

# **Human Conflict with African and Asian Elephants and Associated Conservation Dilemmas**

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## **Abstract**

This paper reviews the sources of conflicts of Asian and African elephants with people. We describe the behavioral patterns associated with crop raiding and attempts to prevent and mitigate the damages. Although some cultural differences across Africa and Asia affect the approaches used to resolve problems, conflicts arising from the sheer size of the animals result in similar overlapping issues. In both areas the economic realities of elephant damage create a dynamic problem without a clear solution, despite the wide range of attempted methods. In the larger issue of public policy regarding land use, conflicts with elephants in fact are simply one prominent aspect. Elephants compete with humans for water, food, and space. While elephant and human populations escalate, agricultural lands expand and habitat for elephants dwindles, resulting in an expansion of the elephant/human interface (Kiiru; R.F.W. Barnes; Tchamba; O'Connell et al.). The expansion of this interface has resulted in heightened elephant/human conflict, requiring difficult management decisions concerning how to accommodate both elephants and humans. In this paper, we summarize the status of the elephant/human conflict

interface in both Asia and Africa. We discuss how and why the conflicts differ or remain similar between case studies, and how complex social perspectives on wildlife and parks can confound or ameliorate attempts to resolve the problem depending on current management practices in each case. Examples are drawn from our experiences in India and Nepal (LAH) and the Caprivi region of Namibia (CEO).

## **Introduction**

The conflicts that humans experience with both Asian and African elephants are often similar. Both species of elephants migrate seasonally to follow the availability of water and preferred foods. Their migration patterns often extend not only beyond park or reserve boundaries, but national boundaries as well. This is true, for example of the Caprivi region of Namibia and the Chobe region of Botswana (Craig; Rodwell et al.). Because elephants move great distances, it is difficult to confine them to small parks. Even with fences, farms adjacent to the park boundary are likely to be raided, especially during seasons when favored foods are at the optimal stage of growth. Inevitably, the sharpest conflict and greatest losses seem to occur to these park-bordering villages (Naughton-Treves; O'Connell et al.).

A major philosophical issue is the degree to which humans and elephants compete with each other for bare survival, i.e., to avoid starvation, versus an impact of elephants on the economic welfare of humans where no starvation is at stake. In the former case where starvation is a possible risk, there appears to be no solution other than weighing human life against the potential extinction of a species. Fortunately, this usually does not seem to be the situation. In the case of economic impact, there needs to be a way for people who are losing resources to elephants to instead gain some compensation by limiting the destruction by elephants and/or

allowing people with losses to gain from elephants' presence. This is the current focus of attempts to resolve the issue and is the topic of this paper.

## **Elephant Damage, Costs and Mitigation**

There have been many studies documenting the behavioral patterns of elephant crop raiding in both Asia and Africa (Sukumar 1989; Damiba and Ables; Hoare; Kiiru; O'Connell et al.), and the estimated costs of the ensuing crop damage (Bell and McShane-Caluzi; O'Connell et al.). Some studies have explored viable options to deter crop raiding elephants (Sukumar 1989; Hoare; Osborn and Rasmussen; Thouless and Sakwa; O'Connell et al.). We review some of these studies to determine whether an overall pattern emerges as to the nature of the conflict and the means with which to resolve them.

Understanding the herd composition and raiding patterns of elephants causing the most damage can provide useful information for developing methods to repel crop raiding elephants. Studies from Southern India (Sukumar 1989, 1990) serve as a model of the type of information that is needed. Crop raiding was seasonal, peaking October through December, following the cultivation of millet. Generally elephants entered the cultivated land only after sunset and left before sunrise. The raiding from crops accounted for a much larger proportion of the diet of adult bull elephants than of family herds of females and young. Thus, bull elephants had a great impact on crops, even though they commonly traveled alone, exerting far more damage than even a herd of several female elephants. Crop raiding was habitual for some adult bulls. The attraction toward the crops was increased by the availability of water, which is relatively scarce in some seasons. Even elephants with a surplus of natural food resources resorted to crop raiding, presumably attracted by the greater palatability and food value of the cultivated plants.

Thus, the raiding in this area was not an indicator of food availability or impending starvation of the elephants.

In addition to monitoring the behavior of the elephants causing damage, careful documentation of the economic losses is essential to assess the extent of damage. This involves monitoring the crops and their values at each season. Methods for assessing damages generally partially rely on indirect information supplied by local people, some of whom may have a vested interest in exaggerating the extent of damage. For this reason, a system of following up a claim is an important step in getting a true depiction of the problem (O'Connell et al.).

Crop damage due to elephants in the Caprivi region of Namibia fluctuated monthly, seasonally, and annually, depending on elephant movements, rainfall patterns and crop quality, though conflicts peaked approximately three months after the peak in rainfall during the period from 1991-1995. Although lion predation on livestock accounted for the most economic damage to farmers in the region, elephants accounted for the greatest frequency of conflicts. The worst conflicts occurred in villages that bordered protected areas with very high densities of elephants (O'Connell et al.).

In desperation, Asian and African farmers attempt to drive elephants from their fields by beating drums, using firecrackers, or even burning the animals with lighted torches, or shooting in the air (Sukumar 1989; Cheeran and Poole), traditional methods that formerly were successful in locations such as Namibia (O'Connell et al.), Kenya (Ngure), Cameroon (Tchamba), Burkina Faso (Damiba and Ables), and Southern India (Sukumar 1989, 1991). With increasing density of elephants, shrinking habitat, and more frequent conflict, elephants have become more aggressive, and, necessarily, more technical and systematic methods have been tried and monitored for their effectiveness. Initial methods to prevent damage focus on excluding elephants from the area,

either by fencing, electric fencing, or excavated barriers (Sukumar 1989). Digging steep sided trenches reduces the access of elephants for a time, but they soon create bridges for access. In some cases the trenches are concrete lined, as has been a convention in some zoos. However, such robust constructions are not practical or feasible considering the lengthy boundaries of parks.

Selective culling, translocation, electrical fencing and other more advanced elephant crop raiding deterrent techniques have been attempted (Sukumar 1989, 1991; Thouless and Sakwa; Kangwana; Hoare). Studies in the Kwando region of the East Caprivi indicated that the effectiveness of electrical fencing, trip-alarm techniques, or elephant warning calls depended on various factors, including the frequency of exposure of elephants to the deterrents, maintenance of the deterrents, and other complex social factors of both humans and elephants (O'Connell et al.). Short term methods such as trip alarms (O'Connell et al.) and chili bombs (Osborn and Rasmussen) are important to ameliorate immediate problems. Electrical fencing seems to be the only long term viable solution, however, without high maintenance and punishing fence breakers, even this method is not likely to be successful (Thouless and Sakwa; O'Connell et al.). Habituation of elephants to crop deterrents threatens the long-term success of any method.

Human cultural differences between Africa and Asia affect the contrasting approaches used to resolve the problems. The Buddhist religious tradition, for example, in India, prohibits killing elephants (even for humane reasons). Thus, killing elephants to harvest their ivory, or to remove problem animals, is not an option. On the other hand, capturing animals and training them to work is a long tradition that utilizes the advanced cognitive abilities of elephants and their facility in participating in a partnership and regular daily routine of work (Hart; Krishnamurthy and Wemmer). Although capture of elephants is generally prohibited in most

areas today, young animals born in captivity or problem animals are still trained to do work within government elephant camps (Hart and Sundar).

A confounding issue in human/elephant conflicts in both Asia and Africa is the question of ownership. In Southern India, many elephants are owned by the government, and domesticated elephants and wild elephants to a limited extent are managed by the Forest Department. Mahouts working with domesticated elephants are employees of the Forest Department. However, elephants also can be privately owned, or owned by temples and used for ceremonial processions. Similarly in Kenya, elephants are regarded as belonging to the government, even while entering the private property of someone's ranch for extended periods (Cussins). However, David Western has worked with Maasai tribespeople in Kenya to develop and advocate a community-based pattern of ownership (McRae). This is similar to the practices in some regions of Southern Africa, where rural communities are given conditional rights over wild elephants within a conservancy policy (Jones; Chafota). In these areas, elephants are viewed as an economic asset, where products such as ivory and meat are used for the economic benefit of the local people when the elephant dies, or is killed in an arranged hunt or culled due to causing problems to farmers (J.I. Barnes 1996; Lewis and Alpert).

In order for farmers to be willing to sacrifice their potential earnings from crop and livestock production for the benefit of elephants, they need to experience some economic benefit from the elephants. Nonconsumptive uses such as tourism viewing in Botswana account for considerable economic value, which would be increased (34-59%) by also including safari hunting (J.I. Barnes 1996). In 1992 following the ivory ban, tourism viewing accounted for 71% of the economic value of elephant use. It was concluded that with the human population doubling every 30 years, wildlife areas that do not contribute to human economic welfare

inevitably will be converted to uses that directly contribute to human development. One problem is that the safari hunting and cropping would create displacement of the elephants and disturbance of the tourists, potentially lessening the economic benefits of the tourism viewing. Tourists strongly value the experience of being in wilderness when they are viewing wildlife; uses such as safari hunting, wildlife ranching or farming erode the value of the area for high-spending tourists (Barnes 1998).

A search for methods for the animals to be of economic benefit to the people has led to proposals that community wildlife conservancies, such as Campfire in Zimbabwe, receive benefits from the economic use of elephants through hunting or culling (Jarvis and Larson). Models have been constructed to compare the effects of establishing property rights for local communities over their elephants with countries where there are poor property rights or open access. Analyses of these models have lead to the conclusion that property rights and permissive trade in elephant products are supportive of elephant survival (Hertzler and Gomera).

### **Alternative Methods to Promote Elephant Survival**

Considering the shrinking habitats, and the declines of Asian elephants both in the wild and in captivity, serious proposals have been made by respected animal welfarists that they should be bred more efficiently in captivity and perhaps domesticated on a wider basis (Cheeran and Poole).

The tradition of using elephants for logging is still widely practiced in Myanmar (Burma) where an estimated 5,700 elephants remain in use (Schmidt). Although captive, these elephants, as with those in Southern India (Hart and Sundar), are hobbled and let loose in the forest to feed, providing them a natural diet. Working bulls sometimes encounter and conflict with wild bulls

or other working bulls; thus, most working bulls have suffered injuries to their tails (Krishnamurthy and Wemmer). The domesticated elephants cared for by mahouts have an excellent tradition for appropriate daily activity (Cheeran and Poole), whereas captive elephants that are tethered for long hours become bored and develop behavioral problems (Schmid). The elephants appear to enjoy work and participation in religious processions; one drawback is that they sometimes may be overworked. A related proposal was put forward for African elephants, to domesticate them for work (Kiley-Worthington). In her criticism of the South African wildlife parks, she deplores 'wildlife apartheid', where humans are separated from the rest of the living world, and proposes an integration of wildlife conservation, food production, agriculture and development. Yet another approach would be to pay farmers for keeping or permitting elephants to be on their lands, rather than hiring guards and enduring repetitious trauma (Sutton).

## **Conflicts Associated with National Parks: Perspectives on Public Policy Regarding Land Use**

Some of the most contentious and challenging issues such as how and where to place national parks and what type of access to allow in the parks, derive from the environmental impact of elephants. Asian elephants conventionally lived in forests, a habitat that has been catastrophically

shrinking in recent decades. For example, in India between 1972--75 and 1980-82, one-sixth of the forest cover was lost, or 1.3 million hectares every year (Choudhury). A further problem in attempting to make wise decisions is accurately monitoring the elephant status in forests, where it is extremely difficult to acquire accurate counts of elephants, as shown in extensive studies in



central Africa (Barnes et al). Roads and human presence were demonstrated to adversely impact the animals.

The decision to establish a park where cultivation and grazing is prohibited generally has required removal of some people who traditionally used these lands. Even many years later, it is common for there to still be an uneasy peace in which the local people feel that they are being deprived of something that is theirs. In some cases the local people are provided with farmland carved from former elephant habitat, sometimes reducing the size of the park. The forest is then cut to establish farmland, reducing what was the traditional habitat of the elephant. Later, the boundaries of parks may be whittled down, as, for example, in Southern India and Rwanda, to gazette new farms. In the competition for land and for firewood and wood to construct homes, elephants use resources that are desired and needed by the local people; the process of park establishment and pastoralization reduces the land available as a grazing commons (Yeager and Miller).

Wildlife accounts for only part of much larger sources of conflict concerning uses of the protected habitat. National park boundaries demarcate a zone where the use of natural resources is either controlled or forbidden. Inevitably, conflicts arise when people who traditionally use that space are prevented access to resources (Norton-Griffiths; Vandergeest). Ideally, the affected people would have participated in the planning process for establishing the park, or been offered access to some alternative resources that would substitute for the traditional lifestyle (Lewis and Alpert). Historically this has generally not been done (Yeager and Miller; Sibanda and Omwega). As an example of types of problems that arise with park establishment, five major causes of park-people conflicts have occurred in Nepal's Royal Chitwan National Park, despite the lack of wild elephants. Illegal taking of forest products, livestock grazing in the park,

illegal hunting and fishing, crop damage, and threats to human and animal life caused by wild animals from the park all contribute to a diverse range of park-people conflicts (Nepal and Weber). The Nepalese Tharu people living in the Terai region near the boundaries of the Royal Chitwan National Park utilize 62 different plant species as food, 36 species as building materials, and 63 species as medicines (Muller-Boker). They traditionally relied on trees and grasses within the current park for building their homes and cutting forage for their livestock. Despite being permitted a few weeks of grass cutting each year, most people living near the Park view wood poaching from it almost as a necessity. Even lacking elephants, they are antagonistic to wildlife conservation from their experiences with rhinoceros, wild pig, and chital deer. Another study attempted to find solutions to the sharp conflict between the local people and the Chitwan National Park staff concerning the grazing and fodder needs of the local people (Sharma and Shaw). Oxen and buffaloes provide the traction power for tilling and transporting materials; almost half of the fodder for these animals comes from public forests. If more trees became available to the local people, they reported they would increase their numbers of animals, rather than reducing their trespassing into the Park. Thus, their use of resources appears based on a desire for economic growth, not on simply maintaining a subsistence level.

In Kenya similar conflicts have occurred within national parks with the Maasai people continuing to graze their cattle within the parks, as has been studied, especially in Amboseli (Yeager and Miller; Cussins). Even excluding the problems that occur with wildlife, there is contention over the access to wood, grasses, and sometimes water, within the park. Whereas lack of water previously limited sizes of herds, the Maasai have increased their numbers of cattle as boreholes have become available. This sets the stage for exacerbated frustration when wildlife, such as elephants, intrude on the farms and destroy crops of local people.

Current views on conservation and rural development are polarized between the primary priority being conservation biology, in which parks are established to protect wildlife in the exclusion of humans, or rather emphasizing social ecology, where resources are seen as one component in a natural system which incorporates human communities. A perspective from India is that social ecology is a science of biological conservation, where mature societies have evolved cultural and resource practices that lead to a sustainable use (Sarkar). A weakness of this theory is that traditional sustainable use may reflect human population size more than representing an inherent tendency toward sustainability. The inherent lack of recognition of human behavioral patterns regarding the use of natural resources results in inappropriate management designs (Heinen). Without understanding these patterns, and incorporating them into management plans, conservation efforts are likely to fail (Vandergeest).

The dynamic tension between the perspectives of conservation biology and those of social ecology plays out politically on the international scene, as well as locally where the conflicts occur (Cussins; Sarkar). The specifics and history are unique for each particular circumstance and locale, yet discussions often address all Southern Africa or Eastern Africa or Asia, implying that a single solution could be found for each large region. The likely prospect is that, at least in some areas, the elephant population will continue to increase, resulting in more dispersal into areas surrounding parks, where a growing human population resides, creating more acute conflict (Chafota).

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