

ANALYSIS OF THREATS TO GIR ECOSYSTEM

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Introduction

The insatiable greed coupled with myopic view of human nature slowly but surely destroys our valuable natural resources. The depletion of our forests at mind boggling rates on sustained basis has become a global concern. However, the process has never slowed down and in the recent time, despite best efforts by the foresters and the environmentalists, it has attained dangerous proportions. The major threat to the forest revolves around human beings. Nature has enough consideration for all but man, unfortunately, has different ideas and ideals. The threats, dangers to the forest, therefore, are many and final outcome seems to be very bleak.

Gir is not an exception. All the efforts made to conserve the valuable flora and fauna has not yielded desired results. In the crusade of saving the last abode of "Asiatic Lion" still the human beings vested interest have an upper hand. The anthropogenic threats always lurking dangerously upon the forests sometimes creating alarming situations and almost defeat the foresters in their crusade. The whole ecosystem is passing through a very critical phase and the main threats to which Gir is vulnerable are as follows.

(a) Grazing of Livestock

Gir with its 54 Maldhari nesses

supports 10,000 livestock within the forest area. These livestock graze in the sanctuary area by paying nominal grazing fee. Another 4,500 livestock owned by inhabitants of forest settlements also graze in the settlement beats of sanctuary area categorised as "other then cultivation". There are 97 vilages on the periphery of Gir forest. The main occupations of the inhabitants of these villages are agriculture and cattle rearing. The livestock population ever increases during monsoon due to influx of cattle from outside. The livestock from peripheral villages grazes in sanctuary area mainly during monsoon, despite strict enforcement of rules in the entire fringe area of the forest which is an immensely difficult task. As the grazing was freely allowed before declaration of the area as sanctuary, it makes the task much more difficult to handle. The vast and luxuriant forest of the past could withstand the grazing pressure as number of livestock was limited. However, presently when the livestock population has increased manifold and area of forest has reduced, this grazing pressure may prove suicidal for Gir. Also added to this the problem of large influx of cattle in Gir from other parts of Saurashtra during scarcity period. The grazing by livestock not only deprives the wild herbivores of their valuable food but also causes soil erosion and degradation of habitat. The excessive grazing in the sanctuary also leads to retrogression of the ecosystem, resulting into replacement of palatable grasses with

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unwanted unpalatable grasses and hardy weeds like *Cassia tora* and *Lantana camara* etc.

These excessively grazed areas are rendered unproductive for the wildlife, especially regeneration succumbs casualty due to excessive grazing. The influx of cattle from outside may create another hazard in the form of contagious disease to wild herbivores. Therefore the effects of grazing are quite serious and damaging to the ecosystem as a whole.

The reported cases (so many remain unreported) of illegal grazing inside the sanctuary have been increasing at a faster rate as revealed by the Table 1.

Table 1
Number of offense cases of grazing in Gir

Year	Number of offense cases of grazing in Gir.		
	Gir (West)	Gir (East)	Total
1989-90	84	20	104
1990-91	139	48	187
1991-92	115	58	173
1992-93	166	41	207
1993-94	122	66	188
1994-95	149	103	252
1995-96	79	69	148

Vulnerability analysis reveals that out of 152 beats, 61 beats are the most vulnerable to heavy grazing pressure during monsoon period.

(b) **Encroachment**

Due to its geo-environmental setting, Gir exists as an oasis engulfed by cultivation all around. There is a major threat to the forest from expanding agricultural activities

because this factor alone has the potential to catch up the forest from all around in a slow but gradual manner. Major portion of the sanctuary area has been fortified with the demarcation on all its boundaries. However, large area of the protected forest still remains to be demarcated and the vastness of the forest and inaccessible terrain at some places, aided with the negligence of staff makes it very difficult to curb encroachment. The boundary cairns and rubble wall fencing are the structure of loose stones which are very easy to alter. The black cotton soil around Gir is highly fertile in which several cash crops including much valued "Kesar" variety of mango is grown. Therefore, encroachment upon the forest land is a very lucrative proposition that is not easy to combat with. Some areas with thick forest cover have been notified as protected forest as late as in 1976 and larger part of this area still remains to be demarcated, rendering the area vulnerable to encroachment. There are a number of litigations still pending regarding the ownership of the area.

(c) **Illegal Removal of Forest Produce** (mainly firewood, timber and grasses).

There are 97 villages within a radius of 5 km abutting Gir protected area. There is sufficient demand of firewood and timber in these villages and the proximity of these villages to the forest makes the forest highly vulnerable to the illicit cutting. However the protection measures like, providing wireless network, arms and ammunition to the staff aided with the development of small scale industries as diamond cutting has effectively solved this problem to some extent. Yet the threat from the illicit cutting should not be taken lightly. The forest offences recorded during the period from 1985-86 to 1994-95 and the quantity of

timber and fuelwood as against these offences in Gir is shown in Table 2.

Table 2

Number of offences and timber/fuelwood involved

Year	No. of offences	Timber involved (m ³)	Fuelwood (quintal)
1985-86	640	127.871	306.00
1986-87	689	525.891	819.40
1987-88	611	152.551	287.58
1988-89	433	140.311	295.66
1989-90	400	133.191	268.80
1990-91	318	76.600	157.70
1991-92	347	72.691	147.10
1992-93	234	14.801	28.29
1993-94	173	30.46	99.95
1994-95	199	28.58	78.16

The areas most vulnerable to illicit cutting are border areas adjoining Kodinar, Dhari, Una, Visavadar and Talala Talukas. Another damage to the forest is inflicted by the resident Maldharis and forest settlers. Maldharis staying in nesses usually do not resort to illicit cutting except for their requirement. However, they do cause considerable damage by lopping trees, when the grass is scarce and also during shifting of their nesses. They cut trees at new sites to construct their new huts.

(d) Poaching

Although the level of poaching in Gir is negligible, it requires high degree of vigilance. Gir is almost free from organized form of poaching which may prove dangerous for any protected area. Recently the forest officials unearthed an organized form of poaching by a local community for selling Lion nails in the eastern portion of

Gir. Besides this, there are some stray incidences of poaching for meat and trophies but well within control.

Presently killing of wild animals by people in almost all cases are a retaliatory action since the carnivore animals are moving outside the PA and killing livestock in the villages adjoining PA and also since the herbivore animals enter agricultural fields and damage the crops in these villages. But for the strict protection measures, high degree of vigilance over such nefarious activities is required, otherwise these activities may assume alarming proportions.

The poisoning of the felines, both Lions and Leopards is the worst kind of fate the great carnivores are subjected to. Table 3 shows the number of such incidents during the past five years in Gir.

(e) Traffic, Transport and Communication

Roads : There are 7 State highways passing through sanctuary and national park area. State transport buses, heavy and light vehicles plying on these roads create disturbance in normal movement of animals along and across the roads and also creates artificial compartmentalization of natural ecosystem. Table 4 shows the State highways passing through sanctuary and national park.

The Gir forest is also provided with a network of fair-weather forest roads which are well connected with State highways. These roads also create problems such as fire hazards, theft of firewood, timber and MFP. In spite of strict rules and regulations imposed on vehicular traffic so as to create minimum disturbance to the wildlife, these roads always remain busy. Some part of

Table 3
Poaching of wildlife in Gir in last five years

Animal	1991-92	1992-93	1993-94	1994-95	1995-96
Lion	2	1	0	1	3
Leopard	0	2	0	1	2
Spotted Deer	1	2	0	1	1
Chinkara	0	1	0	0	1
Bluebull	3	0	0	0	1
Blackbuck	0	0	1	0	0
Python	3	1	0	0	0
Porcupine	0	5	0	0	0
Peacock	0	0	4	1	2
Wildboar	1	1	0	0	0
Total	10	13	5	4	10

Table 4
State Highways passing through Sanctuary/National Park area

Name of road	Length (km)
Una-Dhari via Tulshishyam	17.1
Jamwala-Sapnes-Dhari	33.7
Mendarda-Sasan	5.6
Sasan-Visavadar	14.4
Sasan-Talala	1.6
Talala-Jamwala	8.9
Jamwala-Una	19.4
Total	100.7

most of the roads passes through heart of the PA. The traffic plying on these roads creates an ecological divide due to constant disturbance. The vehicles many times run over smaller animals like mongooses, jungle cats, monitor lizards and snakes. Sometimes bigger animals also get injured by these vehicles. Besides this, there is always demand from people to convert some of the roads to tar roads which may further accentuate the problem. Table 5 indicates increasing trends of vehicular traffic passing through checkpoints (nakas).

Railways : Fifteen kilometers of railways track between Visavadar and Talala passes through sanctuary area and there are six trains plying on this particular track. Few other tracks are in the proximity of the forest. The steam locomotives plying on these tracks pose a big hazard from forest fire. Also as many as 12 Lions/Lionesses had been killed on this track between 1984 to 1995. Efforts are being made to reduce the speed and the number of trains. Although railways authorities have agreed to discontinue the use of steam locomotive but they hardly maintain the prescribed speed (Railway Ministry has given a directive to run the train at the speed of 20 km/hour with two dead stops between Kansia and Sasan-Gir section).

(f) Pilgrimage

There are three main temples, namely, Kankai, Banej, and Tulsishyam situated in PA and the location of temples makes them unique due to their surrounding forest, dense vegetation and the river passing by. These temples attract thousands of tourists every year.

Table 5*Number of vehicles passing through checking nakas in Gir*

Year	Name of checking nakas									
	Fudridhar	Sirvan	Dedakadi	Kansia	Viravan	Jhankia	Vaniavav	Timbarva	Jasadhar	Total
1990-91	10830	386	57	15235	21352	2997	43220	24514	14094	132685
1991-92	11588	499	49	23822	42782	2962	39024	26735	13546	161007
1992-93	11030	163	49	18353	42971	2568	40380	27392	14194	157100
1993-94	11830	206	18	29521	48673	2983	41940	28482	14302	177955
1994-95	9080	539	42	24614	52478	4676	42612	28615	15544	178200
1995-96	9950	2233	19	20370	99540	9877	45879	15590	19926	223384

Table 6*Number of vehicles and pilgrims visiting temples in Gir forest.*

Year	Kankai		Banej		Total	
	No. of vehicles	No. of pilgrims	No. of vehicles	No. of pilgrims	No. of vehicles	No. of pilgrims
1987-88	1949	8086	887	7838	2836	15924
1988-89	549	4756	459	4984	1008	9740
1989-90	1097	6978	514	4313	1611	11291
1990-91	775	6331	1306	18786	2081	25117
1991-92	1354	4849	1346	12039	2700	16888
1992-93	2552	26220	1699	16306	4251	42526
1993-94	3220	29109	1254	9598	4474	38707
1994-95	2684	28085	1031	9526	3715	37611
Total	14180	11414	8496	83390	22676	197804

Nearly one lakh pilgrims are visiting Tulsishyam annually, where another 40,000 are visiting Kankai and Banej. Table 6 shows number of pilgrims and vehicles visiting Kankai and Banej.

Since the pilgrims are from far off places they need accommodation for their stay at night. The temple trustees have future ambitious expansion plans also. The people living around Gir are very religious in nature and therefore, it becomes very difficult to check their ever increasing flow towards these temples. At the same time it

is easier for the manipulator to play with their religious sentiments and create issues. The disturbance to the wildlife therefore, continues to remain as a problem without any possible solution. Due to sensitivity of this issue, the ever increasing traffic, despite the best efforts still remains unchanged.

There are other seventeen small and unauthorized temples or religious sites in Gir where local people visit during special seasons and occasions. The strong religious sentiments of the local people make it very difficult to check the development of these

religious places.

(g) Development of Tourism

Whereas tourism, for its significance as public awareness is necessary, if allowed to develop beyond limits, it may lead to lot of disturbance to the wildlife. Gir receives thousands of tourists every year. Table 7 shows the number of tourists visiting Gir annually.

Table 7
Number of tourists visiting Gir

Year	No. of visitors		
	Indian	Foreigners	Total
1985-86	30338	262	30600
1986-87	38833	414	39247
1987-88	17591	392	17983
1988-89	28258	854	29112
1989-90	33334	997	34331
1990-91	36262	822	37084
1991-92	44990	978	45968
1992-93	47232	988	48220
1993-94	41429	823	42252
1994-95	56753	853	57606
1995-96	75388	2493	77881

The routes for tourism are also specified. However, the development of tourism in the form of hotel business and the stake involved in it may be quite detrimental to the wildlife in long run as the management of these hotels with the connivance of local staff may indulge in illegal practices also.

(h) Industries and Mining

Large scale industrial development has taken place during recent past, on the coastal belt near the Gir. Nearly 27 small and big industries have come up during last five

years. Several industrial giants are still coming forward to establish new industries. The cement manufacturing plants in particular, sustain upon the limestone giving protection to the reserve forest i.e. PA from the outside influences areas around the forest and adjoining to the surrounding villages are notified as protected forests. With the Forest Conservation Act (1980) coming into force, all activities including mining in these areas also were prohibited and hence practically extraction of limestone is confined to the areas outside the forest only but the fringe forest area is also rich in limestone. So the industrialists have their eyes on the forest area. This industrial conglomerate has enough influence in politics and hence they are posing major threat to the Gir PA.

After 1990 the big cats started moving out and presently they are living in four to five satellite populations outside the Gir PA. They made their permanent home in coastal boarder forest area and in Girnar. So all the industrial developments are taking place in the extended habitat of big felines. The expansions of industries have also threaten coastal border forest that is the new habitats of Lion.

In the recent development the village Panchayat and District authorities have started giving the wastelands, adjoining to the Gir, for blackstone and limestone quarrying. The wastelands that are serving as a common grazing ground for the livestock are now depleting gradually and hence increasing the problem of grazing pressure on the forest.

(i) Forest Fire

The Gir falls in semi-arid zone and the main forest type is dry deciduous forest. Due to accumulation of plenty of

inflammable material like dry grass, dry teak leaves, fallen twigs and other dry vegetational residues on the forest, fire is a common feature in Gir. The most common type of fire seen in Gir is the surface fire that burns the leaf litter, grasses, brushwood and also causes injuries to the standing trees and kills the vegetation. The surface devoid of the organic matter is quickly subjected to more damaging soil erosion following monsoon. The process is slowly and steadily leading to degradation of habitat. The slow moving animals like reptiles and ground nesting bird are also destroyed due to fire. The extent of fire in Gir is presented in Table 8.

(j) Man and Wildlife Conflict

Gir exists an oasis of forest with an interface of over 350 km having large human and cattle population in adjoining villages. Normally animals do not come into conflict with human population but certain precarious situation and changing cropping pattern has increased the frequency and intensity of interaction that results into damage to both sides. Conflict between wildlife and human population in Gir prevails, and sometime escalates, due to increasing human and livestock population,

extensive loss of natural habitats in wasteland and Panchayat land and increase in Lion and Leopard population. Generally conflict arises in the following manner :

- (1) Attack by Lion and Leopard on human beings
- (2) Depredation on domestic livestock.
- (3) Damage to agricultural crop by herbivore animals. This leads to retaliatory form of killing of wildlife.

Killing of carnivores through poisoning their kills were rampant in past, but such retaliatory killing is still being reported and are the greatest threat for the felines moving outside. Farmers sometimes spread live electric wires in their agricultural field which results killing of wildlife. By paying compensation in case of human death (Rs. one lakh) and injuries (Rs. Ten thousand) and to the livestock killed (Rs. 5000) by carnivores attack, the Department is trying hard to earn the goodwill of the neighbouring villagers and to reduce the retaliatory killings. Despite all the efforts still it poses a major threat to the existing population.

(k) Narrow Genetic Base

At the beginning of this century, the

Table 8

Extent of fires in Gir

Year	No. of incidence		Area burnt (ha)		Percentage of total Area
	Gir (W)	Gir (E)	Gir (W)	Gir (E)	
1989-90	179	59	36000	11439	33.5
1990-91	91	47	13821	6379	14.3
1991-92	49	36	3526	2084	3.9
1992-93	25	39	2068	3628	4.0
1993-94	29	23	8546	4035	8.0
1994-95	6	10	1216	1206	1.6
1995-96	11	23	414	679	0.8

estimated Lion population in Gir forest was around 12 to 20. The present population of 300 and odd Asiatic Lions is from a very small group of animals. So there are possibilities of inbreeding defects. While identifying the pure breed of Asiatic Lions the researchers have proved that there is homozygosity of genes in case of Asiatic Lions. Entire endangered population of Lions is confined in Gir only so they are very much vulnerable to any contagious disease. There are scientific arguments to shift few pairs of Asiatic Lions to other suitable habitat and to create few other isolated population of Asiatic Lions.

(1) Administrative shortcomings

The democratic way of administration is again a hindrance to win the battle. The management of the protected areas on

purely scientific basis is always beyond the understanding of a common man. The people will be driven by the instincts and they do not have enough understanding as to why regulations like control of illegal grazing, lifting of stones etc., should be applied at all. These regulations prove very harsh for them in the absence of proper scientific understanding. In the democracy peoples' will, however absurd, can not be overlooked easily and therefore the task of protection becomes more difficult.

Lack of scientific knowledge and pragmatic approach towards wildlife management among subordinate staff is another administrative problem because while posting a person in Gir PA, it is not taken into consideration that whether a person is trained in wildlife or not.

SUMMARY

An indepth analysis of threats to Gir ecosystem has been attempted in this paper. The major threats to which Gir forest is vulnerable are mostly anthropogenic which *inter alia* include illegal grazing by domestic livestock, encroachment in the P.A., illegal removal of forest produce, poaching, traffic and transport, pilgrimage, tourism, development of industries and large scale mining, forest fires and man-wild animal conflicts. The quantitative and qualitative assessment of these threats depicting trends in recent past have been described in detail. Narrow genetic base due to inbreeding also poses a significant threat to the survival of Asian Lion. Administrative shortcomings which are proving to be a bottleneck in the efficient management of the P.A. have also been discussed.

गिर परिस्थिति - संहति को होने वाले खतरों का विश्लेषण

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सारांश

गिर की परिस्थिति-संहति को होने वाले खतरों का गहराई से विश्लेषण करने का प्रयास प्रस्तुत अभिपत्र में किया गया है। गिर वनों को पराजेय बनाने वाला सबसे बड़ा खतरा अधिकतर मानवजनित है जिसके साथ-साथ उसमें पालतू पशुओं द्वारा अवैध चराई, संरक्षित क्षेत्र में अनधिकृत प्रवेश, वनोपजों की अवैध निकासी, चोरी से शिकार, यातायात और परिवहन, तीर्थयात्रा, पर्यटन, उद्योगों का विकास और बड़े पैमाने पर खनिकर्म, जंगल में लगने वाली आग तथा मानव और वन्य प्राणियों का संघर्ष भी मिल जाते हैं। इन खतरों का मात्रात्मक और गुणात्मक आकलन, जिनमें उनकी निकट भूतकाल की प्रवृत्तियाँ भी सूचित हैं, विस्तार से बताए गए हैं। अन्तःप्रसवन होने के कारण संकीर्ण आनुवंशिक आधार भी एशियाई सिंह जाति के जीवित बने रहने में भारी खतरा बन रहा है। प्रशासनिक कमियों पर भी, जिनके कारण संरक्षित क्षेत्र का दक्षतापूर्ण प्रबन्ध करने में जगह-जगह व्यवधान पड़ जाते हैं, विचार किया गया है।

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