

Habitat Fragmentation Due to Encroachment (Road Construction) and its Impact on Biodiversity of Sariska

Anil Kumar Dular

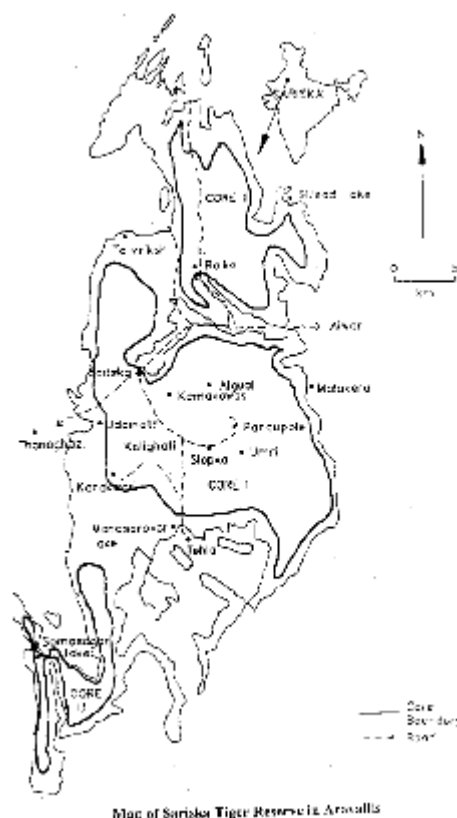
Department of Environmental Science, Maharaja Ganga Singh University, N.H 15, Jaisalmer Road, Bikaner, Rajasthan 334004.India

Abstract: *The Sariska tiger reserve in Aravallis has its own importance and specific characteristics endowed with unique biodiversity. In the present study an attempt has been made to ascertain status of plant and animal species which is the healthy indicator for forest ecosystem. Attention is focused on one of the important reserve forest of state of Rajasthan with pace of their endemism and facing number of challenges in this reserve. Out of them the serious and cause concern is the encroachment due to road construction (kuccha and pucca) is a serious problem and threat to biodiversity of the reserve area which is elaborated by several studies on various protected areas of India and World like, Agarwal ,2000. Andren,1994, Andrew,1990, Beier,and Noss,1998,Bennett,1991, Brody,and Pelton1989,Forman,and Alexander,1998. The menace of habitat loss or fragmentation due to construction of road is one of cause concern and severe impact on the pristine biodiversity.*

Keywords: Biodiversity, Sariska tiger reserve, Aravallis, habitat fragmentation, encroachment.

1. Introduction

According to the Champion and Seth (1968) the forest of Aravalli region falls under the broad category of Tropical Dry forests. Study area the "Sariska Tiger reserve" ($74^{\circ}14'$ to $76^{\circ}34'$ N and $25^{\circ}5'$ to $27^{\circ}3'$ E) is situated in the Aravalli hill range and lies in the semi-arid part of Rajasthan (Rodgers and Panwar, 1988). It became a wild life sanctuary in 1955 and Tiger reserve in 1982. According to Department of Forest, Government of Rajasthan the total area of the Sariska Tiger Reserve is 866 sq.km, of which 302.2 sq. km. is buffer zone and 497.8 sq.km is core zone. Sariska core zone is comprised of three isolated; pockets: Core-I (273.8 sq.km), II (126.5 sq.km.) and III (97.5 sq.km). The status of the Core I has been notified as a National park in 1982. Sariska is undulating to hilly and has numerous narrow valleys. Kiraska and Kankwari plateau and two large lakes Mansarovar and Somsagar. Silisad lake is situated just along the north eastern boundary of the reserve. The altitude of Sariska varies from 540 to 777 meters. The vegetation of Sariska correspond to Northern tropical dry deciduous forests (sub group 5 B; 5/E I and 5/E2) and Northern tropical thorn forest (Sub Group 6 B) (Champion and Seth,1968). The forest being scattered and sparse over a large area on various geological and soil formation and vary greatly in composition. Sariska is very rich in biodiversity with wide spectrum of flora and ample of wild life. The main economically valuable species are dhok (*Anogeissus pendula*) salar (*Boswellia serrata*), khair (*Acacia catechu*), bamboos (*Dendrocalamus strictus*), dhak (*Butea monosperma*), kair (*Capparis decidua*), ber (*Zizyphus mauritiana*) with having lot of ground flora comprised of shrubs, herbs, grasses and sedges etc.



2. Material and Methods

Personal observations were taken in the field by visiting the study area and its different landforms including core and buffer zone of the forest. It was a great help that the field staff of Sariska Tiger Reserve, Department of Forest, Government of Rajasthan was associated always in the field. Interview has been taken for counter check of their utility by local dwellers inside or outside the reserve. The density of roads according to human habitation are checked and their feasibility inside and outside the reserve were observed on

the toposheet 54/A with help of line and vehicle transects. The densities of vehicles are also counted in all ranges of reserve area.

3. Result and Discussion

In principle and according to forest rules and regulation there should be restricted movement and interference in the forests, because the vehicles make noise and sometimes trample wildlife. In the study area it is observed that different, weather bound metallic roads pass through the reserve which causes isolation and fragmentation of habitat leads to the loss of habitat in some vicinity of the reserve. From two wheeler to large sized buses, trucks plying on these roads which increase the chances of accident or mortality of wildlife. Monkeys, deers, peacocks, snakes, rabbits are very often get killed due to trampling of large vehicles A state highway dissects Sariska Tiger Reserve into two parts as it passes through Thanagazi- Alwar is very near to National capital territory. As high as 1500 heavy vehicles

pass through the state highways per day which is highest density in all the ranges of sariska reserve so far. Mortality of wildlife can be seen very often on state highway because animals are moving freely and migration in Sariska Tiger Reserve as the state highway passes through Sariska Tiger Reserve. The reserve is divided into four ranges and seventy five beats. The approach roads towards these administrative units having human habitation as forest villages, gwadas, madiculous places are relies on kuccha and pacca roads which intersects reserve into small fragmented units. The units have low and sparse density of flora and fauna along the road side, entrenched within deep of the forest. It is observed that sariska range having eighty five km of the length which is highest ever and proximity near prime tiger habitat core area 1st and adjoining buffer zone, thirty eight kilmeter in Tehla range, while sixty eight kilometer and twenty five kilometer are in Akabarpur and Talvriksh range respectively. Besides these roads, so many pavements kuccha road structure near water holes and visiting or gwadas sites have been seen so far.

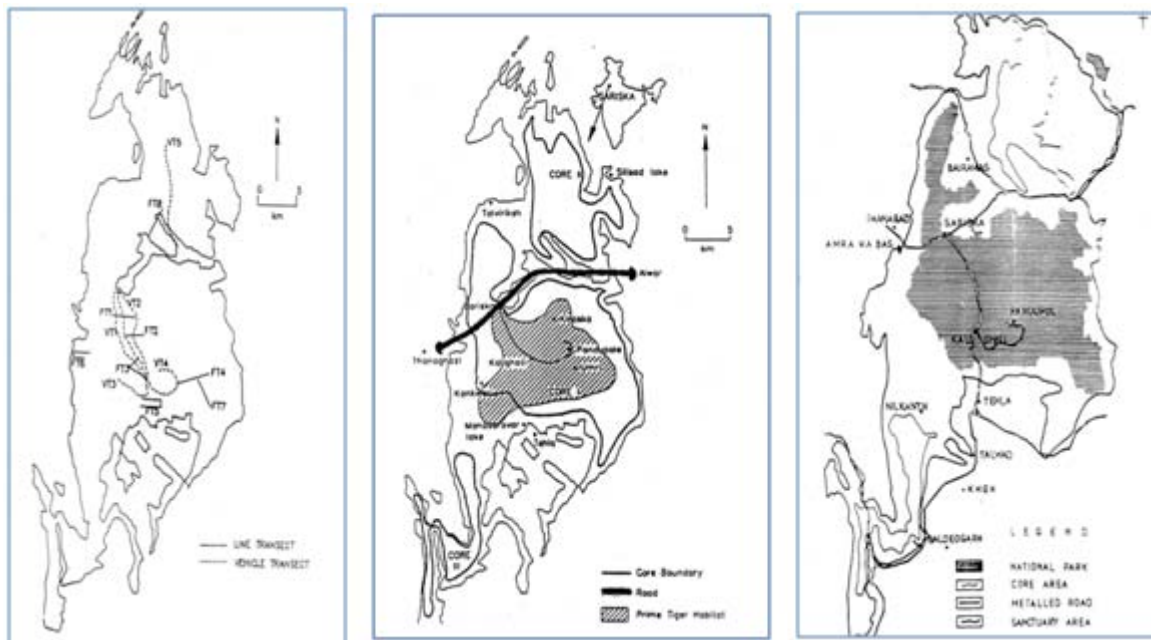


Table (a) The activities like encroachment through the road construction in Sariska

	From	To	Length in Km.	Range
1.	Sariska gate	Udainath	9 km	S A R I S K A
2.	Udainath	Raipura	3 km	
3.	Kala kua	Talgate	4 km	
4.	Bandipul	Bandipul Audi	1 km	
5.	Gankha	Tarunda	3 km	
6.	Tarunda	Brahmnath	5 km	
7.	Sariska gate	Tarunda	6 km	
8.	Brahmnath	Kalighati	3 km	
9.	Kalighati	Mala joharka	16 km	
10.	Sariska gate	Kalighati	12 km	
11.	Tarunda	Kiraska kund	8 km	
12.	Kiraska	Pandupole	6 km	
13.	Jelabi chowk	Brahmnath	4 km	
14.	Daruaka johra	Bhansota	1 km	
15.	Kalighati kua	Bauraka	4 km	

	From	To	Length in Km.	Range
1.	Mala joharka	Mandalvas	8 km	T E H L A
2.	Tehla rada	Bhagani	5 km	
3.	Nandu rada	Deori	6 km	
4.	Deori road	Kaimala	3 km	
5.	Deori	Jahaj	5 km	
6.	Damaka	Jahaj	11 km	

	From	To	Length in Km.	Range
1.	Umri	Naharsati	9 km	A K B A R P U R
2.	Naharsati	Rotkyla	8 km	
3.	Rotkyla	Boh jungle	4 km	
4.	Rotkyla	Dabli	11 km	
5.	Madhogarh	Raika	11 km	
6.	Beenak	Leel ka ghati	8 km	
7.	Raika	Kalikhhol	7 km	
8.	Kalikhhol	Beenak	4 km	
9.	Bara	Prithivpura	6 km	

From	To	Length	Range
------	----	--------	-------

Leel Kaghati	Nathusar	5 km	T A L V R I K S H
Nathusar	Rampura	8 km	
Todali	Gudha	6 km	
Raika	Nathusar	5 km	
Talvriksh	Chota bharthari	1 km	

4. Conclusion

In this study emphasis was laid the encroachment due to road construction in reserve inside and outside the Sariska Tiger Reserve. The study revealed that the loss of biodiversity of the study area due to anthropogenic activities like roads leads in habitat fragmentation and loss, which have impact on flora and fauna. The transportation on these roads leads to dissociate the reserve area into patches and simultaneously the migration of fauna is restricted, which reflects in their biological clocks and feeding or breeding behavior. Due to the human interference in reserve will lead to deterioration the quality of air and noise pollution which culminate the behavioral condition of the wildlife in the reserve. So to regain the sacred and pristineness of the reserve no interference at any cost shall be advocated for that rehabilitation programmes are on the way.

5. Acknowledgement

Author has deep sense of gratitude to his supervisor Director Indira Gandhi centre for Human Ecology and Population studies, University of Rajasthan, Jaipur for their able guidance during the research tenure and also thankful to Dept of forest, Government of Rajasthan and field director to Sariska and other staff members.

References

- [1] Agarwal, A., 2000. Adaptive management in transboundary protected areas: The Bialowiez National park and Biosphere Reserve as a case study. *Environmental conservation* 27(4): 326-333.
- [2] Andren, H., 1994. Effects of habitat fragmentation on birds and mammals in landscape with different proportions of suitable habitat : A review. *Oikos* 71: 355-366.
- [3] Andrew, A., 1990. Fragmentation of habitat by roads and utility of corridor : Review : *Aust. Zool.* 26 : 130-141.
- [4] Beier, P. and Noss, R.F., 1998. Do habitat corridors provide connectivity ? *Conservation Biology*, 12 : 1241-1252.
- [5] Bennett, A.F., 1991. Roads, roadsides and wildlife conservation : A review. In 'Nature Conservation 2 : "The Role of corridors"'. (Eds. D.A. Saunders and R.J. Hobbs), pp. 99-118. (Surrey Beatty : Sydney)
- [6] Brody, A.J. and Pelton, M.R. (1989). Effects of roads on black bear movements in Western North Carolina. *Wildlife Society Bulletin* 17 : 5-10.
- [7] Forman, R.T.T. and Alexander, L.E., 1998. Roads and their major ecological effects. *Annual Review of Ecology and Systematics* 29 : 207-231.

- [8] H.G. and Seth, S.K., 1968. A revised survey of the forest type of India. Government of India Press, Delhi, pp. 404.
- [9] Rodgers, W.A. and Panwar, H.S., 1988. Planning a wildlife protected area network in India Vol. I & II Wildlife Institute of Dehradun.
- [10] Rodgers, W.A., 1990. A preliminary ecological survey of Algal spring, Sariska Tiger Reserve, Rajasthan. *Journal Bombay Natural. History Soc.* 87(2) : 201-210.
- [11] Rodgers, W.A., 1991. A preliminary ecological survey of Algal spring, Sariska Tiger Reserve Rajasthan. *J. Bombay Nat. Hist. Soc.* 7 : 201-209.
- [12] Rodgers, W.A., 1991. The Management of protected area buffer zones for the maintenance of biodiversity. *Int. J. Sustainable Development*