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## Survival of the Rarest Subspecies (Tiger) Against the Genetic Diversity: A Challenge to the Ecologists

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**Abstract** Continuous extinction of tigers from the earth has become a matter of concern among the ecologists. Once upon a time the species which was dominating all along the globe is presently in an endanger condition searching for food and shelter. Continuous poaching by the people for no reason has reduced their population to numbers which can be counted in figures. Different countries have set their own tiger projects to save this endangered species for balancing the entire ecosystem. The state of Odisha in India is not away from this situation and the crucial period has already come to save their lives. Odisha enjoys a big tiger sanctuary named Similipal tiger project where good numbers of tigers are present besides few more tigers are also located in different parts of Odisha. Nandankanan zoo at Bhubaneswar the state capital has been providing a shelter for tigers and maximum care has been taken for the tigers to give certain environment for their breeding and it has been found successful for their increase.

**Keywords** *Tiger, Project Tiger, Tropical Forest, MoEF*

### 1. Introduction

One of the largest subspecies existing in the earth defined as tigers, which once lived across a large portion of northern China, the Korean peninsula, and the southernmost regions of far east Russia most likely during the early 20th century, is almost driven to extinction, as expanding human settlements, habitat loss and poaching create this endangered species to get them extinct. The effective population of tigers in the world is a measure of their genetic diversity. At the start of the 20th century, nine subspecies of tigers existed, with a total world population of more than 1, 00,000. Human activities have deteriorated the situation and made it worse leaving behind 3000 active breeds. The situation still worsened in 1940s when only 20 to 30 existing Caspian tigers were traced and later on due to a ban on hunting and a remarkable conservation effort, it slowly helped the tigers recovering steadily, although their genetic health hasn't improved till date. As per the research already conducted by several scientists the effective population of any group of animals will be lower than the number that actually exist, due to the factors such as non-breeding individuals or a skewed sex ratio.

There is little sharing of genes across the development corridor, suggesting that these populations are fairly discrete. This shows how and why the population of tigers is reducing by their numbers in the future to come. Continuous reduction of the number of tigers in the world as a whole and India in particular has left the researches to adopt innovative methods for their conservation.

### 1.1. Causes of Extinction

Of the eight original subspecies of tigers, three have become extinct in the last 60 years, an average of one in every 20 years. The details of the extinction period and numbers present are presented in Table 1.

**Table 1:** Extinct and existing tigers across the globe

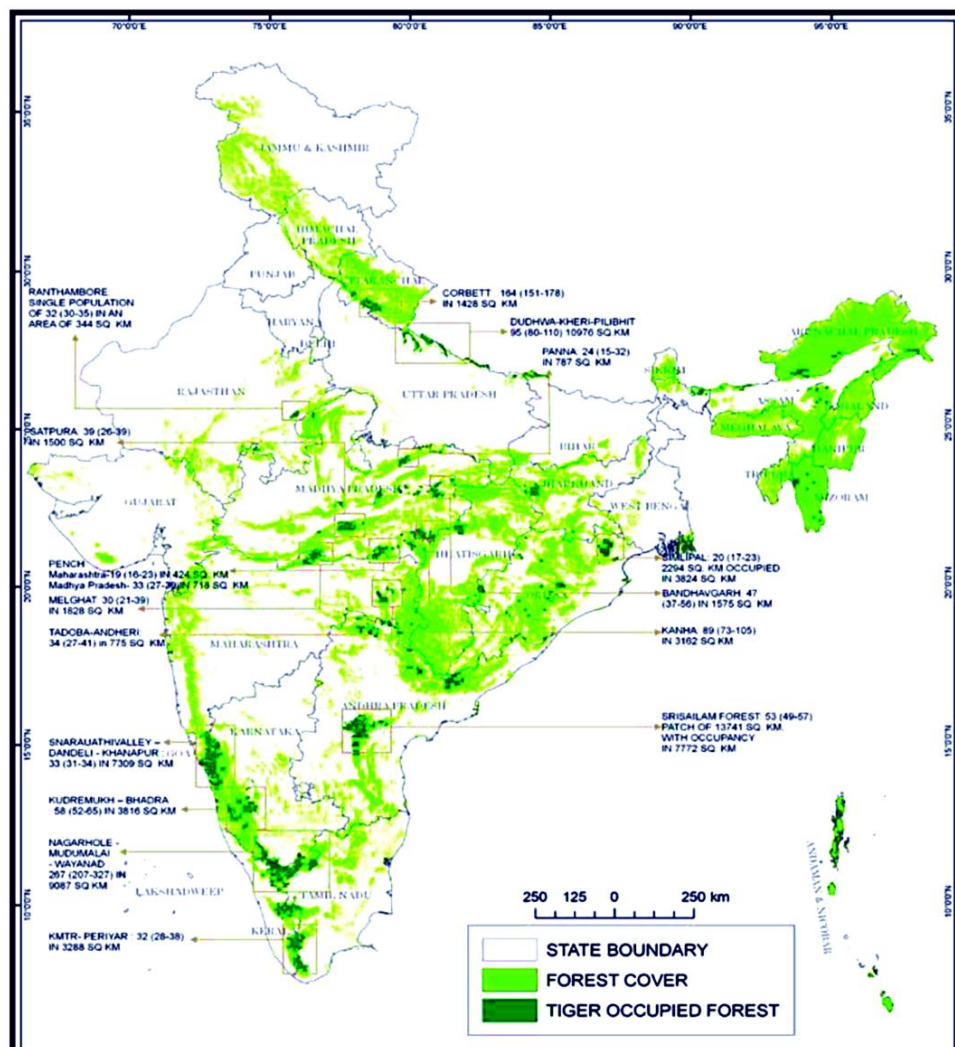
Sl. No.	Type of Tiger	Extinction Period	Existing Nos.
1	Bali Tiger	1930	
2	Caspian Tiger	1970	
3	Javan Tiger	1980	
5	Amoy Tiger		50
6	Amur Tiger		150-200
7	Indochinese Tiger		900-1200
8	Sumatran Tiger		400-500
9	Bengal Tigers		2700-4300

The essential requirements for the survival of tigers are as follows:

- water to drink
- animals to hunt
- vegetation to hide
- agricultural expansion
- timber cutting
- construction of new roads
- human settlement
- industrial expansion
- hydroelectric dams

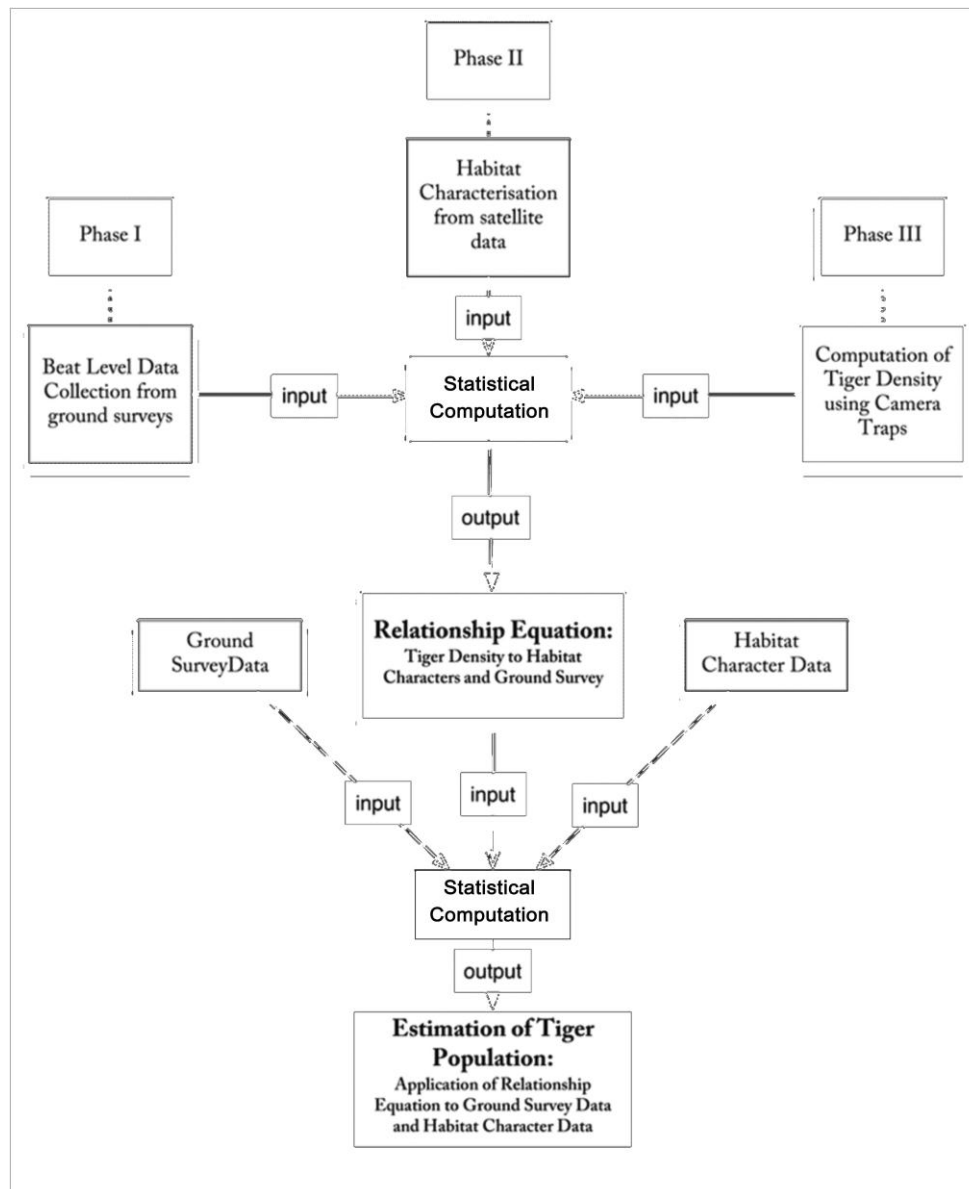
Due to increasing wild life hunters, mammoth growth of human population, poverty driven poor people augment squeezing the safe areas for the tigers to live in which in due course is primarily responsible for reduction in number of tigers. As a say, wild animals always require safe heaven to live, which is practically reducing day by day. Due to infrastructural developments, construction of roads and highways, eventually mountains, dense forests and bushy grasses have disappeared and tigers are deprived of their shelter. Tigers are compelled otherwise to depend on domestic animals and even human beings because the target of food that the tigers have been utilized by present human being (Tigers are one of only two animals; the other is the polar bear that are known to stalk humans). Threatened villagers often poison, shoot, or snare the encroaching tigers. In addition to food, local communities also need to use the surrounding patches of forest for livestock grazing and wood for fuel. Establishing wildlife reserves is the only option left to protect tigers from poachers and the rapidly increasing loss of land by wildlife conservationists. The tigers are hence isolated and even if they suffer from getting suitable place for breeding. The ecology in all respect must be supportive for conducive breeding, but unfortunately lack of terrestrial region for them is a matter of concern for the next generation to come since it entirely provokes dis-balancing the whole ecosystem. Central and

state government machineries who are specifically assigned to protect are quite deficient to protect. Lack of training, unavailability of firearms with the security personals, absence of modern equipment have rendered increase of poaching across the globe in general and Odisha in particular. Central government funded and state (Tigers are one of only two animals; the other is the polar bear that are known to stalk humans). Threatened villagers often poison, shoot, or snare the encroaching tigers. In addition to food, local communities also need to use the surrounding patches of forest for livestock grazing and wood for fuel. Establishing wildlife reserves is the only option left to protect tigers from poachers and the rapidly increasing loss of land by wildlife conservationists. Central government funded and state government supported "Project Tiger" has got better response initially but unfortunately it did not work as per the expectation [1]. Still the number of poaching is one per year [2, 3]. The reduction in numbers is perhaps by illegal trade of tigers and their body parts as referred by Dhayni, 1994; Jha, 1995 and Mukherjee, 1995 [4, 5, 6].



**Figure 1:** Population of tiger estimation in 17 states of India  
(As per the Ministry of Environment and Forest, 2010)

The results indicate that tiger populations are viable within protected areas but are under threat outside them (Figure 1). This procedure involves rigorous statistical analyses and is far more accurate than earlier methods. It is conducted in three phases and involves ground surveys, analyses of satellite data and camera traps (Figure 2).



**Figure 2:** Schematic diagram of computation for tiger population  
 ((Ministry of Environment and Forest (MoEF), 2010)

## 2. Materials and Methodology

The paper basically depends on long term understanding of socio-economic-political scenario of tiger reserves in India with special reference to the state of Odisha. However, different sources are used to draw various results in connection with the study. The published records, research papers and reports were extensively studied to construct a base for the paper. Statistical report based on MoEF with schematic diagram is presented to find a general review of remaining existing tiger reserves. Consultations were also used in different levels to get suitable line of understanding and community attitude towards the reserve [7].

## 3. Results and Discussion

The tropical forest management based on the European concept has failed (Jha, 2000) [8] and must be changed. The scenario of Odisha's jungle is also same to the rest of failed stories of forest

management. In Odisha, due to the consequence of Maoist extremist domination of the forest, and illegal log cutting and smuggling in southern Odisha, reserve forests have become decimated in the last decades. This protected reserve forests that is adjacent to communities essentially has few or no trees. The same is the condition in the northern Odisha, where large number of tree cuttings by mafias has made the tigers homeless. By the result tigers do not get a conducive environment for breeding and new generations have gone to a halt. Any news circulated about the increase of tigers, they are either outsourced or birth of tiger cubs in the Nandan Kanan zoo. Simlipal tiger reserve has very few instances of new tiger cubs. Under the umbrella of nature breeding of cubs is rare. Besides in the recent past, due to global warming and greenhouse effect the soothing climate is no more existing and temperature of the state is soaring up to 48 degrees to 49 degrees which make those tigers impossible to survive resulting death of few. Besides, poaching is the other major problem. This species has become the most threatened large carnivore in India. It has been used as the main flagship species in India to protect a wide diversity of other species. However, most of the tiger habitats are wide and close to human dominations. The contemporary conservation practice also started recognizing the need of community intervention for effective conservation of these large animals. The lack of bare minimum support and guidance on regular basis is a great setback for the whole initiative and adversely affecting the conservation zeal of the community. Proper support from concerned agencies & departments for sustainable running of tiger protection programme providing sufficient knowledge to the tribes of Odisha to maintain a community for protecting the tigers may definitely stabilise the ecosystem in the future to come.

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