Are Conservation Funds Degrading Wildlife Habitats?

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There has been increased funding for wildlife conservation efforts in recent years. These funds have largely been spent on “habitat improvement” activities. In the absence of a scientific evaluation of such activities, inappropriate management of landscapes has led to human-wildlife conflicts in certain areas. Moreover, funds are being used for construction of conservation structures, forest roads and planting of exotic tree species without assessing the resulting adverse ecological effects and the gradual degradation in the quality of wildlife habitats.

The goal of the Imperial Forest Services in India, formed in 1864 under the German and French models, was revenue generation through sustainable forestry and game management (Beinart and Hughes 2007; Gadgil and Guha 1992). It aimed at meeting timber demands for ship building, railway supplies and coal demands of the colonial empire. These strategies and production forestry practices were continued post-independence. However, since the early 1970s, conservation management took precedence over revenue generation forestry. Policies were formulated and implemented to enhance the protected area network and reduce threats to wildlife, which would result in augmenting wildlife populations.

This change in management policy led to success in conserving large-bodied, ecologically sensitive wildlife species, some from the brink of extinction, such as the tiger, Asiatic lion, elephant, one horned-rhinoceros, lion-tailed macaque, brow- antlered deer and others. This success has been impressive, and gains importance given the poor results in other Asian countries. A critical aspect of this conservation success story has been the support of a dynamic political leadership and a committed bureaucratic set-up that focused on priority conservation policies. Enactment of stringent laws, establishment of protected areas and other important protection measures were accorded precedence.

However, currently wildlife conservation is going through a difficult phase due to a burgeoning human population, rapid economic growth and other factors. Direct extermination of large carnivores for international wildlife trade, hunting of prey species for local consumption, large-scale habitat loss and chronic threats such as human-induced forest fires, commercialisation of forest products and timber smuggling have largely contributed to the list of threats to wildlife conservation. In most protected areas where threats persist and wildlife populations are far below their biological carrying capacity, shortage of staff and a severe crunch in funding have been cited as the two most important limiting factors in achieving the goal of wildlife conservation (TTF 2005).

Funding Wildlife Initiatives

After the Sariska debacle (when it was discovered that there were no tigers left in the reserve), there has been augmented funding for wildlife conservation efforts, in particular by the central government. These funds are mainly routed through the National Tiger Conservation Authority (NTCA), centrally-sponsored schemes such as the Integrated Development of Wildlife Habitats under the Eleventh Five-Year Plan, Project Elephant and various others. Most tiger reserves have established tiger foundations through which the tourism revenue generated in the tiger reserves are retained with the reserve authorities giving flexibility to spend the funds locally.

Further changes in government policies have opened up new funding avenues for protected area management. Compensatory Afforestation Fund Management and Planning Authority (CAMPA) receives monies collected from user agencies for diverting forest lands for non-forestry purposes, and these are to be used for managing wildlife habitats (MOEF 2009). Recently, the government has released about Rs 818 crore to 23 states under CAMPA (PIB 2010). Following the implementation of the National Rural Employment Guarantee Act (NREGA), rural development funding is also made available for the same purpose. For instance, during the fiscal year 2009-10, Karnataka allocated Rs 300 crore under NREGA to the forest department, part of which has been utilised for wildlife habitat management (MOEF 2009).

Financial support from external, multilateral donor agencies has been drawn for wildlife conservation since over a decade. During the period 1996-2004, India availed of a loan-cum-grant of about Rs 2,440 crore from the World Bank and the Global Environment Facility (World Bank 2004).

A major part of this funding is spent on activities such as creation/development of artificial water harvesting and retaining structures (water tanks, check dams), soil and moisture conservation structures.
(rainwater harvesting pits), construction of forest roads, creation of salt licks, bamboo silvicultural operations and other similar activities which are broadly termed as “habitat improvement”. Protected area managers invest substantial amounts of time in meeting targets of these habitat improvement activities.

Human-Wildlife Conflict

Prey poaching, direct extermination of tigers and large-scale habitat loss have been identified as serious threats to tigers (Karanth and Stith 1999) and other endangered wildlife. Other serious issues including habitat manipulation and degradation may have critical effects on animal populations directly or indirectly. Impacts of habitat degradation due to modification of natural landscapes may not be as instantly obvious as the former. This is largely due to the fact that responses of animal communities to such threats can be slower compared to direct threats such as hunting. A scientific assessment of such wildlife habitat management is absent in the country. In this context it is vital to scientifically evaluate the efficacy or effects of the habitat improvement activities undertaken, even though serious irreversible damages might have already been caused due to the habitat improvement activities.

For instance, scientific studies in Africa have demonstrated that extensive construction of artificial water holes, water retention dams and other water-harvesting measures reduce natural calf mortality of elephants which occurs due to shortage of resources such as water (Owen-Smith et al 2006; Smit et al 2007a, b). Hence, providing additional resources artificially augments elephant population beyond the carrying capacity of an area, forcing the elephant population to include human-dominated landscapes as part of their foraging range. It was also noticed that spatial clustering of water holes increases availability of surface water in an area, leading to homogenisation of foraging regimes and compromising the variation in ecosystem in the landscape (Smit et al 2007a). This affects seasonal movement patterns of elephants, again leading to higher conflict in certain areas. This demonstrates that there could be a direct correlation between human-elephant conflict and an artificial increase in surface water availability.

Inappropriate management of elephant landscapes in the name of habitat improvement could be one of the reasons for the increased human-elephant conflict in and around some protected areas (Gubbi 2009) in Karnataka. There has been a steep increase in crop damage, loss of human life, and human injury in elephant-bearing forest circles of Karnataka. During the period 2005-09 there have been a total of 60,219 reported cases of human-wildlife conflict, largely due to elephants due to conflict-prone wildlife species, the forest department faces the wrath of local communities when control on resource and biomass extraction from wildlife habitats is exercised. As a result, field staff faces stiff opposition in implementing regulations. This leads to over-harvesting of resources leading to further depletion of food resources for wild herbivores. Hence degradation of wildlife habitats has a direct and/or indirect relationship with human-wildlife conflict, loss of public support and higher extraction of natural resources – a cycle that many times turns violent making wildlife conservation a socially problematic business.

Ecological Effects: Western Ghats

Construction of rainwater harvesting and moisture conservation structures finds no justification in the Western Ghats forests. These forests receive up to 8,000 mm of annual rainfall (CEPF 2007) and water
retention is one of the ecosystem functions performed by forests naturally (Costanza et al 1997). In some forest areas, native secondary vegetation including shrubs, herbs and tree seedlings have been physically removed in the name of “weed clearance” under the NREGA. This will have an impact on the overall structure of forest composition with no seeding recruitment for years. This change in vegetation dynamics and microclimatic conditions will result in loss of nesting sites for birds that nest in shrubs, bushes and on forest floor, upsetting the ecological balance and cycles. This also results in loss of habitat for ground dwelling amphibians, reptiles and insects.

Observational evidences show that following the “weed clearance”, exotic plant species such as gliricidia sepium have been planted to “control soil erosion”, again, using rural development funds to fulfil the 100 days employment guarantee.

Natural grasslands (termed as “gaps” in forestry terminology) in the Western Ghats are planted with the exotic acacia auriculiformis that are native to Australia, Papua New Guinea and Indonesia. While planting of exotic tree species have a set of effects on the natural forests, the grasslands that provide the much required forage for large herbivores are denuded by bringing in alien vegetation. Conversion of natural forests and grasslands into monocultures of exotic tree species interferes with natural succession of local tree species, depletes water resources, reduces biodiversity richness (as these trees do not produce edible fruits), lowers soil fertility due to non-degradable leaf litter and non-existence of humus-dependent taxa (Sangha and Jalota 2005; Sukumar et al 1995; Wilk and Hughes 2002).

**Forest Roads: Bandipur Reserve**

Similarly, excessive investment in the construction of forest roads will have its own ecological impacts such as fragmentation, spread of invasive plant species and other effects. The geographic information system analysis shows that the four tiger reserves in Karnataka have a high density of forest roads (around one km of forest road per sq km of forest, Table 3 and Figure 1) as seen in 2008. This network of roads swells in tourism zones. The tourism zone in Bandipur Tiger Reserve has 2.25 km of road network per sq km of forests, and the road density is so high that the distance between one road and another is less than 50 m in some places (Prasad 2009).

A study of the Bandipur Tiger Reserve has evidently shown that forest roads facilitate the spread of invasive plant species such as lantana camara that exert edge-effect on native biodiversity, vegetation in particular. Lantana is widespread and abundant along roads compared to forest interiors and it comprised over 75% of the forest understory along forest roads and clearances (Prasad 2008). Lantana was also found in abundance in other clearings created for habitat improvement purposes such as fire lines, water holes and salt licks (ibid).

The spread and dispersal of other invasive plant species such as chromolaena odorata and parthenium hysterophorus that are unpalatable by wild herbivores are all facilitated by road construction work. This reduction in habitat quality for wild herbivores results in their seeking refuge in nearby agricultural fields for fodder, increasing human-wildlife conflict.

Exotic invasive plant species severely affect ecosystem structure and functioning. They reduce the richness of native plant species and suppress regeneration resulting in decreased availability of fodder for wild herbivores. Global reviews of invasive plant species also suggest that they use excessive amounts of resources (notably water) and play a major role in altering nutrient availability (Bhatt et al 1994; Kunwar 2003; Richardson and van Wilgen 2004).

Formation of forest roads and view lines for tourism purposes are also found to be responsible for loss of native tree species in Bandipur. The road clearings formed distinct edges that increased tree mortality via changes in microclimatic conditions. Tree deaths within and along forest roads were higher by 250% compared to forest interiors (Prasad 2009).

Though roads are important for management and monitoring, they need to be minimised. The current network of roads from the four tiger reserves in Karnataka demonstrates that formation of new roads is unessential and will affect ecosystem functioning and in turn wildlife populations. Under the increased funding system these roads are formed using heavy earth moving equipment such as excavators,
dozers and other vehicles (Gowda 2010). The constant movement of heavy machinery within the protected areas severely disturbs wildlife.

Apart from the ecological effects, there are other indirect impacts on ground protection activities. The wildlife wing of the forest department is highly under-staffed and diversion of focus and time of staff, especially field personnel, from protection activities to these construction-oriented civil works will seriously affect their core duties. This can directly lead to higher poaching, timber smuggling, increased forest fires and other similar threats detrimental to wildlife conservation.

Policy Shift Required

In the context of the argument for forests free of incompatible human uses, the concept of “habitat improvement” needs rigorous evaluation. Further funding for such activities should be rooted in sound ecological evaluation, ecological benefits and understanding of ecosystem functioning rather than on ad hoc decisions based on annual budgetary allocations.

Conservation management is different from management for revenue generation. In this paradigm, the goal is towards augmenting wildlife densities, or maintaining existing levels where animals have reached their biological limits based on available ecological parameters. Hence, the utilisation of funds and focus of conservation management should be on threat mitigation which needs to be accorded priority over habitat management. The latter can follow after the primary concerns of wildlife conservation are met. Hence, the sequence of management needs to be reversed.

Behavioural ecology and population dynamics have been the focus of scholarly work in wildlife science. Scientific studies that look at habitat management issues are few and far between in India. Wildlife science needs to refocus on subjects that will answer such crucial habitat management issues. Otherwise, science will continue to be ignored for not being useful for issues in management.

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