

Dealing with man-tiger conflict in India

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INTRODUCTION

Man is associated with wild animals since ages. The first known evidence of man animal conflict is the seal recovered from Harrapan site dated as old as 2500 BC. The seal depicts a tiger beneath a tree and a man is sitting on the tree. Man-animal conflict undermines not only the law and order of the area but also the conservation prospects of India's large and potentially dangerous mammals such as the tiger (*Panthera tigris*). Such conflicts have become more frequent and severe in last few years which are the result of increasing competition for the available natural resources in terms of space or food. It is not always that every wild animal depredation will lead to man-animal conflict. Some depredations called silent straying remain un-noticed, some noticed but no conflict where as others result in conflict in terms of either crop raiding, property damage, cattle lifting or attack on human life. Killing, of either human or of the problem animal, is the ultimate expression of human–tiger conflict. In response to animal attacks on livestock or humans, local people are often compelled to persecute, hunt or poison them or create law order problem for the district administration Therefore, human–wildlife conflict is a major threat to the continued survival of wild animals; it reduces their numbers and erodes support for conservation. In Northern Kenya, the number of predators killed by farmers have been reported to be equal to the number of livestock killed by lions, hyenas and leopards (Ogada *et al.*, 2003). Kenyan pastoralists poisoned all the lions in Amboseli Reserve in 1990 and speared 27 out of 40 lions in Nairobi National Park in 2003. Pastoralists in Chad and in several districts of the United

Republic of Tanzania also poison lions (Packer *et al.*, 2006). Similar examples are not uncommon in India. It was reported that eleven persons were killed between 1979-81 by a man-eating tiger in the vicinity of Agrang beat of Manas Tiger Reserve. No compensation whatsoever has been paid in these cases. On the other hand, there is also the record of several aggressive retaliations by the villagers against the tiger. Even in 1976, a tigress was hacked to death by villagers near Bhuyanpara Range. One sub-adult tiger was found dead, half burnt near Narayanpuri in 1979. In 1984, on and off, there had been reports of a tiger entering cattle-sheds and poultry farms. However, proper reporting of such cases was not done. There might have been unreported killings of problematic animals by the villagers. Two tigers were clubbed to death by the villagers when they entered a fringe village and mauled several people in 1993. The poisoning of tigers in and around the Orang National Park in Assam by angry villagers has already resulted in the death of five tigers in 2007 and 2008. During the last five years, from 2005 to 2010, there is a report of three human deaths caused by tigers in addition to a number of cattle lifting. Recent poisoning of two tiger cubs in March 2010 in the periphery of Ranthambhore is the known case of retaliatory killings by the local communities. Possibilities of unknown retaliatory killings of tigers in past and present years cannot be ruled out. This negative attitude of the local communities towards wildlife originates due to their losses (including human life, property, crops etc) caused by wildlife can be non measurable and more severe than poaching. This negative attitude is directly related to the extent of tolerance level which varies from person to person, family to family, community to community depending upon the level of awareness towards wildlife conservation. In the United Republic of Tanzania, several villagers in the Rufiji district (which has experienced 92 lion attacks on humans since 1990) reported a high tolerance for lions because the lions helped to control the bush pig population (Packer *et al.*, 2006). In Malaysia when a tiger kills a person the official response is to kill tiger. But in India it is done when it is declared as man

eater. Again in Malaysia when a tiger kills a livestock then tiger is captured and put into the zoo. But this does not solve the problem. The vacuum created by the captured tiger is occupied by some other tiger. Problem remains and the result is loss of one more tiger from the wild. But it is not in India.

The decline in numbers of natural prey is one of the major reasons why carnivores shift their diets to livestock, which are easier to capture and have limited possibilities of escape (Mishra *et al.*, 2003; Patterson *et al.*, 2004). There are other reasons which play an important role in straying of animals in buffer areas or outside the forest area and include habitat constraint and sometime disruptive stimuli. In response to tiger attacks on livestock or humans, local people are often motivated to persecute, hunt or poison them. Therefore, human–tiger conflict is a major threat to the continued survival of tigers; it reduces their numbers and erodes support for conservation. The reluctance of local community to report incidents prevents conservation agencies for delivering an immediate and effective response and it stimulates the killing of tigers that benefits both hunters and livestock owners through the sale of tiger derivatives.

EXTENT OF THE PROBLEM

Between 1978 and 1997 Sumatran tigers *Panthera tigris sumatrae* killed 146 people and killed 870 livestock. Conflict was more in multi-use forests as compared to protected areas. Similarly in Royal Chitawan National Park, thirty-six tigers killed 88 people from 1979 to 2006. Most (66%) kills were made within 1 km of forest edge but equally in degraded and intact forests.

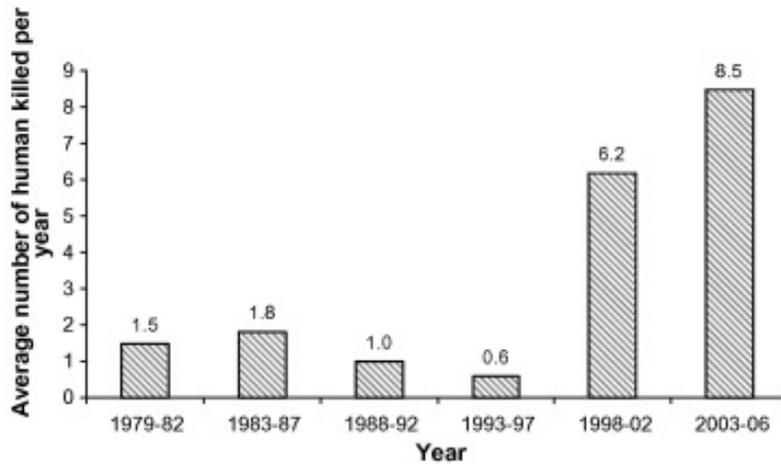


Figure 1

Average number of humans killed per year by tigers in and adjacent to Chitwan National Park, 1979–2006

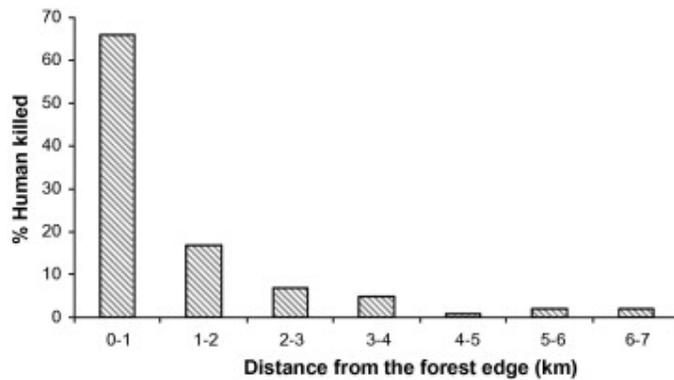


Figure 2

Percentage of humans killed in relation to forest edge in and adjacent to Chitwan National Park, 1979–2006.

In Bhutan 1375 livestock kills were reported and verified as having been made by tigers, leopards, snow leopards or Himalayan black bears between October 2003 to December 2005. Out of these, 966 (70%) livestock were killed by leopards, 263 (19%) by tigers, 114 (8%) by bears, and 32 (2%) by snow leopards. On May 28, 2003, a full grown majestic male Bengal Tiger did the same and crossed a human habitation of some 5km in one night and reached a village called Nalbunia under Chandpai Range. This particular tiger was within the forested areas under the Dhansagar Forest Station of the Chandpai Forest Range. The

existence of the tiger near the village was known to the forest officials. I presume it did stray a few times into the village bordering the forest. As the daylight broke on fateful Tuesday the tiger was finding it difficult to hide its massive body in the thickets of Nalbunia. Villagers spotted it and raised hue and cry and in that situation the tiger attacked and mauled a few villagers before taking shelter inside a sitting room of a villager. The whole village folk of several hundred people gathered with machetes, crowbars, choppers and other homemade weapons and killed the tiger in no time. The forest officials had the information and the ranger from Chandpai rushed to the spot but only after the tiger was dead. It was a rare opportunity for the villagers to kill and touch a tiger. Some started removing beautiful moustache, hairs from the tail and nail clippings thinking that these might have aphrodisiac values or simply to keep these as mementos. As a simple village living folks the villagers did the right thing. They killed a trespasser which is their traditional enemy. However, from the wildlife conservation point of view this was simply miserable. The custodians of the Sundarbans forest, the protector of the wildlife as per the Bangladesh Wildlife Preservation Act of 1974, the forest department has failed in saving a protected and internationally declared endangered species. It is easy to blame the state forest departments for all failures but we shall have to have consensus to stop such future happenings.

Between 1850 and 1950, 30,000 tribals and villagers were killed by tigers and 100,000 tigers were killed by man in India (Thapar, 2005). During 1877-88, 1635 persons were killed by tigers and 29266 cattle were killed by tigers (Jerry A. Jaleel in Under the Shadow of man-eaters: the life and legend of Jim Corbett of Kumaon)

Recent poisoning of two of the cubs (TM-45 and TM-46) of tigress TF-11 in Ranthambore Tiger Reserve in March, 2010 is an example of retaliatory killing. These examples are the ultimate expression of man-animal conflict which is undesirable for tiger conservation. In Bhadra Tiger Reserve it has been observed annually each household lost an

estimated 12% (0.9 head) of their total livestock holding to large felines. Compensations awarded offset only 5% of the livestock loss from 1996-1999. (Madhusudan, 2003). Table no.1 shows the reasons of tiger deaths in Kaziranga National Park from 2002 to 2009

Table No. 1

S.No.	Reason of death of tiger	No.
1	Old Age	12
2	Infighting	10
3	Knocked down by vehicles	4
4	Poisoning by villagers	2
5	Killed by buffalo	1
6	Unknown	13
	Total	42

So far more than 12 tigers have died in Kaziranga since November 2008 it has been again reported that one tiger killed with poison due to retaliation by the villagers because of cattle lifting.

The story published by Roopak Swamy in Indian Telegraph shows a similar story in Orang National park. The national park, has around 15 tigers at present. The park, which is called a miniature of Kaziranga, is situated on the northern bank of the Brahmaputra and has an area of 78.80 square km.

Table No.2

Table showing number of people killed by tiger in Orang National park

Year	No. of people killed
1990	3
1997	1
1999	1
2000	3
2001	1
2002	1
2004	1
2005	1
2006	3
Total	15

The poisoning of tigers in and around the Orang National Park by angry villagers has already resulted in the death of five tigers in 2007 and 2008.

Table No.3

Table showing the number of tigers killed in and around Orang National park

S.No.	Month	Year	Locality	Cause	Sex	Age
1	July	1996	Gariapathar	Bullet injury	M	8-9 years
2	Feb	2000	Bejimari	Poisoning	F	15-16 years
3	March	2000	Bontapu	Infighting	F	10-12 years
4	Dec	2000	Gandarmari	Natural	F cub	8 months
5	Jan	2003	Rongagora vill	Poisoning	F	8 years
6	Nov	2004	Solmari	Natural	F	6-7 years
7	Jan	2005	Nislamari	Natural	Cub	--
8	Nov	2005	Bhutiali	Poisoning	M	5-6 years
9	Nov	2005	Pachnoi	Poisoning	M	8-9 years
10	Feb	2006	Gaimari	Infighting	M	3 years
11	Feb	2006	Kachomari	Head injury	F	7-8 years
12	Nov	2006	Jahoni	Poisoning	Cub	3 months
13	Nov	2006	Jahoni	Poisoning	Cub	3 months
14	Nov	2006	Jahoni	Poisoning	Cub	3 months
15	Nov	2006	Jahoni	Poisoning	F	10-12 years
16	Oct	2007	Old Orang	Poisoning	M	3 years
17	Oct	2007	Old Orang	Poisoning	UK	3 years
18	March	2008	Hazarbigha	Head injury	F	5-6 years

In Sunderaban Tiger Reserve there are 544 human from 1975 and 1999 (Pioneer, Feb 18, 09) which has resulted a great resentment among the villagers resulted in retaliatory killings. It has been reported that at least 20 tigers have been poisoned to death and 10 died in accidents from 2005 to 2008.

DEALING WITH THE PROBLEM

It has been observed that it is not always that every wild animal depredation will lead to man-animal conflict- some visitors remains un-noticed (Category A), some noticed but there is no visible conflict (Category B) and others results in conflict in terms of either crop raiding, property damage, cattle lifting or attack on human life (Category C). As long as the

strayed animal remains un-noticed, there is no potential threat to man. But the potential threat starts budding when the presence of strayed animal is detected by humans and it culminates in conflict when cases of cattle lifting, crop raiding and injury to human being are reported. A story entitled “WII Sets Trees on Fire to Drive out Leopard” was flashed in the website of Sanctuary Asia in June 2010. The story goes like this-

“The Wildlife Institute of India, a premier scientific institution in Dehradun, chose to drive a leopard away because it had begun to regularly visit its campus to access water. Within the WII this has caused consternation, with most young scientists aghast that the faculty did not practice what it preaches to villagers. By removing scrub and setting fire to some trees in the process, exactly the wrong signal seems to have been sent out by the WII, which should ideally have monitored the leopard, while advising its own faculty, staff and students to take extra precautions while moving about the campus, particularly at night. Sanctuary will be focusing on leopards in its August 2010 issue and we welcome opinions from experts and others who are concerned about leopards...”

Here I would like to elaborate further. During the period I was holding the charge Registrar of WII who is also the estate officer of the area. The WII campus, having an area of around acres is surrounded all around by a wall which is porous at some places. The campus is full of luxuriant vegetation in the non residential area and also a Perennial Lake in that forest patch. Leopard was a regular visitor in the lake area of the campus but most of the time remained un-noticed and hence there was no crisis. This year in the name monitoring biodiversity a camera trap was placed in the nature trail which resulted in trapping an image of a leopard. Very next day the image was flashed on the internet of WII. Most of the students and faculty members including me were carried away with excitement and joy with the very thought that there is a leopard around. Just after few months I got instructions for placing the cage to capture the guest. Got confused, with a bit hesitation talked to my immediate boss about the issue and hinted him towards the consequent controversy. So far the leopard had not even growled at someone, then under what thoughts the Chief Wildlife Warden gave permission to local forest officer to capture the leopard. For the first time I was made to realise that I was also the estate officer of the campus. If something goes wrong I

will be equally responsible along with Director and Dean. And I was supposed to follow the orders. Trap cage was brought by the local forest officials and placed in the nature trail with one live bait. Crossing our fingers we waited for the same but it was not captured. There was a sort of resentment and a silent revolt in the campus was simmering but very few were hinting to the authorities. One evening two leopard cubs were also seen in the campus by a security guard. I immediately ordered to remove the cage and requested the higher authorities for taking matter to the State Forest Department. The much hyped so called leopard problem was flashed in the local media when while driving away the leopardess and her cubs from the thickets in the residential area two of the workers of institute got mauled by the irritated leopard. Subsequently the situation got worsened when situation resulted in to a sort of revolt by the students when the management was setting fire on the ground litter and the students of MSc were extinguishing fire just in front of them which resulted in heated discussion between them. I was out of the station, that evening only I came back and held discussions with the director and a meeting was called with CWLW Uttarakhand and decided to uproot some of the undergrowth in the residential area. Subsequently meeting with the faculty was also called. But the most challenging task was to take students along with the management. Task was given to me. So a meeting was called and most of the students and researchers participated. As expected I was bombarded with a series of questions about the ethics of the institute. Management was blamed of practicing different from what it preaches. Finally I asked them a question...

.....OK fine I agree with the theory of co-existence with leopard. We the forest officials, wildlife scientists, researchers, students and even the children of the campus may be sensitized enough to live with the leopard around. And we also know that there is no prey base in the campus. What will the leopard eat? You also know that our campus is surrounded all around by a number of villages. Definitely it will stray out in the nearby village and lift some small cattle or may attack children resulting into and man-animal conflict leading to law-order situation. In retaliation we may lose another wild animal. Where will your conservation efforts will lead to? Don't you think it was a wise decision on the part of management? Pin drop silence....

Students were advised be practitioner scientists instead of activist. A committee of students was constituted to give recommendations to resolve the issue. Somehow the students were convinced and the matter was resolved. This was an interesting case study that reveals how a Category A depredation was converted into Category B which took ugly turn to Category C depredation.

The second category of the depredation may result in their sighting but there is no conflict. In most of the interface areas there are hundreds of open wells which are like death traps. For example a tiger was rescued from an open well in Tezpur area of Assam in the year 2008. Similarly two striped hyenas were rescued in from an open well in Pratapgarh district of Rajasthan. But these are the known incidences. We don't know how many animals we are loosing because of these open wells. Why don't we construct a protection wall around such wells? Fund Problem? Why not through MNREGA? Even the owner of the well will be happy. The opell will be protected from siltation after the construction of wall.

It is the Category C depredation of carnivores, which always result in property damage, cattle killing, human injury or death should be viewed seriously. It will lead not only to law and order situation but also retaliatory killings.

Recommendations for dealing with Human-tiger conflict

Some of the measures namely, disruptive stimuli modification, raising tolerance through education and cultural perspective approaches should be dealt accordingly as the situation demands. The temporary displacement of the tigers from their regular territories due to excess of anthropogenic induced disturbances in their habitats can be the one of the reason of carnivore depredation in the fringe areas. Three fold strategies is recommended which

includes prevention of carnivore depredation (long term strategy), reducing man animal conflict (mid-term strategy), dealing with man-animal conflict (short term strategy)

A. Prevention of Carnivore Depredation (Long term strategy)

There can be any of the three or all are the major causes of carnivore depredation outside the protected area. These include habitat constraint, insufficient prey-base and increasing disruptive stimuli. I am taking the example of Ranthambhore Tiger Reserve where the suitable habitat for prey-base and consequently the tiger in whole of the RTR is confined to only in around 300 km² which is the core area itself, thus most of the prey base and tiger population is confined to this area. The recent reports of habitat occupancy by five tigers in Sawaimansingh Sanctuary of RTR for more than one year, clearly proves the lesser space in Ranthambhore National Park. Prior to 2004, extensive works on protection and habitat improvement with the help of closures and plantation activities including construction of soil and moisture conservation structures were started in the area that was affected with rampant grazing, lopping and felling of trees. Though the prey base in Sawaimansingh Sanctuary is considerably low but it is the reduction in disruptive stimuli due to protection efforts on one hand and habitat improvement with the help of silvicultural operations on other hand that has helped in settling of tigers in the area.

As per the report on All India Tiger estimation done by Wildlife Institute of India in 2005, there is drastic reduction in number of tigers in different reserves of the country. It is worth interesting to look in to the trend of number of tigers straying outside should have decreased accordingly. But in contrast the reports of incidents of straying tigers increased considerably. If we see the behaviour, the tiger is elusive in nature and wary of human being which is a condition present only in inviolate areas where there is less human presence. Then

why tiger is moving out in human dominated landscape? Answer is the tiger is not finding any difference both out and inside in turns of human presence. Earlier in the name of disruptive stimulus there were only poor local villagers with axes or sticks in their hands who use to run away the moment they saw a tiger. Now they have been replaced with growing number of visitors in jeeps and jypsies with cameras in their hands who continue to remain around the tiger the moment they see him. This new disruptive stimulus (disturbance) in the form of unregulated tourism is perhaps removing the differences between in and outside the PAs for tigers.

Habitat improvement and reduction of disruptive stimuli

- Seeing the positive results due to silvicultural practices and continued protection efforts by the department in Sawaimansingh Sanctuary in Ranthambhore Tiger Reserve, it is highly recommended that such type of activity should be repeated in other buffer areas in mass scale.
- Raising a physical barrier in the form of 6 feet wall at interface which is not movement corridor of the tiger.
- There is a need of scientific monitoring and management of waterholes which include making an inventory of all waterholes in the reserve and making a comprehensive plan for their monitoring.
- Relocation of all of the villages from Protected Areas.
- There is an urgent need of regulating tourism in most of the National Parks of the country. May be revisiting the carrying capacity of the National Park and also looking other possibilities of developing eco-tourism activities.

Identification of 'predation hotspots'

- Look at the past cattle lifting record
- Identify predation hotspots
- Mapping the geographic distribution of cattle kills in relation to ecological variables and temporal periods
- Map them on GIS scale
- Temporary check posts to be created in those hot spots

Tracking dispersing tigers through telemetry

Dispersal is the permanent movement an individual makes from its birth site to the place where it reproduces or would have reproduced if it have survived and found a mate (Howard, 1960). Naturally, juveniles and sub-adults are the dispersers. Often, cubs between the ages of 18 to 24 months, who look almost like adult tigers, disperse (Karanth, 2001). They are called transient floaters and keep on looking for vacant territories. When they don't get any space, they move out to venture into new areas, which is "frustrated dispersal" (Mel Sunquist, 2005 pers. comm.). Consequently, the chances of their survival diminish outside the protected area as most of them succumb to poisoning or snares lay by the skin mafia or become man eater under some circumstances and are eventually either shot down or transported to some zoo. The very recent killing of four people by a young male transient that strayed out of the forests in Pilibhit district in Uttar Pradesh has compelled the Government to order a shoot at sight of the same (TOI, Jan17, 3009). Similarly two known and famous records of straying young tigers from Ranthambhore are there. The young tiger who died in a train accident in 2003 on the rail track that passes through present Mukundra Hills National Park was one of the male cub (popularly known as Broken Tail) of first the litter of tigress of Rajabag area of Ranthambhore National Park. Another example I would like to quote is of one transient male cub of Berda tigress that strayed out of the National Park and killed one

villager of Mai Kalan in February 2005. In true sense it is only the tigress that has fixed territories. The male who keeps on looking for the different females travel long distances in territories of few tigresses, thus the males have territories which are elastic and overlapping in nature. The movement of tigers outside the national park is common behaviour, as just after separation from their family, they disperse looking for new territories or for females. Tiger needs large and undisturbed landscapes with sufficient prey-base to raise young and to maintain long term genetic and demographic viability (Seidensticker and McDougal, 1993; Karanth and Sunquist, 1995; Carbone et al, 1999). For managing dispersing tigers following strategy is hereby proposed:

- Identification of the dispersing tigers
- Radio-collaring the identified tigers
- Deploying staff for monitoring individual dispersing tigers

B. Administrative Action

1. Need for the improvement of Intelligence network

At present problem is that who get the information first when a tiger strays outside? A poacher or a forest officer? This is the major problem that we are neglecting. We have to improve our intelligence network. Why there is no provision of rewarding the informer for-Tiger presence? -Natural prey base kill? -Cattle kill? When tiger/leopard strays outside who gets the information first- FD or poacher. Regarding the presence of tiger, who should get the information first, it, has to be decided by the state govt. There is again an urgent need of recruitment of the fresh frontline staff to fill up the vacant posts. Frontline staff has to work on three shift basis of eight hours each.

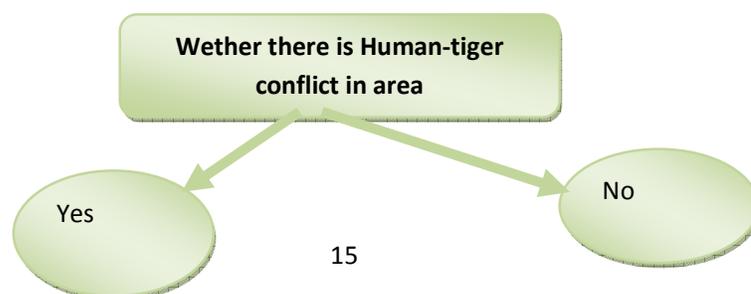
2. Cattle Compensation Schemes

The cattle compensation schemes in different states of the country are not effective. The amount of compensation is far below as compared to the market value. Moreover the time of disbursement of the compensation is so slow that by the time amount is paid the victim might have approached a poacher for retaliatory killing. Mechanism regarding compensation disbursement is to be designed in such a way that helps in increasing the tolerance level towards the damage by the affected communities and prevent them taking direct action by themselves and includes, sufficient compensation which should be given in time.

3. Preparedness to deal with the situation

Almost all of the wildlife and territorial divisions of the country should be well equipped with animal immobilization equipment (Drug delivery projector), drugs tranquilizers (valim), sedatives (xylazine), dissociatives (ketamine) and narcotics (etorphine HCl for big animals), reversal drugs (Yohimbine HCl for xylazine and revivon for etorphine) trap and transport cages qualified and wildlife trained veterinarian. It is not possible to have qualified veterinarian in each of the divisions but at least one of veterinarian from a district headquarter should be trained. Similarly at least one forest officer not below the rank of range officer should be trained and authorised for immobilising problematic animals.

Decision making in dealing with Human-tiger Conflict



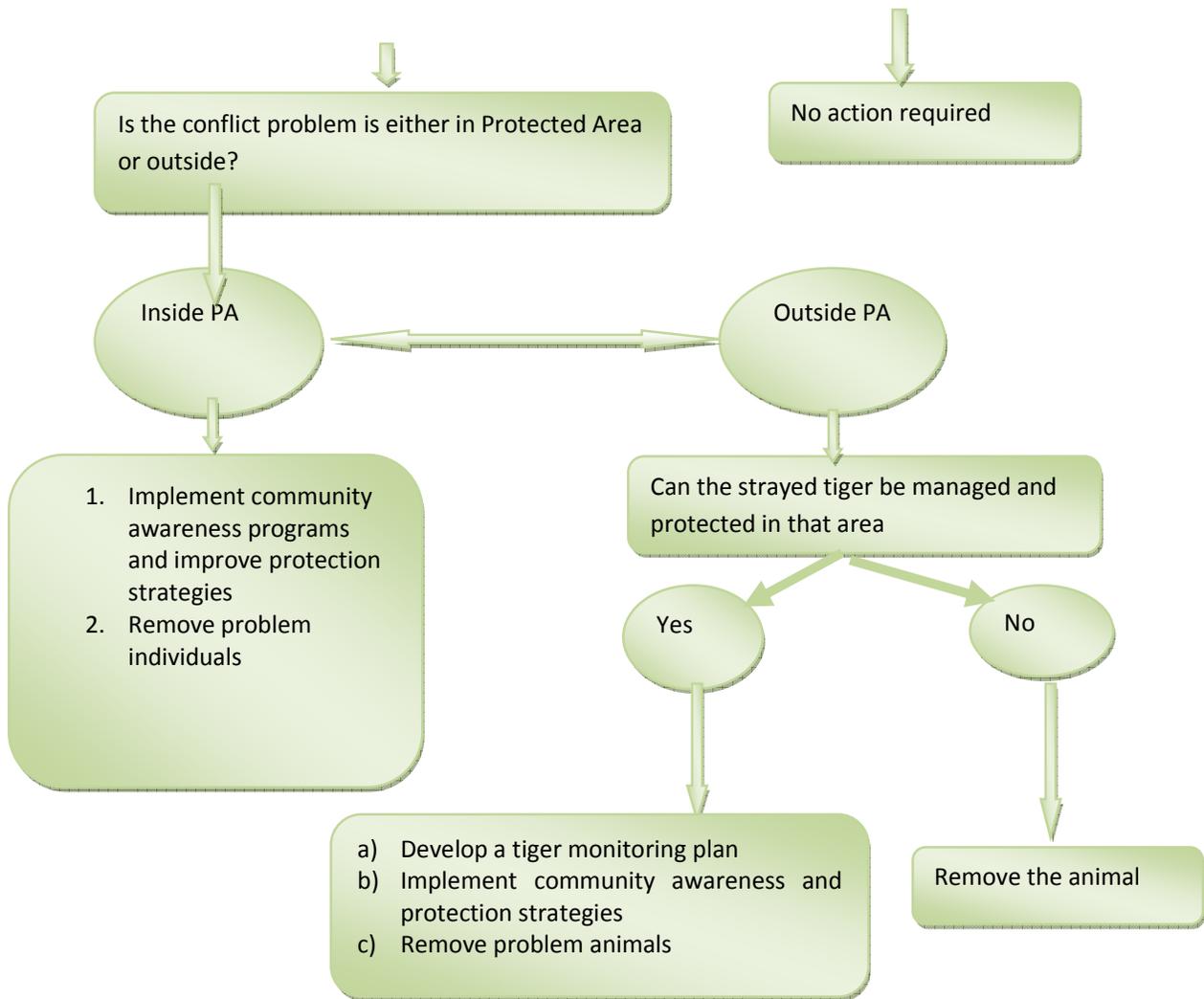


Figure no. 3 Flow chart showing types of response to be undertaken by a resource manager during different circumstances.

This last paragraph should be read by the policy makers very clearly and decide accordingly. How can the forest manager balance the demands for forest resources, including wildlife and still maintain a sustained yield of ecosystem services? How the needs of all wildlife can be considered? As these problems are pondered, the forest manager is likely to discover the wisdom of two of Commoners (1971) laws of ecology. First, everything is connected to everything else and second, there is no such thing as free lunch.

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