends on the physical and psychological integrity of the animal. For zoo or captive tigers physical wellbeing is enough for their survival. But for a wild animal her physical and psychological performance together only can ensure her survival. There has not been any pharmacological research to find how the above chemicals will affect specially the Sundarban tiger that drinks salt water and eat the intestine of the kill full of mangrove vegetation. Before this research is done and proven safe, there should be no other application of those drugs on healthy tigers in the wild.

Dr. Ullas Karanth started tiger



One of the collared tigers (the second one).

research in Nagarhole reserve forest in India using chemical immobilization and radio collaring. After the death of several tigers the Chief Wildlife Warden of India (same as our CCF) cancelled his permission for that fatal research. From then onward tranquilizing healthy wild tiger is not permitted in India anymore. Exception is only in case of relocation if any tiger is proven to be a man-eater. Dr. Karanth and many of his foreign partners seem very eager to tranquilize wild tigers may be wants to finish their incomplete research which failed in India. The tiger radio collaring project in Bangladesh was motivated by the group of experts who are very keen to do research where getting the permission for it is easier. In an interview with the famous Indian technology magazine "Dataquest" Karanth said in June 2007:

"The biggest issue in use of technology, say radio telemetry or chemical immobilization, is the problems of getting research permissions."

The present radio-collaring methodology of wild tigers incorporates many issues which can be harmful or lethal to the individual tiger, or to the whole or part of the population. It can even increase human-tiger conflict if it is not practiced with a lot of care, maturity and responsibility. Researchers are using live cow as bait, which can infect wild species with new disease. Amur tiger researchers say they trapped 19 tigers and all of them had swollen legs where the snare was caught. Traps and snares can injure tiger and that could be enough for the end of their life. Applying anesthesia without proper understanding of the pharmacokinetics of the specific population can cause fatality or abnormal behaviour of the tigers and eventually can increase human-tiger conflict.

We all are aware that getting adverse effect information about wild animal research with any drug or procedure is very difficult. Expert community in wildlife

research is small and everybody knows each other. Only a few organizations are funding and nobody wants to say anything negative about friends and colleagues. Almost everywhere the wild animals are government's property and protected by the state law. If any wrong things happen somewhere, the news does not go very far, officials need to save themselves too. This creates misconception for others about choosing the proper method if it does not fall in his own discipline of knowledge. Often experts remain silent about a wrong idea fearing that criticism can make them isolated in the community.

Chemical immobilization techniques and their protocols for wild animals are still immature science. Many species of Asia and those which are special like saline water tigers cannot be experimented without proper knowledge of the drug and its interaction. For any chemical immobilisation a licenced veterinary doctor with specific knowledge on the species and the pharmacology should be present at the field and should be officially responsible for the status of the animal.

There are some experts who are very much interested in gizmo science. They think the use of GPS and radio telemetry or any other high-tech gadget will solve every problem. Thick canopy like the Sundarbans may also impair GPS function and can put a lot of void in data. If the tiger shows prolonged CNS signs and abnormal behaviour with the effect of the drug, the acquired data by the collar will be vitiated. Any planning or strategy if implemented based on those erroneous data can cause harm to the whole population. The same research can be done with camera trapping (like Trail Master). Camera trapping is allowed everywhere and used worldwide without any harmful effect on the species for similar research.

Sirajul Hossain is a wildlife photographer and naturalist. Full version of this article may be available from: shossain.wordpress.com



The wild boar is no more afraid of the dying tiger, rather preying on it.

University of Minnesota appointed as a consultant and Adam Barlow, a Ph.D. candidate in the Conservation Biology Programme is engaged in the field research. The project effectively started its field activities in February 2005. They claimed that the idea for creating such a project was first developed during a field survey in 2001 conducted by Md. Osman Gani, Ishiaq U. Ahmad, James L. D. Smith and K. Ullas Karanth.

Initially the project was called "Tiger Study Project in the

and Wildlife Service funded the initial phase of research as the project website claimed.

On one of my many trips to the Sundarbans sometime in 2005 I met Adam Barlow. I came to know about his project and was delighted to know that something good was going to happen for the tigers in Bangladesh. I also found out that he was going to radio-collar eight to nine tigers, six female and two or three male. On my question of the method of radio collaring, I got to know that he was going to bait cows

and forward the query to one of his veterinary colleagues and she wrote:

"Telazol (tiletamine/zolazepam) is used in a number of wild cat species, but specifically should not be used in tigers. Experience has shown that tigers originally exhibit normal anesthesia during the procedure, but have neurological signs 2-4 days later which include seizures, ataxia, and paresis. Two theories behind this involve recycling of the tiletamine component

Reducing the destructive force of cyclones

ALTAJUR RAHMAN

CYCLONES are one of the major natural calamities in our country. These cyclones are caused by formation of low atmospheric pressure over warm waters of the southern parts of Bay of Bengal. After deriving power from high-speed wind and transforming heat and spinning motion from coriolis, these cyclones take a northward direction following low-pressure areas into Bangladesh and India. A catastrophic super cyclone like that took place in 1970 can exceed wind speed of 240-kilometer per hour and can trigger tidal bore of 40 feet or more. The cyclone Sidr was 400-500 kilometer wide in size, larger than Bangladesh, and its unstable atmosphere reached the height of 35,000 feet. Its enormous force dislodged underwater debris from 35,000 feet deep ocean and dumped it on the shore. Such severe tropical cyclones can be very destructive to life and property. About 1.5 million people died in November 1970 cyclone, 11,069 in 1985, 1,50,000 in 1991 and 15,000 in 2007. It is estimated that the total damage from Sidr alone is about US\$1.6 billion. Although 31 years have elapsed since the tragic cyclone of 1970 but the loss of life and property which these cyclones still causes is staggering. One of the reasons is that we have not been able to establish the required defence. Our measures to reduce death and damage so far have been inadequate, piecemeal and half-hearted.

The options to shield the plain lands of our coastal region against so great a force are few and expensive. What are these options? First is to provide an early warning of cyclone and moving the coastal people to cyclone shelters. Thanks

to the era of satellites now one can get upto date coverage of the movement of cyclone through global T.V. channels and web sites. While there is still a lot to cover in terms of accurately predicting, where exactly the centre of the cyclone will make landfall and what would be its intensity and impact, the major challenge is to convert this information into a timely evacuation plan. On mid-day of Wednesday 14th November, 2007 many people were evacuated to the cyclone shelters because of the cyclone warning of Bangladesh Meteorological Department. The Storm Centre of BMD in its bulletin forecasted that Cyclone Sidr would make landfall by noon. According to Mr. Farhad Ahmed of Disaster Management Bureau, when the people who took shelter saw that cyclone had still not come, they thought it would not materialize and left the cyclone shelters for their homes. Many of these people fell victim to the fury of the cyclone. BMD came under heavy criticism for having forecasted landfall ahead of time. However, according to Mr. Shah Alam, Deputy Director of Climate Division of BMD, the Cyclone Sidr reduced its speed before approaching coastal landmass and accordingly BMD on 15th revised its bulletin. It forecasted that Sidr would hit Bangladesh coastline on the same day in the evening between 6 and 10 PM.

One thing has transpired from this fatal mistake of leaving the shelter early is that people should remain in the cyclone shelters until it has left the area. It is important that cyclone shelters should have the basic amenities so that people could stay there for few days. There should be adequate facilities for water, sanitation, sleeping space, generator lights, and paramedics at cyclone shelters. Provision must be

There is an acute need for an integrated coastal zone management plan, not only to integrate cyclone preparedness and protection measures with the development plan of the area but also to give priority to such measures. We have seen the vulnerability of the coastal people to frequent cyclones. Their ability to revive and stand up against natural calamities has become seriously compromised due to precarious condition of the coastal region.

made for food so that evacuees could have meals for at least two days either from their own sources or from the government. The government should deploy trucks, buses, inland vessels to evacuate people to the cyclone shelters, Upajila and Thana headquarters and arrange for their return. This will encourage people to heed to cyclone warnings because at present warnings are often ignored because of the hassle to move to cyclone shelters and wrong alarms. There is necessity to develop good road networks in the coastal region for easy movement. The government should make facilities for EM. Radio broadcasts along the coast, which shall provide timely cyclone warning to coastal population.

There is dearth of cyclone shelters in the coastal region. Those that have been constructed (2,500) after the 1987 cyclone have worn out and require either major repairs or reconstruction. In densely populated areas, there should be bigger shelters. Existing government and public assets such as office buildings educational institutions, places of prayers should also be renovated to be used as cyclone shelters.

Secondly, sea walls or cost effective earthen embankments along the coastline are good option to create defense against tidal bore. Sea walls will be equally effective against predicted sea level rise due to climate change. Instead of constructing sea walls entirely of concrete these could be made having



Devastation by cyclone Sidr

concrete or brick lining on both sides with the hollow in the middle, filled up by sand bags or just sand to make it a strong and effective barrier. At present, the low height embankments can hardly repulse a 10.6 meter (34.77 feet) high tidal bore like that of 1970. In coastal islands such as Hatiya, earthen embankments exist but they are not covered by trees to compensate their low height and sustain the impact of cyclone wind. Embankments could be con-

structed with the earth obtained from excavating large tanks in the coastal region. This will also meet the scarcity of fresh water immediately after a cyclone. Government should start a major programme for constructing embankments -- concrete, semi-concrete or plains earthen depending upon the degree of threat so that all inhabited coastal areas can be enclosed. In fact, even the Sunderbans forest requires embankments to protect its habitats of living species. Lives

of many embankments have come to an end because some of them were constructed during Ayub Khan's time. Sidr washed lot of embankments and they need to be reconstructed.

Sunderban forest has saved many lives and destruction of property from the battering wind of Cyclone Sidr. Other options for protection includes extension of present Sunderban forest, which can help create a natural barrier against cyclone. Mangrove forest is

very effective to dissipate the powerful force of waves. Once Sunderban forest extended up to Rajbari district in the North, (along the Padma river) and to the coastline of Patuakhali district in the south east. During the British period, these areas were cleared for human habitation and cultivation. In the coastal islands and char areas along the coast, the government should bring all its khas lands under reforestation scheme. Emphasis should be given on thick vegetation from top to bottom. Coastal species of trees have mostly bare trunks, which make them unsuitable for facing combination of seawater and high velocity winds. Tall bamboo thickets can prove to be ideal for creating an impenetrable barrier. Cyclone wind is more destructive whenever there is open space. This could be sea fronts, watersheds, char lands, rivers, canals, paddies, fields, water tanks, front or backyard of village homesteads. If we can encircle all these open spaces with thick forestation, the impact of wind can be lessened. Village people can be motivated to undertake voluntary efforts under community forest schemes.

Cyclone Sidr caused heavy damage to village homes. Weak structures were smashed to the ground. In coastal areas wider side of houses face the sea. The narrower side if faced seawards it can sustain far greater impact of wind. Moreover, they are built on mud platforms mainly by wooden frames. Instead low cost concrete pre-fabricated pillars at least 4"x4" on each side should be used to build houses. Each of the pillars should have a foundation of four to five feet deep. Roofs of houses should be built not on wooden frames rather on iron angle bars so that tin sheets could be bolted

rather than nailed. Wooden frames give away easily to powerful swirling winds. Government as well as NGO's should take the initiative to introduce these house-building materials for rural folks at a cost effective price. Interest free loans through co-operatives for reconstruction of homes could immensely help them.

There is an acute need for an integrated coastal zone management plan, not only to integrate cyclone preparedness and protection measures with the development plan of the area but also to give priority to such measures. We have seen the vulnerability of the coastal people to frequent cyclones. Their ability to revive and stand up against natural calamities has become seriously compromised due to precarious condition of the coastal region. Environmental degradation such as disappearance of mangrove forest, wanton felling of trees and wetland encroachments are causing ecological disaster making it more difficult to face threats from climate change. It is predicted that global warming will increase cyclones and they will become more powerful and harmful than the experienced ones. Western countries have moral responsibility for the consequences faced by the developing countries due to climate change and must come forward to reduce its effect. Bangladesh should make its concerns deeply felt before the international community so that international responses against climate change should complement the national measures to save the lives and livelihood of millions of people living in the coastal region.

Altajur Rahman is a Manager (Legal Department), National Housing Finance and Investments Ltd.