

The 'Tiger Crisis' and the Response: Reclaiming the Wilderness in Sariska Tiger Reserve, Rajasthanⁱ

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'Tiger Crisis' and the Response

The local extinction of the Bengal tiger from Sariska Tiger Reserve, located in Rajasthan, in February 2005, made newspaper headlines more prominently than any other happening related to wildlife in post-independence India^{ii, iii}. Biologists, wildlife-lovers, social activists and the public were united in their shock and indignation. After all, the tiger is one of the few animal species that looms large in the Indian consciousness along with the rhinoceros, the lion and the elephant. It has been the prime flagship species for conservation in India since the 1970's when Project Tiger was initiated.

In the aftermath of this revelation, most commentators attributed the tiger's local extinction in Sariska to poaching (Wright 2005)^{iv, v}. However, biologists familiar with Sariska maintained that the tiger had been bound to disappear sooner or later, given the visible degradation of forests in the Reserve and the fact that the tiger population had reached an all-time low at the time (Johnsingh *et al* 1997)^{vi}. The failure of the Reserve in other ways was also obvious: the local people had, over the years, largely been alienated from the cause of tiger conservation. They had probably ignored or worse, abetted, in the poaching of the last-remaining cats. Thus for many conservationists, this event was just a dramatic manifestation of the overall failure of India's protected area network in protecting biodiversity rather than simply a law enforcement issue.

Sariska had always been a high-profile tiger habitat, frequented by ministers and bureaucrats, partly due to its proximity to both Delhi and Jaipur. Tourists from both big cities and small towns, came here in droves, often breaking the popular tourist circuit from Delhi to Jaipur, with the hope of spotting one of the big cats. Sariska had had considerable attention from biologists as well, being the grounds for many a doctoral thesis and a field training site for forest officers. Due to its prominence, Sariska had comparatively better infrastructure and management resources than many other Tiger Reserves. For instance, it boasted of one of the highest guard-to-forest area ratios in the country (Ministry of Environment & Forests 2005).

Interestingly, Sariska had been the site of a village-based initiative in forest and water conservation since the late-1980's led by the Tarun Bharat Sangh, an influential voluntary organization working in Rajasthan^{vii}. Many believed that a certain level of coexistence had been established between local communities and wildlife over the years through the efforts of the Tarun Bharat Sangh which was working mainly on water conservation issues. Water conservation being seen as the common goal that could unite people and wildlife in this semi-arid landscape, it supposedly had the support of the local residents. Apparently even these activities had failed to engender substantive local support for tiger conservation.

As the eventful year of 2005 wore on, the State Forest Department of Rajasthan, took steps to increase armed protection of the Reserve using paramilitary and police forces^{viii}. Since commercial poaching, was thought to be the primary cause behind the disappearance of the tiger, villagers suspected to be part of the tiger-poaching ring, were arrested (Gupta 2005). For the first time in its history, the Reserve was closed off to the public, including researchers, for a period of four months to enable investigations with the help of India's premier intelligence agency, the Central Bureau of Investigations.

Soon after, in July 2005, a three-year old dormant plan for village relocation was revived by the Reserve managers, proposing to move out all of the 27 villages located in Sariska. Coming close on the heels of the news of tiger disappearance, the obvious assumption was that the local residents were the primary cause of Sariska's manifest failure as a tiger reserve. The process of displacement would begin with the eleven villages located in the principal core area (Core Area I). Critiques by civil society that the relocation package, prepared three years earlier, was woefully inadequate, both in terms of financial allocations and micro-level planning, were ignored (Shahabuddin *et al* 2007). The relocation package had been found to be riddled with problems, not the least being the lack of financial allocation for irrigation and or of availability for livestock fodder and fuelwood in the new site (Shahabuddin, Kumar & Shrivastava 2007). However the Reserve managers indicated their eagerness to push ahead with this plan.

To further explore the causes for the 'tiger crisis', the Indian government set up an expert panel, the Tiger Task Force (TTF). In July 2005, after far-reaching consultations and hearings with more than three hundred biologists, social scientists, activists and forest officers across the country, the Task Force, headed by Sunita Narain of the Centre for Science and the Environment, suggested a far more rational

approach to resolve this crisis (Ministry of Environment & Forests 2005). It advocated planning carefully for habitat improvement in each Tiger Reserve, based on scientific studies of both habitats as well as ongoing extractive activities, including possibilities for controlled extraction of forest products. The TTF further called for a rational decision-making to determine which human settlements needed to be relocated on a priority basis and for enhancement of the compensation package in cases where relocation was unavoidable. It also suggested developing economic incentives for people living in the larger buffer zone around the Reserve that would give them a reason to protect wildlife. The TTF criticized the manner of decision-making on the issue of PA management that has historically been top-down with minimal reference to public opinion and often based on faulty science (Ministry of Environment & Forests 2005). The TTF additionally suggested far more involvement of biologists, including the growing number of independent scientists in India, to help design future management of Tiger Reserves.

The response to the TTF report was lukewarm. It was strongly criticized by Valmik Thapar, an influential wildlifer and writer, for not giving enough importance to tiger conservation needs and saw little possibility for co-existence between people and tigers. Thapar advocated comprehensive village displacement from reserves as a first step to consolidating tiger habitat (Thapar 2005). Ullas Karanth, a renowned tiger biologist, while appreciating the data-based, transparent approach of the TTF, opposed its suggestion of allowing multiple use or local involvement in reserve management (Karanth 2005). Other conservationists hailed the TTF report as representing a significant step forward in India's conservation history given its transparent mode of functioning, and emphasis on scientific rigor (Shahabuddin 2005).

Poaching, seen as the primary cause for the tiger extermination from Sariska and other Tiger Reserves, became a target for longer-term action as well. As suggested by the TTF, the Tiger and Other Endangered Species Crime Control Bureau was established, that would have special powers to investigate wildlife crime with immediacy. Further, the National Tiger Conservation Authority was set up in New Delhi, heavily delegating powers to the Union Ministry of Environment and Forests to make decisions on management issues relating to Tiger Reserves^{ix}. In November 2006, legal amendments to the Wildlife Protection Act of 1972 were passed in Parliament, giving more powers to local authorities to apprehend illegal poaching and forest use and considerably enhancing the punishment for

wildlife-related crime. In July 2007, fresh financial provisions were made to establish an elite Tiger Protection Force, comprising ex-servicemen that would be active around Tiger Reserves^x.

In November 2005, another important recommendation of the TTF was taken up for action: a mammoth proposal to re-census the tiger all over the country with the aim of establishing more accurate numbers. One of the failings in Reserve management had been thought to be the prevalent technique of counting individual tigers using primarily their pugmarks. The pugmark-based technique, had long been widely criticized as leading to over-reporting of tiger numbers in Sariska and other Tiger Reserves in the country which, in turn, was responsible for obscuring declining tiger numbers. During the proposed new census of tigers, the pugmark method was to be finally phased out. This time, the census was to take the form of a multi-stage, scientifically rigorous process that would take field researchers from the Wildlife Institute of India to every Tiger Reserve in the country. Tigers would be counted using statistically rigorous methods based on intensive camera-trapping that would then be backed up by assessments of habitat based on both remote sensing and field studies.

During 2005, a rather bold governmental decision had been publicly announced: to reintroduce tigers in Sariska as soon as was possible^{xi}. A feasibility study was therefore carried out in 2007 by the Wildlife Institute that recommended shifting of adult tigers from the Ranthambhore Tiger Reserve, located approximately 200 km away in a similar ecosystem. However, the reintroduction of tigers without the necessary improvements in Reserve management, particularly in terms of human resources, management infrastructure, forest restoration, or buffer zone management, appeared to be doomed to failure. The viable habitat for tigers in Sariska was 70 sq.km. at the most, because one had to discount the large areas degraded by forest over-exploitation or occupied by villages within the Core Area I. Such a small area, confined to the centrally located Sariska valley, was unlikely to maintain a significant tiger population for too long, although it did harbour high densities of ungulates. A single male tiger needs a minimum of 5-10 sq.km of prime habitat (with high prey density) to survive, a territory that encompasses those of two or three female tigers (Karanth and Nichols, 2002). Therefore the available habitat could support 7-14 tigers at the most, a population that was unlikely to be viable in the long term. This was a specially serious problem given the lack of connectivity of Sariska with other high quality forests in the region.

In the mean time, the Reserve managers pressed ahead with the relocation plan for the villages, inside the core area, a plan that was expected to pave the way for tiger reintroductions. Relocation began in

September 2007, with the small village of Bhagani, comprising of twenty households, being moved out to a denotified forest site 70 km away from the Reserve.

Thus, since the disappearance of the tiger from Sariska in 2005, the government had acted in uncharacteristic haste to implement a few of the many recommendations that the Tiger Task Force made in July 2005. However, the recommendations it chose to implement were mainly, related to the deployment of additional protection forces against poachers^{xii}, creation of a department specialising in wildlife crime and re-censusing of tigers all over the country. It also pressed ahead with the village displacement plans without the proposed improvement in the decision-making processes related to relocation, and the resettlement package. Neither were there any indications that the forest bureaucracy would concurrently undertake the other vital steps in the Reserve's periphery to improve Reserve management. The lack of initiation of any activities related to the improvement of park-people relations, or badly needed habitat restoration, were, in particular, gaping lacunae that seemed certain to stymie any future attempts at biological conservation.

Did the disappearance of the tiger from Sariska represent a watershed in the history of wildlife conservation in India? Or did the administrative response to big cat extinction simply symbolise a continuation of the traditional principles of wildlife conservation in India, as evidenced from before Independence? To critically examine these questions, it is necessary to make a foray into the history of management of the Reserve since the early twentieth century as well as that of its people^{xiii} and its wildlife.

Diversity at the Edge of the Desert

Nestled in the ancient Aravalli Hills, Sariska Tiger Reserve was an important area for conservation of the Bengal tiger in Rajasthan (Divyabhanusinh 1987). Sariska has the potential for sustaining a high density of tigers, being similar in habitat to the better-known Ranthambhore Tiger Reserve (Sankhala 1964, 1969). The Reserve harbours a high diversity of plants and animals that are all uniquely adapted to the extremes of temperature and drought conditions experienced in this part of north-western India^{xiv}.

The most widespread forest type in Sariska is dry deciduous^{xv}, dominated by trees of dhok (*Anogeissus pendula*), salar (*Boswellia serrata*) and *Lannea coromandelica* that cover the undulating hill slopes right up to the steep ridges. In the drier and flatter terrain, thorny scrub forest occurs, with trees of palash (*Butea*

monosperma), ber (*Ziziphus mauritiana*), raunj (*Acacia leucophloea*) and khair (*Acacia catechu*), interspersed with a variety of grasses. The scrubby plains are where the nilgai (*Boselaphus tragocamelus*) graze even in the mid-day heat while the sambar (*Cervus duvauceli*) and chital (*Axis axis*) gather at water holes and small reservoirs. But it is the tall riverside forest along the perennial streams that is most diverse, with trees of gular (*Ficus infectoria*), kadamb (*Mitragyna parvifolia*) and khajur (*Phoenix sylvestris*) in addition to dense stands of bamboo (*Dendrocalamus strictus*).

Carnivores such as leopard (*Panthera pardus*) and jungle cat (*Felis chaus*) are commonly seen in Sariska along with lesser-known mammals such as the ratel or honey-badger (*Melivora capensis*), and the ruddy mongoose (*Herpestes smithii*) (Mukherjee 2000). The four-horned antelope (*Tetracerus quadricornis*) was always rare in Sariska but may have become extinct during the last few years (AJT Johnsingh, *pers. comm.*). The rich mammalian diversity in this semi-arid Reserve, despite the low rainfall conditions and extreme temperatures, is at least partly attributable to the presence of several permanent springs (Rodgers 1990). Sariska is rich in bird species, too, rivalling many of the other Tiger Reserves in India. (Shahabuddin, Kumar & Verma 2006). Much of the avifauna is typical of the tropical dry forests of peninsular India, including species such as the painted spurfowl (*Galloperdix lunulata*) (Bombay Natural History Society, 2001). Sariska is particularly rich in raptors and its checklist includes the crested serpent-eagle (*Spilornis cheela*) and the brown fish owl (*Ketupa zeylonensis*) that are restricted to the forested stream tracts. The riverain forests in Sariska provide evergreen habitat and rich diversity of trees that provide for roosting cover, fruit and insects for birds almost throughout the year (Rodgers 1990).

Hunter's Paradise or Tiger Reserve?

Current-day Sariska Tiger Reserve and its surroundings comprised a game reserve for the Maharajah Jaisingh of Alwar since the early twentieth century. During this period, while there was closure of portions for grazing and wood-cutting, parts of the central valley were opened for commercial sales of forest produce in order to raise State revenues. The economic significance of the area during Alwar State is proven by the astronomical revenues collected by the princely state. According to one estimate, a total of more than Rs.5,500,000 was collected from the area during 1931, a revenue that had shot up from Rs.3,000,000 in 1929 due to imposition of grazing fees and land taxes (Mayaram 1997).

Records indicate that several of the villages existing today inside the Reserve were established for enhancement of revenue collection from forest products such as timber, charcoal and fodder grasses (Johari

2007). During this period, people also received renewable grazing passes for a fee depending upon the number of cattle they owned. Sariska was declared a Wildlife Sanctuary with an area of 492 sq.kms. on Sept 18, 1958. However, there was no process of settlement of rights of local residents which is required for the formal establishment of Reserved Forests or Wildlife Sanctuary. The villages and cattle-camps, which were scantily populated at the time, continued to remain inside even after sanctuary notification.

In the 1960's, measures were taken to shift out cattle camps, referred to as *guddas* by the Forest Department, between 1966-67 from Kalighati and Slopka, today part of the core area. Later, village relocation from the Reserve took a more organized form when the Department attempted to move two villages, Karnakawas and Kiraska, during 1976-77, attempts in which it was not completely successful. In 1979, Sariska was officially declared a Project Tiger Reserve with a total area of 866 sq.km. The years 1980-1982 proved to be the beginning of an era of rapidly tightening controls on forest use by local people. Intention to declare part of the Core Zone of Sariska Tiger Reserve as National Park was issued in 1982. Following this, in 1987, the Forest Department issued a statement declaring as illegal, all activities related to forest use and agriculture by locals. As a result, people were left with mainly informal rights of forest use.

Sariska today refers to the Tiger Reserve of 866 sq.kms. The core area of the Reserve itself is divided into 3 parts: Core Area I, II & III covering areas, respectively, of 400.14 sq.kms., 126.50 sq.kms. and 97.50 sq.kms which are not continuous with each other. Additionally the buffer area of the Reserve covers 241.86 sq.kms. (see Figure 1). While the declared buffer zone today has sixteen villages, the core area harboured eleven in 2005 (Figure 1). As of 2005, people in none of the core area villages except for some in Deori, Dabli and Raikamala have any formal land rights (*pattas*) inside the Reserve.

As far as informal rights of forest use are concerned, villagers are informally allowed to graze their livestock and collect forest produce within a certain arbitrary area (up to a radius of 1-2 km) around their villages. They are usually fined for grazing if their livestock stray beyond this informal boundary. Villagers believe that they have rights to collect timber for house construction and fuelwood for household use. However, there is confusion about the exact rights and privileges to be enjoyed by the locals even among the forest staff. Our interviews revealed that a committee had been set up for settlement of rights^{xvi} of all the villagers living inside the Reserve in 1977 with the subdivisional magistrate of Alwar as its chair. However, the rest of the steps necessary for completion of rights settlement were not undertaken.

The People and their Economy

Inside the core area^{xvii} of Sariska, the villages tend to be rather small, having between 15 to 100 households. All the villages in the core area are inhabited primarily by Gujjars (87%) who belong to the category of Other Backward Classes (OBC)^{xviii}, designated as such for their relative socio-economic backwardness. Gujjars are traditionally associated with pastoralism and dairying activities but have been settled here for at least a century. There are smaller numbers of Meenas (a Scheduled Tribe^{xix}) as well as Meos, Brahmins, Rajputs and Bairwa households in this area.

Since the declaration of Sariska as a Wildlife Sanctuary, all developmental activity such as building of permanent structures, including roads, wells and schools, had been halted under the Wildlife Protection Act. Villagers need to walk anywhere between 2 to 14 km to reach a bus-stop, that too over fairly rough terrain, from where they can get transport to local health centres, schools and markets. While villagers do have access to a few government- and NGO-run schools in the core area, many children do not attend school because of the difficult terrain or the sheer distances involved. Our surveys in 2005 (Shahabuddin *et al* 2007) revealed that the average literacy rate among the local people was a poor 32%. Only about 1% of the population above 6 years of age had completed matriculation studies. The backwardness of the villages is also reflected in the sex ratio in the study villages which was estimated at 735 females to 1000 males, far lower than the national average of 933.

The living conditions within the villages are rather poor. Many of the villagers do not have access to potable water for most of the year. People obtain water mainly from shallow wells, and sometimes even forest streams^{xx}, for household use. In terms of modern equipment, a small number of households possessed radios, cycles and motorcycles in 2005. A few affluent households, however, possessed jeeps that are used by the entire village to transport milk to local markets. Without exception, people are completely dependent on fuelwood for cooking, collected from the forest.

The Sariska villagers depend heavily on forests for grazing their livestock. Their main source of income is selling milk, *mawa* (derivative of milk) and *ghee*. In 2005, a little over 89% of our surveyed households reported milk- and *mawa*-selling as their primary occupation which contributed to about 72% of cash incomes. Agriculture and daily-wage labour were reported as secondary occupations, by 45% and 38% of households respectively, together contributing to about 14% of household cash income (Shahabuddin *et al* 2007). People in only a few villages had agricultural land within the boundaries of the core area, while a

small proportion of families (approximately 19%) own some land outside, with most having less than 5 *bighas*^{xxi} each.

People possess buffaloes, cows and goats, having small holdings of 10-20 animals per household. While goats comprised as much as 55% and buffaloes made up 40% of livestock holdings in the core zone, cows and sheep are rare^{xxii}. Buffaloes are the most prized livestock in the area, particularly for relatively more affluent households. Goat herds are commonly doubled or tripled in a year due to their hardiness and high rate of reproduction^{xxiii} and are commonly kept by the poorer households.

The economic status and degree of indebtedness of the majority of households entails a high dependence upon quantum of rain each year that, in turn, determines the quality and quantity of green fodder available. With normal rainfall during the monsoon, there is enough forest fodder available from July through October. Post-monsoon, people begin harvesting and storing forest fodder. From the beginning of the month of April when there is even less green vegetation left in the forest, stored fodder is fed to livestock right up to the beginning of the next rainy season in July. During summer, when both stored grass and forest fodder are at a premium, the villagers take their cattle out from the forest to feed them off agricultural crop residues bought from farmers of villages nearby. Other than farm fodder, the cost of feeding buffaloes involves purchase of *kankda* (seeds of the silk-cotton tree *Bombax ceiba*) and *khali* (oilcake residue from pressed mustard seeds) which is given to the milch buffaloes.

Milk from various villages in Sariska is sold at several dairies all of which are located within a distance of 20 km. Milk is sold at the rate of Rs. 12 per litre in the better-connected villages and transported by jeep from the villages which have fair-weather road access. The rate is much lower for the villages that are difficult to access and could go down to Rs. 8 per litre.

While livestock loss to leopards and tigers (up to 2004) were commonly reported inside the core area, there are indications that these losses are very much a part of the calculations in a Gujjar's grazing economy. Rough estimates during 2004-05 indicate that up to 33% of households reported livestock loss to large carnivores in the villages of the core area, although the proportion of livestock lost was reported to be low, near 1-2%. Goats were most commonly preyed upon, likely by leopards. Buffalo kills were relatively infrequent due to the rarity of tigers, which are the only carnivore large enough to prey on them. In no household did we encounter a single case of livestock loss being compensated even partially. Average

annual income of a household is Rs. 48175 for a family of 6 members. However a large share of this is spent on commercial cattle feed (about Rs. 18,000) (Shahabuddin et al 2007). Our surveys revealed that about 50% of household expenditure was calculated to be on food, 21% on commercial fodder, 11% on farm fodder and 16% on medical care. Thus the economy of the average household is quite precariously balanced, subject to complete devastation in the event of natural disasters such as drought. Supplies for livestock and household consumption are often bought on credit, paid back with the advent of the monsoon when milk sales typically go up.

Our interviews with local people revealed a high degree of discontent about livelihood opportunities. Many people believed that the area has suffered a steep decline in average rainfall^{xxiv} in last ten years that has resulted in severe declines in forest fodder availability. Many people believe that other employment opportunities that were available locally in the past have also declined. For instance, the employment offered by the Forest Department such as in road works and weed eradication is also limited^{xxv}. While there was a steep rise in tourism activities in the Reserve from 1990 to 2005, local villagers have benefited only marginally. The two local resorts do employ a few villagers but they work on daily wages or extremely low salaries and often are not paid for weeks together.

Discourses around Degradation

For several years now, ever since ecological research began in Sariska, biologists have been concerned about habitat degradation, particularly the impact of intensive biomass extraction such as firewood and fodder collection and livestock-grazing (Rodgers 1990; Johnsingh et al 1997). Severe lack of tree regeneration was noted in Sariska almost nineteen years ago (Rodgers 1990). At a larger scale, studies based on remote sensing by the Forest Survey of India (1993) indicated a mixed picture of habitat change in Sariska between 1983 and 1989 in which some open forests had 'improved' to dense forest. However, a considerable area of dense forests had also deteriorated to open forest during the same period .

By 2004, tigers had become quite uncommon according to both biologists' and villagers' accounts. According to biologists, no more than 10 adult tigers survived in the remnant habitat in Sariska in 1997. During 2004, at the end of which the reports of the tiger's extinction were brought to light, the number was likely to be much lower, possibly 7-8 and the viable habitat reduced to as little as 20% of the core area I of 400 sq.km. (*pers. obs.*). The buffer zone was next to useless for wildlife, being severely degraded.

During the time of our surveys, there was widespread recognition of adverse changes in habitat condition among local people as well. Our surveys revealed a widely prevalent perception of decline in quality and quantity of natural resources including grazing lands, forests and water. While 97% of people felt that the available area for grazing had significantly reduced during the last ten years, 85% felt the same for net forest area. 93% of our respondents felt that the time needed to collect biomass had significantly increased (**Figure 2**). Reports of decline in some key tree species like *guggal* (*Sterculia urens*) frequently came up in conversation.

While there was agreement across the board regarding the trends in biodiversity loss, its causes were far more debatable. The documents of the Forest Department reveal a strong conviction that biodiversity decline in Sariska is solely because of forest resource extraction by local villagers (Government of Rajasthan 2004; Johnsingh et al. 1997). My ecological research since 2003 corroborates such visual evidence that intensive biomass extraction has caused significant changes in forest vegetation structure and species composition (Kumar and Shahabuddin 2005). Canopy cover, density of trees, number of tree species per unit area and average height of trees were found to be significantly lower in intensively extracted sites in comparison to protected sites. There was also an observed shifting of tree height-classes and girth-classes towards lower values due to extraction. Thus, there were greater numbers of small trees and fewer large trees in intensively used areas in comparison to protected sites. Trees that are not preferred for fodder such as *Balanites aegyptiaca* and *Capparis sepiaria* had increased in density around the forests surrounding villages. A number of exotic invasive species had become common in the used areas of the Reserve such as the annual herb chakunda (*Cassia tora*) and the short-statured tree vilayati kinar (*Prosopis juliflora*). I also observed extremely low tree regeneration throughout the Reserve apart from parts of the riparian zone (Rodgers 1990). In a related study on the bird communities of Sariska during 2003 to 2005, we have found that intensive human use was beginning to affect avian diversity as well (Shahabuddin & Kumar 2006). Rare raptorial and insectivorous species and those restricted to scarce riparian habitat seem particularly threatened such as the crested serpent-eagle, brown fish owl, the grey tit, the painted spurfowl and the Tickell's blue flycatcher.

On the other hand, villagers blamed the forest personnel for their poor management and protection of the Reserve and alleged that much of the degradation was due to timber-cutting and grazing by outsiders. I too doubted that the extractive pressures came simply from local residents. It was common to see headloaders and fodder collectors coming in from towns and villages as far away as 14 km. Other observations also

indicate that forest protection is highly inadequate in the Reserve. In the 1990's, for instance, biologists report instances of armed poachers commonly killing tigers and sambar in the outskirts of the Reserve (S. Mukherjee *pers. comm.*). Guards also admitted to us that they were quite powerless to stop poaching since they are unequipped to deal with armed intruders. The motivation among guards to patrol the forests, stop poachers or other intruders is observedly low, which is understandable given their low pay-scales and lack of protection infrastructure and equipment, medical insurance or physical training. The Tiger Task Force in 2005, reported that over half of forest guards in Sariska were between 45 and 50 years of age and therefore unable to cope with the rigours of field patrolling. There had been no recent recruitments to field staff for 18 years due to a state-wide freeze. Nor is there any system of rotation to keep younger staff on field duties and relegate older guards to administrative positions. Conversations indicated that many of the guards have little knowledge of and interest in a forest with large carnivores. Many are not comfortable in the wild, having served only in a nearby wetland reserve or forest nurseries.

The emphasis on reducing local forest dependency has also historically obscured the fact that there are several other pressures originating from tourism the effects of which have not been studied at all, nor even considered in management planning (Government of Rajasthan 2004). Within the proposed National Park, there are two temples which are widely visited by religious and other tourists from outside Alwar, located in prime wildlife habitat around perennial springs in the Core Zone. Pressure from tourism is unmanageably high to say the least. The number of visitors in STR approximated 2,60,651 in 2003 and 2,93,649 in the year 2004, based on the number of tickets sold at the main gate and records of visitors on days when entry is free for religious reasons^{xxvi}. Even these figures are probably underestimates given that many people from surrounding areas enter on foot from unmonitored gates. Heavy tourist load can be visibly seen to disturb wildlife, create solid waste and pollute the critical perennial springs that provide water and cover for wildlife during the dry season.

Mining for marble, limestone and dolomite at the immediate periphery of the Reserve is another important damaging activity that has been a point of contention for at least twenty years, mainly due to legal interventions by TBS (see also Shrotiya, *undated*). Today, although work at some of the mines near Sariska has now come to a halt, several continue to on the southern periphery of the Reserve. Apart from noise and dust pollution, the hydrological regime of dry deciduous forests of Sariska are under grave threat from the pumping out of water from marble quarries. However, despite visible environmental impacts, the issue of commercial mining is largely overlooked in all official documents on management of Sariska.

Displacement in the Past

The emphasis at the management level on the supposed cause-and-link relationship between local people and ecological degradation has mainly dictated the policy of management in Sariska. This policy has focussed on village relocation as possibly the only tool to secure biodiversity, ever since the establishment of the Wildlife Sanctuary.

As mentioned earlier, there are several references to village relocation from Sariska starting in the early twentieth century during the rule of Maharajah Jai Singh (Johari 2003). In the 1970's, the villages of Karnakawas and Kiraska villages were relocated to two different sites: Sirawas (near Silisere, Alwar District) and Bandipul (near Ajabgarh, Alwar District). These displacements caused much unrest among the local population who alleged that the promises made to them regarding the new site were not fulfilled by the Forest Department. For instance, they were not provided basic amenities at the site such as electricity and road connectivity. Nor was the land fit for cultivation when they arrived there. From all accounts, force was used to evict them from Sariska and they were forced to accept whatever meagre compensation was provided.

Visits to one of the relocation sites Sirawas revealed the allotted land was fertile and even the water table was satisfactory. However, even today there is no road to the site from Silisere and one needs to walk for about 20-25 kilometers to reach the site. The other approach is by boat across the Silisere Lake which few villagers can afford to pay for. Nor are there any health or educational facilities or access to electricity.

The second site, Rundh Bandipul, is mainly occupied by original allottee families from Karnakawas. In this area, is also located a recently built seven-star hotel which has virtually blocked off access of the villagers to river water. When villagers were relocated here from Karnakawas in 1977, the Forest Department had not even cleared the growth of *vilayati kikar* trees that grew densely here. While the land is now reported to be fertile, and the water table was satisfactory, the agricultural lands were not marked clearly and distributed among the beneficiary households. As a result, most of the villagers still cultivate the lands according to the boundary markings done by them and therefore feel rather insecure. Further, the oustees here continue to face problems of intimation and coercion on questions of access to water, from the local Meenas. Thus the oustees from Karnakawas continue to have a harsh existence in terms of access to water, basic security and development infrastructure, even twenty-eight years after relocation. Several of the families had returned

to Sariska from this site and their descendants now live in Chhota Kundalka, which is located at the edge of the current Core Area I.

A New Era of Relocation Planning and Policy

As mentioned earlier, the relocation package prepared for the eleven villages in the core area, in 2002, was revived soon after the tiger crisis. A new site at Badhod Rundh, 75 km from Sariska in the adjoining district, was selected for rehabilitation of the oustees. According to the relocation package for Bhagani village of twenty households, the first to be targeted, a cash compensation of Rs.16, 000 and a 'disturbance allowance' of Rs. 7000 was allotted to each household of 5-6 members to tide over the transition period (Table 5). These allotments were rather meagre, considering that the local people would have been forced to change their primary occupation from livestock-grazing to cultivation. Construction of a house, a cattle-shed and fences around each homestead was allotted a sum of Rs.40-54,000 per family. Appraisal of the formal relocation package suggested that all the compensatory items were being adjusted into a sum of Rs.1,00,000 per household, including personal benefits and allotments for communal facilities whether such a sum was actually sufficient for a successful relocation or not.

In terms of land allotment, however, the proposed relocation was rather progressive in historical terms with each household receiving land titles of 2.1 hectares each even if they did not possess formal land titles inside the Reserve. On a visit to the site in January 2005, we found that the relocation site was located on the State Highway to Jaipur (about 8 km from its intersection with the National Highway), offering easy access to markets and other facilities. School and health facilities were present in Badhod, barely five kilometres away. The people in the adjacent village reported satisfactory crops of wheat, mustard, maize, gram and bajra. However, it turned out that to practise agriculture in this area, large investments would be required for the installation of borewell facilities because the water table had receded to a depth of 400 ft. However, in the resettlement plan, not even one borewell had been budgeted for the 2 villages (approximately 120 households) proposed to be moved here in the initial phase. Concerns of irrigation facilities and drinking water are specially serious in the low-rainfall zone in which Sariska is located, where surface water availability is limited to the short wet season from July to September. At the time, we envisioned that the lack of forests and pastures close to the relocation site could become another serious concern if agriculture turned out unsuccessful in the area and the oustees required fodder for sustaining their milk-based livelihoods. Cooking gas connections or alternative sources of fuel had not been considered at all in the relocation plan. The biggest lacuna in the official relocation plan, however, was the

lack of a provision for income compensation during the transition period during which the oustees were to carve out a new life for themselves (see also Sharma & Kabra 2007 and Mehra et al 2004 for similar experiences in other parts of India. In 2005, therefore, the plan for relocation of two villages from Sariska was riddled with innumerable problems that needed to be set right before people could be moved.

Two years later, in September 2007, the first set of twenty households had begun their move to the relocation site. When I visited the resettlement site just a few weeks after the relocation had begun, only seven houses had been completely constructed. As was expected, the financial allotment for house construction in the relocation site (Rs. 84,000) had turned out to be too low for the kind of housing expected by the villagers. As the cost of construction of each house had gone up to Rs. 110,000, the forest department reported that the initial financial allocation for land-tilling and transport of belongings from the Reserve had now been diverted to house construction. Road connections, agricultural land and electricity connections had been developed satisfactorily in the resettlement site, it seems in response to the demand of the local villagers. Land had been officially allocated to each of the households. A single deep borewell had finally been made facing much demand from the oustees. However, this catered only to the drinking water demands of the oustees leaving no provision for irrigation. A certain degree of optimism was, however, visible among the oustees who had been desperate to move out of the Reserve due to the particularly difficult living conditions in Bhagani, such as the lack of potable drinking water. Several families already possessed some agricultural land in other villages outside the Reserve which was tiding them over the first year after relocation. The villagers appeared far more confident about making a relatively smooth transition to a modern existence.

However, there are also indications of resistance to displacement in the other villages in Sariska if appropriate adjustments are not made in the compensation package and better implementation not ensured. After the relocation of Bhagani, a much larger village Kanakwari of about 190 households has been targeted for displacement. According to the ACF, approximately 120 households had given their consent to move while 70 households were still resisting the relocation. It is possible that many of the latter are likely to be those who do not possess any assets outside the Reserve and see the move as a highly insecure one, given the existing relocation package (*pers. comm.* Asmita Kabra). Further the financial allocation for resettlement of families from core areas of tiger reserves was dramatically increased by a factor of ten by the government (from Rs. 100,000 to Rs. 1,000,000) overnight to encourage people to move^{xxvii}, as had been suggested by the Tiger Task Force in 2005.

I witnessed the house-building activities of Kanakwari people. The Reserve managers indicated that they had taken the support of the State Agricultural Department for local capacity-building for agriculture and microfinancing. The village displacement process, while it had started with several problems, had been considerably improved upon over the preceding few years, perhaps in response to an increasingly active village representation. In late 2008, I saw that several men from Kanakwari had moved to the relocation site and had been given the funds for having their houses constructed. This was a major improvement over past relocations here and elsewhere, since the chances of corruption had been almost eliminated. The villagers seemed satisfied since the move to the relocation site represented for them a major step up the social ladder due to the land entitlement despite the fact that other issues of security, cooking fuel, irrigation water and crop-raiding continued to remain. Interviews indicated that they, however, viewed the latter issues as more secondary that could be dealt with at a later stage.

Reclaiming the Wilderness

In February 2008, the final report^{xxviii} on the national tiger population was publicly released by the Wildlife Institute of India, which confirmed dwindling tiger numbers in the country. The estimate of the number of tigers in the country had gone down to 1411 from the nearly 3600 counted in '2003', a period of just five years^{xxix}. Yet there were doubts as to the accuracy of the new census, given that several Tiger Reserves and known habitats outside of PAs could not be surveyed for logistical reasons. Despite international peer-review, (which took place much after the census was well underway), the census suffered from several shortcomings^{xxx} which considerably reduced its credibility. For instance, there had been little consistency of field methodology across the numerous Tiger Reserves with respect to assessing forest quality and herbivore abundance. Extrapolation of tiger densities from the small areas that were sampled was another source of error. The samples were usually located in a part of a Reserve that harboured the best tiger habitat in order to maximise chances of encounter.

The plan for relocation of tigers into Sariska was pushed by the Rajasthan State Forest Department, with the first pair of tigers being reintroduced in June 2008^{xxxi}. The relocation took place under heavy secrecy, with only a few conservationists and mediapersons allowed inside the Reserve during the period. An expenditure of Rs. 150,000,000 was reported to have been incurred which included transport of the tigers from Ranthambhore by an Indian Air Force helicopter and their radio-collaring. The Wildlife Institute, Rajasthan Forest Department and the Indian Air Force were involved in the tranquilization and transport of tigers which soon turned into a media event^{xxxii}. The tigers were fitted with state-of-the-art

satellite radio-collars, each worth Rs. 800,000, that are intended to intensively monitor the big cats, particularly to reduce risk of poaching^{xxxiii}.

As of December 2008, the two reintroduced tigers continue to be 'guarded' closely by forest personnel, their every move being reported each day by the Reserve managers. The media played along, reporting on every move and every kill of the animals^{xxxivxxxv}. In some cases, the reports became painfully ridiculous, such as a report on the male tiger being shooed away from a village it had strayed to at the southern edge of the Reserve. This incident underlined the fact that the almost complete lack of a buffer zone is likely contribute to enhanced human-wildlife conflicts, with little management skills for amelioration available in the Reserve management. Reports of livestock kills have already begun to trickle in. After the successful relocation of the two tigers to Sariska, the National Tiger Conservation Authority said that it planned to reintroduce three more tigers to Sariska over the following three years^{xxxvi}. A senior forest officer was quoted as saying upon the successful transport of the first tiger to Sariska forest:

'It is a historic moment. The country has done it while others have failed. This kind of wild-to-wild relocation has not taken place anywhere else'^{xxxvii}.

He continued on to say that Sariska Tiger Reserve could 'hold up to 50 tigers', ignoring the fact that a large part of the Reserve was depleted of both forests and prey. As late as February 2009, the Ministry of Environment and Forests continued to ignore severe habitat loss inside the Reserve, stating in a press release:

'The reasons for the decline in population of tigers are:

1. Mortality of wild animals due to poaching
2. Degradation of forest status outside Protected Areas/Tiger Reserves owing to human pressure, livestock pressure and ecologically unsustainable land uses....^{xxxviii}

The Sariska tiger relocations had become a way of regaining prestige for the forest department rather than a way to restore declining tiger populations in Rajasthan.

A field visit to Sariska in December 2008 revealed that apart from the reappearance of the big cat, not much has changed in Sariska Tiger Reserve in terms of governance or forest condition, almost four years after the extinction crisis of 2005. Forest habitat continues to degrade further, particularly in the buffer zone. Buffer zone management is still restricted to policing, without any steps having been initiated for improving park-people relationships in the periphery or local revenue-sharing with local villages. Crop damage by peacocks, nilgais, and wild boar had only intensified over time without any accompanying improvement in crop protection or compensation measures taken up by the Forest Department. There is no reason to believe that the threat of poaching had receded, given the palpable hostility towards the forest department, among most of the people living in and around the Reserve. Importantly, People continue to be highly dependent on the forest resources inside the Reserve for fodder and fuelwood. Further, complete relocation of the rest of the core area villages is obviously years away, given the difficulties in successful resettlement of the first village and the resistance in the next. Yet, the Reserve managers saw it fit to reintroduce tigers to Sariska at an enormous cost without first securing, restoring and expanding the available habitat.

Nor has much headway been made in improving the capacity of the forest staff for apprehending poaching and timber theft inside the Reserve. While additional forces of retired army men have been placed at key entry points into the Sariska valley ^{xxxix} little has been done to improve the lot of the permanent employees, the beleaguered forest guards. Interviews in 2008 indicated that there had been no improvement in salaries, field allowances or medical benefits to forest guards even four years after the recommendations made by the Tiger task Force. However, night- patrolling was far more strictly enforced than in the past with the result that many guards were now doing double the amount of work that they had been doing in the past for the same benefits. The poor service conditions made it obvious why 30% of guard posts remained unfilled nearly four years after the tiger crisis.

Problems related to the fragmentation of the Reserve by roads and highways continue. For instance, numerous road-kills of carnivores have been recorded from the portion of the State Highway No. 13 that runs through the core area ^{xl} for several years. An alternative tarred road circumventing the core area, about 14 km longer than the original route, was even constructed at enormous cost a few years ago. However, faced by strong opposition from the shops and business establishments in this area, (that would stand to lose business in the event of a road closure) the Reserve managers have failed to implement the court decision on the closure of this state highway ^{xli}. Lesser still has been achieved in

regulating the burgeoning pilgrim and tourist traffic into the Reserve^{xlii}, with senior forest officers stating their helplessness in the face of religious sentiments. A departmental decision to terminate free visits to the pilgrimage sites in the core area on Tuesdays and Saturdays has yet to be implemented^{xliii}.

The current conservation crisis in Sariska exemplifies the unconditionally anti-people and unscientific approach of the Forest Department. In analysing the causes for tiger disappearance, the historical legacy of commercial forest use, external biotic pressures, tourism and mining on local ecology or tiger numbers have been continually ignored. From the start, the relocation of villages was made a priority in PA management. This implied that that local forest use and locally abetted tiger poaching were the *sole* obstacles in effective conservation. The need for initiatives for improving buffer zone management, providing legal avenues for benefit to the surrounding villages or design alternatives to fuelwood, has, as a result, been completely overshadowed by the bureaucratic obsession for creating 'inviolable space'. The tiger has been reintroduced in a bid, as it were, to 'reclaim the wilderness', however reduced and fragmented that wilderness might currently be. The fact that the original threats to the big cat still remain, has been purposely overlooked, perhaps in a hasty bid to save the Tiger Reserve itself from denotification.

Conclusion

In this paper, I have examined in detail the governmental response to decline of the Bengal tiger in Sariska Tiger Reserve, and more recently, the attempted 'reinstatement' of this Indian tiger reserve. I have assessed the response from the points of view of environmental justice, quality of governance and scientific value. The exploration of this issue indicates that the national response to tiger decline in India simply represents a continuation of the exclusionary conservation policies adopted since the advent of Project Tiger, that ignore issues of public participation and local stakes in wildlife and that emphasize village displacement as one of the most important requirements enabling success of protected areas. Further, tiger conservation, as exemplified in Sariska, represents a lack of good science and poor management capacity in the forest establishment. These are important forces underlying the continuing biodiversity loss in the country that remain unacknowledged to this day.

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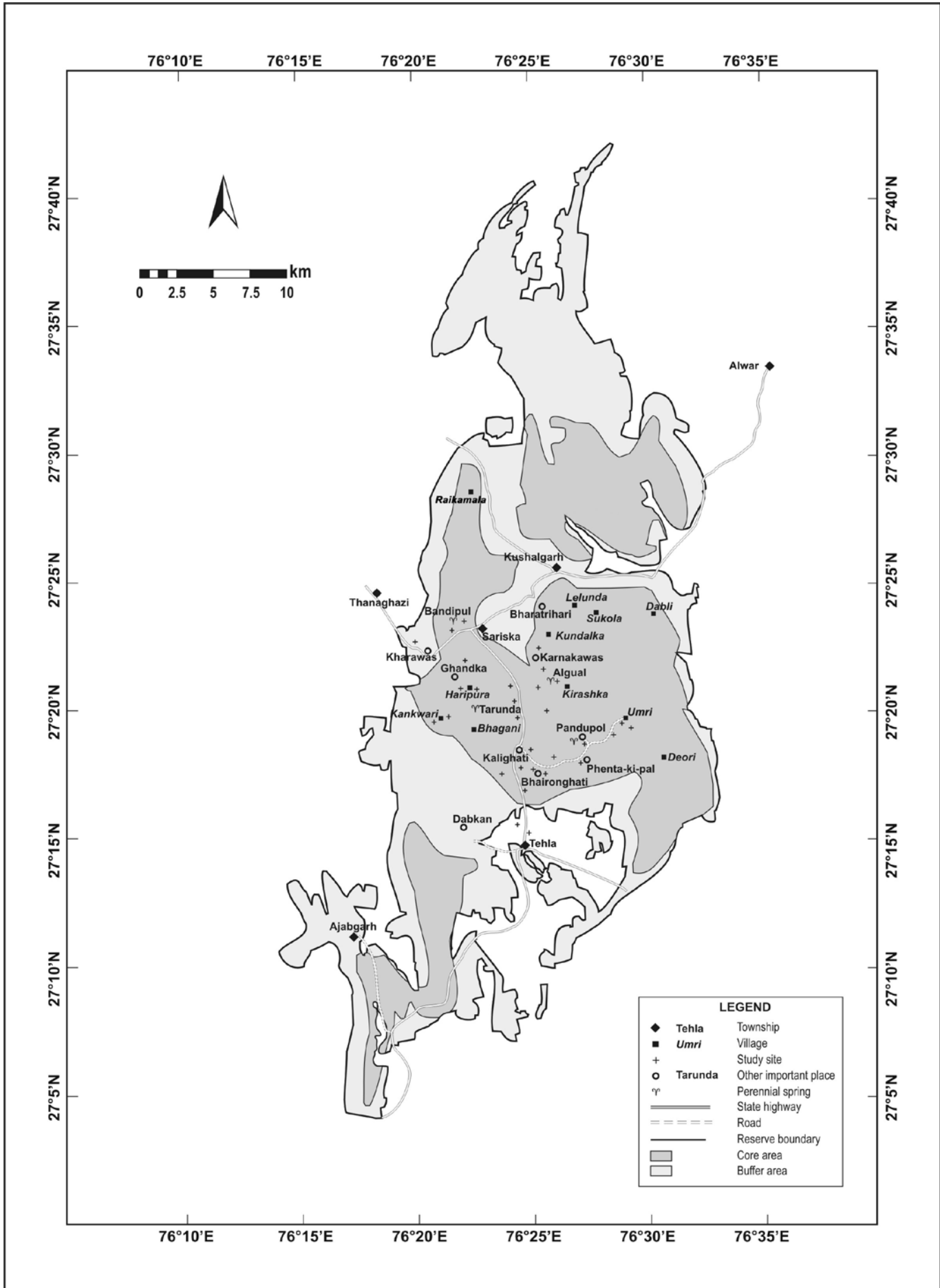
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TABLES & FIGURES

Table 1: Relocation package for Bhagani village (19 HH) of Sariska Tiger Reserve & State Guidelines for Relocation

A. Bhagani Village	
Individual HH Land Compensation	
Agricultural land per household	1.6 ha
Land for house construction	0.5 ha
Individual HH Cash Compensation	
House construction	Rs. 40,000 or 54,000
Cash compensation	Rs. 16,000
Disturbance allowance	Rs. 7,000
Land development	Rs. 8,000
Transport of belongings to new site	Rs. 3,000
Miscellaneous	Rs. 1,800
Extra for well, if already present on the land (only 1 in Bhagani)	Rs. 50,000
Community Works (on per-village basis)	
Approach Road	Rs. 1,50,000
Electricity	Rs. 1,50,000
Other	Rs. 4,000
Total planned compensation package for Bhagani	Rs.18,38,200
Required package (@ Rs. 1 lakh per family)	Rs. 19,00,000
B. State Guidelines	
(a) Individual compensation	
House Compensation	Rs.51000 for average construction area-85sq.m
Crop compensation (To be given to compensate for lost crop and/or less production in the first year at new site)	Rs.6000
Private well	Rs.5000
Tree Compensation	Rs.200
Disturbance Allowance	Rs.7000
Transportation Allowance	Rs.3000
Land Development	Rs.10000
Miscellaneous	Rs.1800
Total (a)	Rs.84000
(b) Community Works	
Approach Road	Rs.2000
Drinking Water	Rs.1500
Cattle Pond	Rs.1000
Community Hall	Rs.2000
Dispensary	Rs.4000
School	Rs.4000
Electricity	Rs.1500
Total (b)	Rs.16000
Total (a) & (b)	Rs.1,00,000

Figure 1: Map of Sariska Tiger Reserve



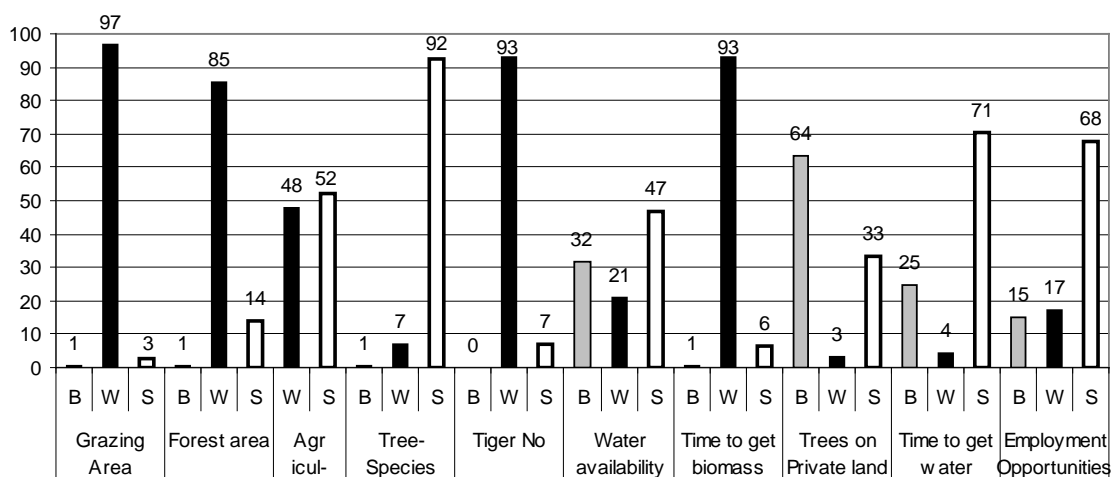


Figure 2: Perceptions of local people on changes in living conditions and natural resources inside Sariska Tiger Reserve (B: better; W: worse, S: same)

ⁱ This paper is modified from the first chapter of a book in press 'Conservation Crossroads: Ecology and Equity in a Divided land' to be published by Permanent Black in 2009.

ⁱⁱ Indian Express, February 15, 2005, p. 1; 'No Evidence of Tigers in Sariska-WWF-India'.

ⁱⁱⁱ Times of India, January 30, 2005, 'Big Cat vanishes from Sariska; Will Ranthambore be next?'.

^{iv} Indian Express, February 7, 2005, p.2; 'Deathtraps in place, Ranthambhore gets Sariska feeling'.

^v Hindustan Times, February 9, 2005; 'Sariska flouted norms'.

^{vi} However, the official figure, based on the officially conducted annual tiger census, had fluctuated between 16 and 25 animals from 1991 to 2004. In 2004, the last season when tigers were spotted in Sariska, the official figure was 16-18.

^{vii} The Hindu, New Delhi, 12 September 2000, p. 5; 'A Role for Villagers in Managing Sariska'.

^{viii} Indian Express (online edition), New Delhi, May 18, 2005; 'Roar like a Tiger, Mr. Prime Minister'.

^{ix} Times of India (online edition), March 22, 2008; 'Tiger Protection: Centre threatens to block state funds'.

^x Times of India, New Delhi, July 23, 2007, p. 9; 'Exclusive space for tigers soon'.

^{xi} Indian Express (online edition), September 8, 2005; 'Rajasthan panel wants tigers relocated'.

^{xii} Times of India, New Delhi, March 2, 2008 (online edition); 'India to spend \$13.15 mn to protect tigers'.

^{xiii} Johri, 2007

^{xiv} See for instance studies and notes by Reddy 1994, Sankar & Johnsingh 2002, Sankar 1994, Sankar et al 1993, Sharma 1981, Sharma 1986 and Sharma 2001.

^{xv} A type of forest located in a region where there is less than 2000 mm of rainfall annually. Most trees shed their leaves synchronously so that the forest appears leafless at a particular time of the year.

^{xvi} Settlement of rights involves an administrative process that includes an initial declaration of change in status from Reserved Forest to Wildlife Sanctuary, its local proclamation, determination of existing rights to forest use in the specified area through an inquiry, their approval and finally, acquisition of land rights or other rights through compensatory mechanism.

^{xvii} While there are twenty-seven villages in all within the Sariska Tiger Reserve, our research was restricted to the eleven villages inside the core area, due to limited time and financial resources. However, these are the villages that have experienced most conflict with the reserve managers historically due to the fact that the best wildlife was to be found here.

^{xviii} Other Backward Classes are a group of castes (as defined in Hindu society) that have been historically disadvantaged and therefore found deserving of affirmative action through reservations and protective legislation

to ensure equality. However, they are ranked above Scheduled Tribes and Scheduled Castes in terms of their social advancement.

^{xix} See previous endnote

^{xx} It was interesting that in 2005, we found that the villagers of Bhagani were collecting dirty streamwater for domestic use while a nearby temple, also within the core area had been allowed to construct a deep well for use by the incumbent *sadhu*.

^{xxi} A *bigha* is the commonly used measure of land which is roughly equal to one-fourth of a hectare or a square piece of land 165 ft. on the side

^{xxii} Earlier there were significant holdings of cows but were considerably decimated during droughts from 2001-2003.

^{xxiii} Normal price at which goats are sold is about Rs. 400 to 600. There are certain varieties that are priced as high as Rs. 6000.

^{xxiv} This is also borne out by the rainfall records kept by the Office of Deputy Director of Agriculture (Extension), Alwar

^{xxv} The general complaint of the people was that the works are contracted out mainly to the people who are Forest Department employees.

^{xxvi} Forest department records

^{xxvii} Indian Express (online edition), January 31, 2008; 'Rs. 600 cr. for tiger protection'.

^{xxviii} National Tiger Conservation Authority and Wildlife Institute of India (2008).

^{xxix} Times of India (online edition), February 13, 2008; 'Just 1411 tigers in India'.

^{xxx} Maraj & Seidensticker 2006

^{xxxi} Times of India (online edition), New Delhi, June 29, 2008; 'After 4 years, Sariska gets a tiger'.

^{xxxii} Times of India (online edition), New Delhi, June 24, 2008; 'Selection of tigers for Sariska begins'.

^{xxxiii} Times of India (online edition), New Delhi, June 23, 2008; 'Satellite to keep eye on tiger cubs'.

^{xxxiv} Times of India, (online edition), New Delhi, June 30, 2008; 'Tiger adapts to Sariska, makes first kill'.

^{xxxv} Hindustan Times, August 8, 2008; 'Sariska tiger couple at home, getting closer'.

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^{xxxvii} Times of India (online edition), New Delhi, June 29, 2008, 'History made at Sariska'.

^{xxxviii} Ministry of Environment and Forests Press release February 26, 2009

(<http://pib.nic.in/release/release.asp?relid=48037>)

^{xxxix} Times of India (online edition), New Delhi, June 27, 2008, 'Centre puts tiger reserves on alert'.

^{xl} Times of India (online edition), May 5, 2008; 'Highway traffic threatens animals in Sariska'.

^{xli} Times of India (online edition), June 26, 2008; 'Sariska villagers protest blocking of highway'.

^{xlii} But check current position in Sariska: Times of India (online edition), February 13, 2008; 'Sariska to ban private vehicles'.

^{xliii} Times of India, February 13, 2008, 'Sariska to ban private vehicles'.