

# BANDHAVGARH NATIONAL PARK

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FROM GUNS TO CAMERAS



Discover India Program

2017-18



# **Bandhavgarh National Park: From Guns to Cameras**

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**DISCOVER INDIA PROGRAM**

**2017-18**

**December 2017**

## CERTIFICATE

This is to certify that the work incorporated in this report entitled “*Bandhavgarh: From Guns to Cameras*” submitted by the undersigned Research Team was carried out under my mentorship. Such material as has been obtained from other sources has been duly acknowledged.

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## **Abstract**

Situated at the heart of India in the state of Madhya Pradesh, Bandhavgarh National Park (BNP) is a game preserve turned national park with a rich cultural and mythological past, and one of the highest tiger densities in the world. Conservation of tigers and other wild animals has been the cardinal goal of the park. The evolution of conservation approaches over the years has impacted BNP in a sociological, ecological and economic manner. Since the emergence of post-independence policies, there has been a constant friction among the stakeholders of the park, the Forest Department and the local community. Forests have long been the homeland of various tribal and local communities who now suddenly find themselves at loggerheads with the government that struggles to maintain a balance between sustainable wildlife conservation and community development. Sixteen forest officials and 71 households were interviewed from 7 villages situated in and around BNP. Interviews and Focused Group Discussions (FGDs) were conducted to identify the community's and Forest Department's perspective and relationship with the park. Three aspects were considered while studying BNP, ecological, sociological and economic. Ecologically, the park and community face human-wildlife conflicts, and an irregular change in forest cover. Sociologically, the park faces the issues of inadequate compensation through the relocation policy; and the Forest Department finds itself in need of revising salaries, incentives and working hours. To have a more inclusive approach, the local community was looked at in a heterogeneous manner, taking factors such as gender, literacy and caste into account. Economic aspect involves the problems due to restrictions on the collection of NTFPs, which is one of the major sources of livelihood in BNP. Another source of income, ecotourism, plays an important role in the conservation of biodiversity and economic development of the local community. The aim is to study these aspects through the three conservation models; fortress, community-based and market based, evolved due to the change in conservation policies. There has been a glaring lack of research on as important tiger reserve as BNP, concealing the numerous issues faced by the stakeholders. This research throws light on the same while suggesting ways to eradicate the problems, in a way that all sections of the society despite the social hierarchy benefit equally.

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# Introduction



## **1.1 Introduction**

Protected Areas (PAs hereafter) are one of the most important tools to conserve wildlife and biodiversity. PAs can be defined as clearly demarcated geographical areas that are accepted, supervised and committed via legal provisions to promote and attain conservation of nature in the long term, along with the connected ecosystems and culture of the area (IUCN, 2017). The International Union for Conservation of Nature (IUCN) classifies these areas into internationally recognised categories for better management of the same. These include nature reserves, wilderness areas, national parks, natural monuments, habitat management areas, protected landscapes and protected areas which have sustainable use of natural resources (IUCN, 2017).

India is one of the twelve mega-biodiversity regions of the world. Forests have long been the homeland of various tribal and local communities who now suddenly find themselves at loggerheads with the government. Increased habitat loss, poaching, and broader issues of climate change have hastened species extinction to a rate that is much higher than what nature intended. This ecological catastrophe is leading to more than just a cultural loss of iconic species but is also affecting livelihoods of communities worldwide (Sawhney, 2003).

In a country that is already dealing with increasing population pressure thus resulting in many pressing social and economic issues, it is becoming increasingly difficult to protect and manage the PAs.

Bandhavgarh National Park (BNP), located in the state of Madhya Pradesh, India, is a game preserve turned national park. It derives its name from the ancient Bandhavgarh Fort situated in the region (Sawhney, 2003). The International Union for Conservation of Nature (IUCN) describes National Parks as vast natural or almost-natural areas which are kept aside to safeguard ecological processes with the complimentary ecosystem and species of that particular area. They serve as the basis to ensure cultural and environmental harmony with the scientific, recreational and educational activities carried out in the area (IUCN, 2017).

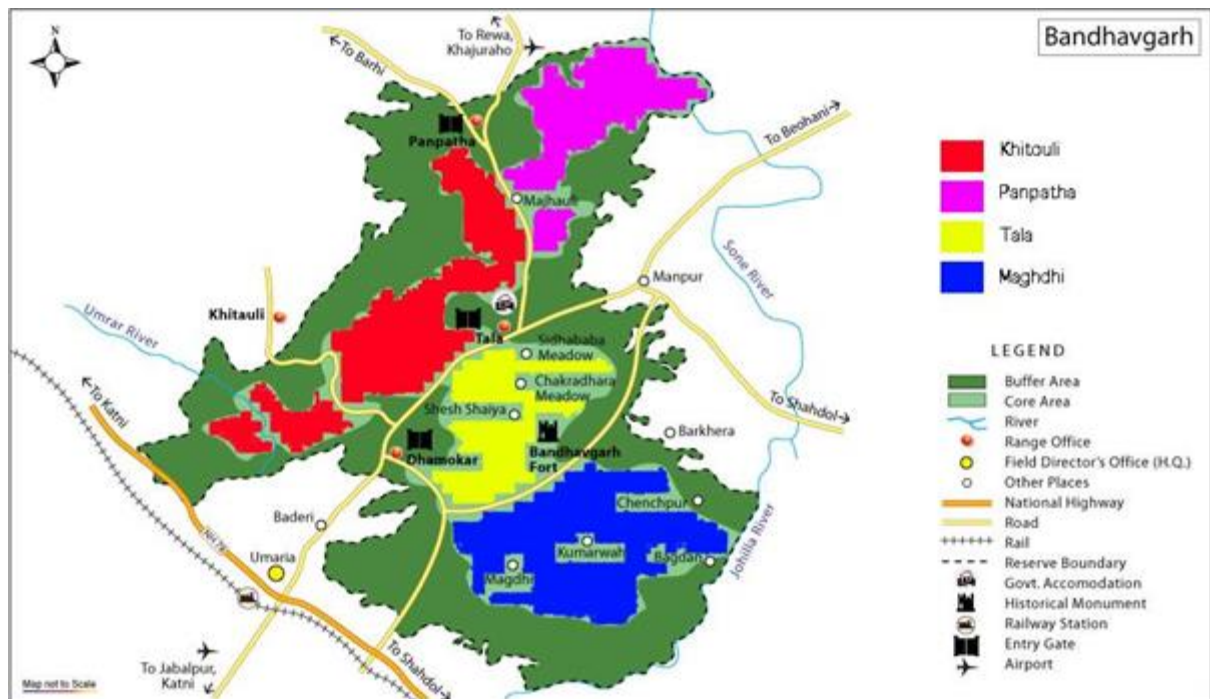
BNP is an ideal area to study the complexities involved in wildlife conservation, as it has the highest tiger density in the world. This study on BNP aims at being exploratory and evaluative in nature.

Since the time the indigenous communities realised that their access to forest resources, on which they have always been very dependent, has been curtailed, the ones managing these PAs

have had to face a host of problems including human-wildlife conflict. Despite available penal provisions, it is indispensable that support of the local communities be present not only for the sake of conservation but also so that they are able to promote eco-development activities in the fringe villages to minimise this conflict.

During the course of the research, multiple serving senior and junior officials of the park as well as the local communities were interacted with in an attempt to understand and address the above-stated issues.

Bandhavgarh has a rich cultural and mythological past. Hence, in addition to the ecological preservation, the region is also of great archaeological and historical importance. While formerly being the hunting ground of the Maharajas of Rewa, BNP is now famous for being home to the highest density of tigers in the world (Sawhney 2003).



**Map 1: Ranges of BNP**

Source: D-Maps (Made using Photoshop)

**a) Location, Coordinates and Area:**

Bandhavgarh National Park forms a part of the Central Indian Highlands in the central Indian state of Madhya Pradesh. It is nestled between the Vindhyan and the eastern flanks of the Satpura range of mountains. It falls mostly in Umaria and Katni districts of Madhya Pradesh, India. The coordinates for the park lie between 23 °30" 08" to 23° 57" 01" N and 80° 47' 05"

to 81°11' 43" E at altitudes between 410 m and 810 m above mean sea level (Prakasam, 2006). It is largely surrounded by the Umaria Forest Division, and a short stretch in the west is surrounded by the Katni Forest Division and North Shahdol Division in the northeast. The entire ecological space is divided into two conservation units, which are the Bandhavgarh National Park and the Panpatha Wildlife Sanctuary. The land area of BNP is 448.842 sq. km. The Panpatha Wildlife Sanctuary spans across 245.842 sq. km. Hence, the total land area of the Tiger Reserve is 694.468 sq. km. (Prakasam, 2006).

**b) Climate:**

The Reserve lies in the tropical zone and has three distinct seasons: winter, summer and monsoon. Because there is great fluctuation in the weather in terms of temperature, humidity, winds and precipitation in each of these seasons, the weather serves as a controller of vegetation and animal habits in the area (Prakasam, 2006). The average rainfall received is around 1173 mm, majorly during monsoon. The temperature may drop down to 2°C in peak winter and reach 40°C in the summer (Chandra, 2009).

**c) Forest and Water sources:**

The dense forest of the Reserve is majorly composed of moist, tropical and deciduous trees, largely mixed deciduous forests. The dominant tree species are Sal and Bamboo. There are plenty of large grassy patches and meadows inside the area. Over twenty streams rise in the Reserve and flow through it. Umrar, which also forms the western boundary of the Reserve, is the largest stream. Almost all of the main streams flow into the Son river, which is a major tributary of the Ganges (Chandra, 2009).

**d) Flora and Fauna:**

BNP is a part of the Indo-Malayan realm floristically. The vibrant ecosystem provides plenty for every living creature- from minuscule butterflies to the majestic tigers (Prakasam, 2006).

The national park is a unique and priceless reserve of wild fauna. It boasts of the highest density of tigers in the world. The floral melange consists of around 515 plant species with Sal being the main tree species (Sawhney, 2003).

BNP supports 37 species of mammals, 72 species of butterflies, over 250 species of avifauna, a huge range of reptiles and invertebrates and a rich fauna of medicinal plants (Sawhney, 2003).





**Image 1: Biodiversity of BNP**

Source: Discover India Program, 2017 – 2018

## 1.2 History of the Park

BNP was declared a national park in the year 1968; at the time covering an initial area of 105 sq. km in Tala range. In 1982 three more park ranges, Khitauli, Magdhi and Kallawah, were added to Tala. This expanded the area of the park to 448 sq. km. In 1993, BNP incorporated the Panpatha Sanctuary, thus increasing the total area to 694 sq. km . A buffer zone of 437 sq. km. was also included. This fundamentally enlarged the total land area of the reserve to 1161.47 sq. km (Chandra, 2009).

### 1. Mythology:

In Hinduism, traditionally, reverence is paid to five basic natural elements: Earth (*Prithvi*), Water (*Jal*), Wind (*Vayu*), Fire (*Agni*) and Sky (*Aakash*). These elements are protected for religious, spiritual and cultural reasons by various communities across the nation. Nature worship is an integral part of Hindu tradition. There are rituals that are related to specific trees, such as the banyan tree or mango tree. Many Hindu deities have animals as their vehicles. Communities like the Bishnoi and Bhil tribes of Rajasthan view conservation of their

environment as part of their Dharma. They cite Upanishad and other Hindu scriptures to justify their conservation practices (Jain, 2011).

For over 2000 years Bandhavgarh in Madhya Pradesh has been a centre for settlement and human activity. References to Bandhavgarh have been found as early as 300 AD (Sawhney, 2003). According to a legend, the hero of the Hindu epic “The Ramayana”, Lord Ram, stopped at Bandhavgarh on his journey back to his homeland after defeating Ravana, the demon king of Lanka. It is believed that the creators of the Bandhavgarh fort are the same two monkey architects who engineered the Setu Bridge between the mainland and Lanka. Later on, Lord Ram handed over Bandhavgarh fort to his younger brother Laxmana. Laxmana eventually came to be known as “Bandhavdhish”, which means ‘The Lord of the Fort’, and it is believed that there is a temple in Bandhavgarh where Laxmana is worshipped (Prakasam, 2006).

## 2. Dynasties:

The caves dug into the sandstone to the north of the Bandhavgarh fort reveal Brahmi inscriptions dating back to the 1<sup>st</sup> century B.C. The direct ancestors of the present royal family of Rewa were the Baghel Kings. The Baghel Kings had established their dynasty in Bandhavgarh in the 12th century. They maintained Bandhavgarh as their capital until 1617 after which the court centre moved base to Rewa. Post this, Bandhavgarh lost its royal patronage and began to become more and more barren and deserted. Once, the area was overrun with forest cover, it became the royal hunting reserve (Prakasam, 2006).

## 3. Post-colonial:

Around the time of India’s independence, Bandhavgarh was under the Maharaja as his private property, which he later handed over to the state for the formation of a National Park, today known as Bandhavgarh National Park. After the creation of the park, one of the first steps taken was to control poaching. This led to a drastic increase in the number of animals in the national park. The village residing within the park boundaries was relocated and the grazing activities by the local cattle inside the park were stopped. As a result, the tigers in the park prospered in particular and the extension of the park in 1986 provided much-needed forest area to accommodate these increasing numbers (Sawhney, 2003).

### **1.3 Research Statement and objectives**

“To study the evolution of conservation approaches and their sociological, economic and ecological impact on Bandhavgarh National Park (BNP) in Madhya Pradesh, India.”

Research Objectives:

1. To study the overall ecology of BNP, with a particular focus on Human-Wildlife conflict and Land Use and Land Cover Change (LULCC).
2. To examine various economic activities of the local communities in and around the National park and how they are affected by the different conservation paradigms.
3. To investigate people park interactions, particularly the social relations between different stakeholders.

### **1.4 Rationale**

According to the zoological survey of 2009, BNP has one of the highest tiger densities in the world, yet it remains under-researched in ecological, sociological, and economic terms. By virtue of being the top predator, the tiger functions as the umbrella species for the conservation of biodiversity. Its conservation automatically ensures the conservation of a large number of flora and fauna and entire ecosystems. Thus, a properly planned tiger conservation program is essential to protect and save a large number of faunal species.

The nature of people-park relations has changed considerably since the emergence of post-independence forest policies. This research aims to trace back the change in the relationship between different stakeholders of the park led by these policies.

In India, the wildlife areas are inhabited by both humans and wild animals. While studying the adverse effects of the formation of Protected Areas on the local communities, the communities are usually considered a single entity, dismissing the issues of certain marginalised groups of the community.

This research offers a discussion on sustainable community development and wildlife conservation.

## **1.5 Limitations**

- Forest officials were wary of sharing information about community management and their relationships with the villagers. They seemed to talk about the working of the forest department in an idealistic manner. Therefore, the credibility of the information may be questionable. However, during the field work, efforts were taken to dissect the information provided by forest officials.
- The research aimed to study gender roles in the communities in and around the park. A gender study in conservation is very intricate and requires the researcher to spend a lot of time with the men and, especially, the women of the village. Due to the limitations of the timeline, engaging the women of the communities in purposeful conversations was a challenging task.
- Another limitation was the lack of academic research on the conservation approaches employed in BNP. Secondary data was primarily based on studies on other protected areas of India. The studies on BNP are very old, the most recent one being Puja Sawhney's dissertation from 2003.
- As a part of human-wildlife conflict, the research aimed to obtain information on the prevalence of hunting practices in the region. However, the forest officials did not go on the record to talk about the sensitive issue of hunting and poaching.

## **1.6 Research Methodology**

The study employed a mixed-methods approach which included both qualitative and quantitative techniques for data collection. The sample comprised of the 7 villages of Guruwahi, Kuchwahi and Ranchha, located in the buffer area and Garhpuri, Kathali, Lakhumar and Bamera, located in the core area of the park. The villages were chosen based on their proximity to the park (10km radius of Tala zone<sup>1</sup>). The Tala zone of the park has the highest number of villages in the Bandhavgarh region. Over the course of six days, a total of 71 households which is roughly 10 percent of the total number of households in the sample region i.e.744 (Indian National Census, 2011) was surveyed. Additionally, a total of 15 forest officials and guards working in BTR at various ranks were interviewed. Random technique of

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<sup>1</sup> One of the five ranges of BNP

snowballing was used for sampling. All the interviews were taken based on informed consents of the respondents. The primary stakeholders for our research are as follows -

#### Local Communities:

The local communities living in and around the park were the primary stakeholders of this research. These communities are directly affected by the conservation policies employed by the state government. Therefore, it was impertinent to study their perceptions and attitudes towards these policies for the purpose of this research.

#### Forest Department:

The conservation approaches prevalent in the park are largely dependent upon their execution by the forest department. The role of the department is to manage the forest resources and work towards the development of the local communities of the park. Hence, in-depth interviews with officials and guards of the department provided gave valuable insights on the complex task of forest management, their conservation efforts and their relationship with the local communities.

#### Qualitative Methods:

Qualitative methods were used to map the attitudes of the villagers towards conservation, relocation attempts, human-wildlife conflict, and the forest department. These methods included non-participant observation, in-depth semi-structured interviews and focus group discussions. The dominance of few individuals over others in focus group discussions was one of the limitations of this technique for this research. Despite many efforts to form homogenous groups for the discussion, they were largely controlled by a few while others remained inactive. Audio-visual recording of some interviews was done based on the consent of the respondents. Villagers were also asked to draw mental maps based on their perception of the layouts of their villages to obtain information on the relative proximity of households of certain social groups to the village resources.

Recurrent themes and patterns from the interviews were identified. These were used to develop codes and subcodes, for coding of transcriptions of the interviews. Relevant quotes were extracted from the transcriptions under each code for every participant and compiled in a spreadsheet. These quotes are presented throughout the report to add context to the analysis.

Furthermore, field notes of all the members of the group were used as references for the analysis of gender roles and attitudes towards the park in local communities.

#### Quantitative Methods:

Quantitative methods of data collection were used to gather information on Land Use and Land Cover Change (LULCC), biodiversity of the park, human-wildlife conflicts and income generating activities in the region. The data was obtained using close-ended questionnaires, wildlife census and forest department reports. A pilot survey was conducted in the villages of Kuchwahi and Guruwahi to design close-ended questionnaires on sources of income in the region. Additionally, the *sarpanch*<sup>2</sup> of each village was asked to fill out a village form to obtain the village demographic data.

For analysis, all quantitative data was compiled under each code into spreadsheets. The data was analysed using summary statistics and likelihood ratio chi-square tests to check whether there is a significant difference between the responses of different groups of villagers based on gender, caste and literacy levels.

To map the change in land use patterns and land cover, satellite imagery from Landsat 4-5 and 8 was used to create enhanced RGB images of the region (refer to page 35 and 36 for detailed methodology). The aim was to study the change in forest cover and land use from the formation of the park in 1970 to present day. However, the oldest satellite imagery of the region dates back to 1994. The duration of 23 years from 1994 to 2017 may be inadequate for mapping the changes in forest cover and land use patterns.

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<sup>2</sup> Head of the village



# Literature Review



## **2.0 Literature review**

This chapter focuses on the existing research and literature available on national parks around India. It focuses on the ecological, sociological and economic aspects of national parks. Also, the final section highlights the laws and evolution of policies surrounding national parks from the past nine decades.

### **2.1 Ecology**

Developing a narrative about a protected area is not possible without taking into account the interactions of nature and society within the region. Understanding the synergy of wildlife and human beings is crucial as it helps us in developing practices that do not undermine either of their interests.

Maintaining a national park surrounded by an area where urbanisation and human population are consistently increasing may have adverse effects on the land cover of the region. Looking at the change in land use can help us understand the region better

Thus, the two aspects that we are considering under the aspect of ecology are human-wildlife conflict and changes in land use via Geographic Information System (GIS)<sup>3</sup>.

#### **2.1.1 Human-Wildlife conflict**

Substantial research has been done on the coexistence of human beings and wildlife in the protected areas of India (Ogra, 2009). Local communities and wildlife share the forest region to fulfil their own needs. This has resulted in conflict between the two. The human interference in the habitats of wild animals and vice versa lies at the core of this conflict.

Animals enter human settlements, prey on their livestock and destroy their crops. Many wild animals such as elephants and sloth bears, are notorious for destroying crops in human settlements in and around Protected Areas (Rajpurohit & Krausmann, 2000). Heavy losses incurred by the local communities due to wild animals damaging their crops have instigated hunting and poaching practices as a form of retaliation. Many such incidents have happened

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<sup>3</sup> A system that helps in analyzing, visualizing, questioning and manipulating spatial and geographic data.

including one in Gir National Park where some villagers poisoned the carcasses of animals in retribution to their livestock being eaten by lions (Choudhary, 2000). Displacement of the local communities has created a sense of hostility towards the forest department with regard to wildlife. In Kanha National Park, Ananya Mukherjee noted the indifferent attitude of the locals towards the wildlife. She quotes an angry villager, "I do not care if the wildlife in the forest is alive or dead" (Mukherjee, 2009). This comment stemmed from the challenges faced by the villagers due to the restrictions imposed on them after Kanha was declared a national park (Mukherjee, 2009). High ranking forest officials in BNP stated that they had concerns about the effect of the increase in the wildlife population. An increase in wildlife population would result in increased crop damage which, in turn, could lead to the deliberate killing of wildlife as retaliation (Sawhney, 2003). Another reason for these conflicts in the forest areas is the decreasing resources for wild animals at an alarming rate due to timber and firewood harvesting or extraction by the local communities. For instance, local communities are in direct competition with the bears for food resources in the protected areas of Madhya Pradesh. As a result, conflicts arise when bears enter the fields and consume valuable agricultural products (Rajpurohit & Krausmann, 2000).

Although very rare, these conflicts also unfold in the form of accidental killings of the humans. In most places, wild animals are wary of human beings and keep away from any form of encounters. In his book titled '*People and Wildlife: Conflict or Coexistence?*', Karanth (Woodroffe, Thirgood & Rabinowitz, 2015) wrote that "Accidental mauling or killing of humans by tigers is rare, and usually occurs when angry mobs surround tigers that enter human settlements to take livestock."

Over the years, BNP has been the backdrop for multiple tiger attacks and killings. In his memoir as a forester in BNP, R.C. Sharma wrote,

The spot from where the body was lifted had a small piece of *saari* of the ill-fated woman (victim to the man-eater's attack) and a stain of blood...and there was the determined Royal Bengal Tiger who budged not an inch, again a big growl and a wide-open mouth...in whole my service, then of 20 years, I had never seen such a sight (Sharma, 2008).

The infamous tigress of Bamera, a village situated in the core region of BNP, is said to have attacked livestock and human beings on several occasions (Naveen, 2014).

All of these factors have led to the aggravation of the human-wildlife conflicts. The resolution of these conflicts is essential to conservation. Local communities in and around Protected Areas will not participate in the conservation of wild animals until these conflicts are resolved (Rajpurohit & Krausmann, 2000).

### 2.1.2 Change in Landuse via GIS

Land Cover refers to the characteristics and elements found on the surface of our planet. It includes trees, lakes, vegetation, roads etc. Land Use refers to the activities that people perform on a piece of land (Sharma, 2015). Land use directly affects the land cover of an area (Midha, 2008). There are many economic, environmental, and sociological factors that affect the land use of a certain region. Tracking land use change can help in the future management of national parks. Changes in forest cover should be monitored as they directly affect the surrounding environment, wildlife and flora present in the region. Land Use and Land Cover Change (LULCC) can be determined by remote sensing and GIS.

Remote sensing is the science of acquiring information, in this case, images, about an area using a remotely controlled device, without the device coming in contact with the area (Sharma, 2015). GIS (Geographical Information System) allows us to capture, analyse and interpret the change in a particular area by providing geographic data for the same. Remote sensing and GIS work together to produce a final output in the form of a map. The map highlights different regions in different colours to show forests, lakes, roads etc. There are about fifteen different software applications that fall under the 'GIS' category. Out of these, ArcGIS, QGIS and GRASS GIS are the most effective applications used for mapping LULCC. Remote sensing is efficient as it does not take much time or cost and combined with GIS it gives us the right output for analysis of data (Agarwal et al., 2010). It helps in assessing and evaluating areas in the forest that are inaccessible and difficult to navigate (Alam, Khan, Pathak & Kumar, 2014). It is also useful in planning the utilisation of resources for the future (Midha, 2008).

Extensive research has been done in terms of mapping these changes in the national parks of India. The methodology used by researchers is different in every paper as it is based on the type of software they use and the topic of their research. In Jim Corbett National Park, remotely sensed GIS data showed that there had been an increase in the cover of dense forest. In her paper, '*Forest Change Analysis of Jim Corbett National Park, Uttarakhand: A Remote Sensing and GIS Approach*', Shivani Agarwal suggested that this could be due to better management plans of the forest department. There had also been an increase in built-up area, which may be a consequence of the increase in tourism over the years (Agarwal et al., 2010). In Chindoli National Park, GIS imagery showed an increase in the shrubland cover. This can be attributed to deforestation and overgrazing in the region (Imam, 2011). A LULCC mapping of BNP concluded that, with an area of just over 1500 square kilometres, there is lack of space for the tiger population to grow in the region (Zoological Survey of India, 2009). Similarly, GIS can help the forest department to study the area with a bird's eye view and take possible steps to resolve the problems that might occur in the near future. The literature review looks at the existing research and literature available on national parks around India. It focuses on the ecological, sociological and economic aspects of national parks. Also, the final section highlights the laws and evolution of policies surrounding national parks from the past nine decades.

## **2.2. Sociology**

Protected areas cannot be viewed in isolation from the human settlements that surround them. It is important to recognise the voices of different stakeholders to incorporate holistic conservation policies. Therefore, a sociological lens is needed to complete any narrative related to any conservation enclosure, in this case, Bandhavgarh National Park (BNP). The major social stakeholders in Bandhavgarh are the local communities and forest officials.

### **2.2.1 People-park Relationship**

In the last few years, major changes have taken place in conservation policies all over the world. There has been a steady rise in the number and size of protected areas in developing countries, notably national parks and wildlife sanctuaries. Although in some protected areas certain human interventions are allowed, local communities living in and around these areas face a systematic restriction of access to the forest resources (Dwivedi, 1997). Following colonial times, the primary objectives of the forest departments in India have been to limit

human interference in the parks' resources. This approach has generated stiff resistance from the communities living in the region. The Indian Government and aid agencies have devised a number of measures to accommodate the subsistence and natural resource requirements of the local communities. One such step was the creation of buffer zones between strictly protected areas and human settlements in the 1970s under UNESCO's 'Man and the Biosphere Programme'(Dwivedi, 1997). Their conservation policy has enjoyed support from a sizeable number of environmentalists located in urban areas. They believe that without state intervention, deforestation and wildlife depletion would increase at an alarming rate due to pressure exerted on forests by local communities on the one hand, and developmental projects on the other (Dwivedi, 1997). Sustained lobbying by the latter has led to stringent legislation such as the Wildlife Protection Act (1972 and 1991), the Forest Conservation Act (1980) and the Environment Protection Act (1986) (Dwivedi, 1997).

However, there is another thread of argument that encourages the role of indigenous people and local communities in the management of these Protected Areas (Sawhney, 2003). Especially in the realm of Indian academia, there has been growing interest regarding traditional and religious methods of conservation. For example, the Bishnoi and Bhil communities<sup>4</sup> in Rajasthan practice conservation as a part of their *dharmā*<sup>5</sup> and have given sacred status to natural elements in their environment through sacred groves<sup>6</sup> (Jain, 2001).

However, sacred groves grew fewer over the years and are being replaced by the western policy of conservation that eliminates the role of local communities. Hence, policies structured solely for wildlife conservation are often not mutually beneficial and bring harm to humans inhabiting these areas (Jain, 2001). Therefore, there has been a constant struggle between local communities and policymakers over the conservation approaches to management of protected areas.

### 2.2.2 Displacement of Local Communities

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<sup>4</sup> Desert dweller tribes of Rajasthan

<sup>5</sup> Religious duty

<sup>6</sup> Forest areas with special religious and cultural importance to a community



Displacement and relocation of local communities for the sake of conservation has been a topic of debate for more than three decades (Kabra, 2003). Many conservationists and ecologists feel that the displacement of local communities is essential for the conservation of wildlife. However, the opposition argues that it has detrimental impacts on the livelihoods of the communities that have held a stake in the forests for centuries (Kabra, 2003). Furthermore, it disrupts the balance that nature and humans have established over the last couple of centuries (Kabra, 2003).

In BNP, Bathan village in Tala region was the only village that was relocated until 2003 (Sawhney, 2003). The main reasons stated, for the displacement not being carried out in other villages, are the villager's unwillingness to move, insufficient funds for the process, a dearth of sites for relocation and a lack of political will (Sawhney, 2003).

While reviewing cases in Gir National Park, it was found that the local communities around the park were pushed into agricultural occupations during the relocation process and, therefore, were unable to cope with the drastic change (Lasgorceix & Kothari, 2009). Relocated communities have been promised land and money as compensation. However, there have been many instances of conflict regarding compensation between the policymakers and the locals. In many cases, infertile lands were given as compensation to the local communities. Moreover, the compensation policy is criticised for its unfair distribution of land and inadequate monetary compensation. In many cases, compensation in the form of land was given to the landless while villagers with large areas of land were given small areas as compensation (Lasgorceix & Kothari, 2009).

### 2.2.3 Social stratification

#### 2.2.3.1 Gender Roles

Gender in wildlife conservation is a scarcely researched topic, especially in the national parks of India. Even the most pro-community based conservationists are often indifferent to its relevance (Costanza, 2010). In most research, the opinions of women are either neglected or assumed to be the same as those of men since the head of the household, rarely a woman, is a common target for research (Allendorf & Allendorf, 2012).

Access to, and the use of forest resources, as well as attitudes towards conservation, are largely affected by the relationship between genders (Costanza, 2010). In a study of gender in conservation, women were found to be much less knowledgeable about protected areas than men (Allendorf & Allendorf, 2012). It is essential to address such disparities because the success of community-based wildlife conservation, to a large extent, depends on a keen understanding of local dynamics based on gender, caste, class and literacy. Gender in conservation can be used as an impactful tool in changing negative gender stereotypes and empowering sustainable activities that have been traditionally carried out by women (Allendorf & Allendorf, 2012).

Several reasons for the scarcity of views on gender and wildlife conservation were identified: a dearth of empirical research about gender issues and wildlife, lack of training opportunities, ambiguities about the concept of gender itself, and lack of adequate platforms to discuss the role of gender in conservation (Ogra, 2012)

## **2.3 Economics**

Forest areas and natural resources have always been a rich source of income for the human population. Although economic practices are limited in Protected Areas, many livelihood practices of the local communities are based on natural resources procured from their surroundings. Hence, economic practices have to strike a balance between conservation and well-being of the local community.

### **2.3.1 Ecotourism**

Tourism is the second largest net foreign exchange earner in India and gives rise to a large number of employment opportunities (Joshi, 2017). The defining characteristic of ecotourism that it is environmentally sustainable while ensuring appropriate returns to the local communities. The involvement of local communities is very crucial in ecotourism to ensure long-term sustainability. Ecotourism is a significant source of livelihood in Madhya Pradesh aiding in the conservation of forest lands by encouraging the non-consumptive use of wildlife while generating valuable income for the communities (Joshi, 2017). In his paper on ecotourism, Indian economist, Abhijit Banerjee made policy recommendations to improve ecotourism, such as setting up an eco-tourism committee for each protected area, and an

increment park entrance fees which would contribute to the conservation of wildlife, park management, ecotourism operations, and community development projects (Banerjee, 2010).

### 2.3.2 Non-Timber Forest Products

Non-Timber Forest products have recently come into light after the ban on timber extraction in various protected areas. This ban was a part-result of the Forest Conservation Act, 1980. The act promotes afforestation, the imposition of a heavy duty on Timber Exports, and a ban on timber extraction in certain states.

NTFPs are a major source of income for the forest dwellers. However, the primary collectors still receive meager returns from NTFPs. They are exploited by the traders and the middlemen as they exploit and reap the majority of profits (Rasul et al., 2008). Furthermore, the law only provides trade licenses to the middlemen and not to the primary collectors, creating further discrepancies. Lastly, the local communities are not allowed to add value to the primary collection since they must sell the harvested product in its basic form, therefore reaping minimal income from the process (Rasul et al., 2008).

A question of the sustainability of forests versus the sustainability of local communities is posed since, in most cases the collectors resort to over-harvesting and exploitation of resources when they do not get enough income from the prescribed amounts of harvests (Ticktin, 2004).

## 2.4 Evolution of Laws and Policies

Post-independence, several Wildlife & Forest Acts were passed which aimed at protecting the forests. These policies had several provisions for strict protection, but they have been criticised on many grounds. One primary issue lies in focus on 'Protection' rather than 'Conservation'. Many critics believe that the development of local communities should be a part of the conservation process.

Moreover, there is common criticism regarding the absence of a constant dialogue between all the stakeholders. The joint responsibility of all the stakeholders is also amiss in the current

laws and policies. As a result, there has been a constant conflict between forest officials and the local communities. Involvement of the communities in the conservation process is a possible solution to this conflict (Singhar, 2002).

The forest policies in India can be categorised into three main phases based on their approach to conservation:

Pre 1970 :

- Indian Forest Act 1927
- National Forest Policy 1952

This period shows the realisation of the importance of conservation because the concept of 'Protected Areas' was introduced in National Forest Policy of 1952. While the focus of the Indian Forest Act 1927 was on consolidation of the existing forest policies, the National Forest Policy was more specific and emphasised on striking a balance between the social, economic and ecological benefits of the forest (Bhat, 2010).

1970-2000:

- Wildlife (Protection) Act, 1972
- Forest Conservation Act, 1980
- Amendment - Forest Conservation Act, 1988
- National Forest Policy, 1988
- Joint Forest Management, 1990

Conservation efforts became more rigorous post-1970. The conservation laws became more focused than before, and the Wildlife Protection Act was introduced in 1972 to preserve and protect wildlife exclusively. Although there was an emphasis on meeting industrial demands for forest produce, wildlife conservation was prioritised above all. Moreover, with the introduction of National Forest Policy and the Joint Forest Management after the 1980's, community participation was given equal importance. Need to involve local communities in conservation and management of forests was growing because of the importance of people's participation in management. (Bhat & Sairam, 2010)

2000 onwards:

- Amendment - Wildlife (Protection) Act, 2002
- National Wildlife Action Plan, 2002
- Biodiversity Act, 2002
- State/ Union Territory Minor Forest Produce (ownership of Forest Dependent Communities) Act, 2005
- Scheduled Tribes and Other Forest Dwellers (Recognition of Forest Rights) Act, 2006
- Amendment - Wildlife (Protection) Act, 2006

During this period, tribal communities were given rights over the access to forest resources under the Scheduled Tribes Act, 2006. This was a major shift from the earlier models of conservation as their entry in the protected areas was made flexible. Additionally, the concept of NTFPs was also introduced in the Minor Forest Produce Act of 2005. There was a shift to the use of forest resources for economic purposes that provide for the conservation of wildlife too. (Bhat & Sairam, 2010).

There are constant debates on whether the focus of policy should be to grant rights to forest dwellers or protect wildlife exclusively. For example, the Scheduled Tribes Bill of 2005 was introduced to grant certain rights over the forest resources to forests dwellers. However, these rights allow access to resources in the protected areas which is in direct contention with the wildlife centric idea of conservation (Madhusudan, 2005). Wildlife and forest-dwellers have become pawns in the hands of the government as several policies have resulted in a constant turmoil between the various stakeholders involved. The laws have placed more emphasis on conservation of forests, while people are being asked to relocate from their native places. (Sudharaman, 2016).

## **2.5 Gaps found in the available literature**

While surveying the existing literature, it was evident that BNP had not been researched upon as much as other national parks around the country. Land use and vegetation cover are the only GIS projects that have been in BNP. Forest cover of BNP has not been looked into, and the GIS mapping for the same was last done in the year 2000.

Moreover, a plethora of research done on national parks in India tends to study the local community in a homogenous manner. Aspects like differences in caste, gender and literacy rate of people have not been considered. The local communities living in and around the park are considered as a homogenous community; they're looked upon as a single entity. While studying national parks, caste has not been taken into account as a factor that affects the functioning of the park and local communities around it. The effects of gender in this regard are underrepresented as well.

The functioning of the forest department, a major stakeholder of any national park, and their internal hierarchy and distribution of responsibilities have not been elaborated upon. The only dimension where the forest department was considered is with regards to relocation and relationship with the local communities. Everyday exchange of forest department with wild animals is also a form of human-wildlife interaction. Many of the employees of the forest department have to be on-field with the animals while patrolling. The hurdles that they face and concerns about safety have not been considered.

Apart from the dissertation by Puja Sawhney, written in 2003, there has been no academic research on the relationship between the local communities and forest department with specific reference to BNP. Ecotourism is relatively a new concept in Madhya Pradesh, with its advent only in the year 2005 (Madhya Pradesh Ecotourism Development Board, n.d). Madhya Pradesh is the home to nine national parks (Forest Department, Madhya Pradesh, n.d). The effect of ecotourism on the local communities has not been explored. The change in the relationship between the forest department and the local communities after the introduction of ecotourism in BNP has not been studied either.

# Through the Lens of Ecology



## 3.0 Through the Lens of Ecology

### 3.1 Introduction

Conservation of wild animals has been practised for centuries in India. Even before the concept of protected areas was formulated, communities protected wild animals in their ways. For example, pregnant females and young animals were not allowed to be hunted (Pathak & Kothari, 1998). Moreover, hunting of certain animals was seasonal to ensure the preservation of their species. However, colonized India saw an enormous exploitation of its flora and fauna (Pathak & Kothari, 1998). As a result, the population of wild animals reduced significantly. In an attempt to regain India's rich biodiversity, the Wildlife Protection Act of 1972 was enacted post-independence establishing various national parks and wildlife sanctuaries around the country. Another milestone in the history of wildlife conservation in India is Project Tiger. It was launched by the Government of India in the year 1973 after the fast dwindling population of tigers came to their notice. It is supervised by the National Tiger Conservation Authority (NTCA). The NTCA is designed to increase the population of tigers and their in-situ conservation<sup>7</sup> (National Tiger Conservation Authority [NTCA], n.d). One of its primary objectives is to focus on the interests of the local communities that live around tiger reserves (NTCA, n.d). The project has been successful in increasing the population of tigers in India. Presently, there are fifty tiger reserves under Project Tiger, and BNP is one of them.

#### 3.1.1 Why save the tiger?

The field director of BNP discussed the need to conserve tigers in the wild. He stated that tigers are the 'umbrella species' for conservation. Umbrella species are "species whose conservation confers a protective umbrella to numerous co-occurring species, offering an appealing shortcut [in conservation]" (Fleishman, Murphy & Brussard, 2000 ). He argued that the survival of the tiger is essential for the continuation of humankind. Tigers host the Salmonella bacteria inside their stomach which helps them in the digestion of meat. If tigers were to go extinct, the bacteria would lose its primary host<sup>8</sup>. Consequently, it would move on to another host, called an alternate host. Since human beings are the most susceptible alternate hosts for it (high

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<sup>7</sup> Technique of protecting an endangered species of plants and animals in its natural surroundings

<sup>8</sup> A plant or an animal which shelters a parasite in its body



population and large body mass), the Salmonella bacteria would make humans its alternate host<sup>9</sup>. This could lead to the spread of a calamitous epidemic amongst humankind. For example, bird flu, an illness that affects human beings, has originated from animals.

The Tiger is the representative species of BNP. It helps create awareness about the conservation of all species of the park. Furthermore, it also acts as an umbrella species by generating revenue from ecotourism. BNP attracts thousands of tourists who visit the park for the sole purpose of tiger sightings. The revenue, thus generated, helps in the conservation of the flora, fauna and local communities of the park.



**Image 2: T-37, the tigress of Magadhi Range**

Source: Discover India Program, 2017 - 2018

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<sup>9</sup> A plant or an animal, other than the primary host, that is capable of catering the parasite

### 3.1.2 Threats to the tiger

Habitat loss and human-wildlife conflict have rendered wild tigers vulnerable to extinction. Tigers, being solitary animals, have vast territories of their own. Infrastructural development has led to the fragmentation of their habitat. Habitat fragmentation is the process of breaking the continuous wildlife area of habitat due to developmental activities resulting in secluded patches of land (Van De Berg, Bullock, Clarke, Langston & Rose, 2001 ). This impacts their breeding process as they are unable to find suitable mates. Also, the mortality rate among tiger cubs is very high as half of them die in the first two years of their birth (WWF, n.d).

Human-wildlife conflict in and around the park is another issue that hinders the tiger conservation. The field director of BNP narrated an incident from the village of Gata in Bandhavgarh where a woman collecting *Tendu Patta* (NTFP) in the forest was attacked by a tiger. Forest officials arrived to take care of the affair. Despite warnings from the officials, another man entered the forest area where the tiger had attacked the woman. The same tiger attacked and killed the man. These incidents enraged the local communities and made them retaliate violently. In the Manpur village of Bandhavgarh, roughly 10,000 villagers armed with spears and knives entered the forest to kill a notorious tiger in retribution; the department had to intervene to curb the situation. The officials of BNP emphasised that as long as tigers and humans occupy the same area, the human-wildlife conflict will continue to cause problems.

“The survival of the two [human beings and tigers] is parallel. We need to create a balance between the two... No life is more valuable than the other. If a human life has value then the tiger's life has value too,” he concluded.

### 3.2 Human- Wildlife Conflict

Conflicts between local communities and wildlife in and around the park lie at the core of people-park relationships in BNP and raise serious questions about their coexistence.

<b>Table 1 Wildlife Population Estimation Data 1997-2004</b>								
Species	1997	1998	1999	2000	2001	2002	2003	2004
Tiger	52	52	56	56	64	66	66	67
Panther	36	33	43	43	48	59	60	55
Chital	7473	11300	8931	16343	22450	-	13198	13474
Sambar	812	1700	2291	2267	8444	-	4168	4259
Neelgai	671	2300	2165	2912	5692	-	4654	4298
Chinkara	183	620	427	1140	2363	-	1945	1972
Barking Deer	200	480	405	783	576	-	694	655
Chousingha	19	30	3	5	14	-	Rare	17
Wild pig	1861	4500	5168	6351	4900	-	2528	4293
Wild dog	9	21	24	29	144	-	65	64

Source: BTR Management Plan 2006

Table 1 shows the wildlife population estimate from the years 1997 to 2004. The population of wild animals has increased considerably over the years. Bandhavgarh has been successful in conserving and increasing its tiger population significantly.

Local communities:

With the wildlife population, including tigers, of the park highest in the past few decades, the local communities are at a constant risk and are very vulnerable (Chart 2). Respondents were asked about their living conditions in such proximity to the park, a respondent lamented about the lack of facilities around the area and said:

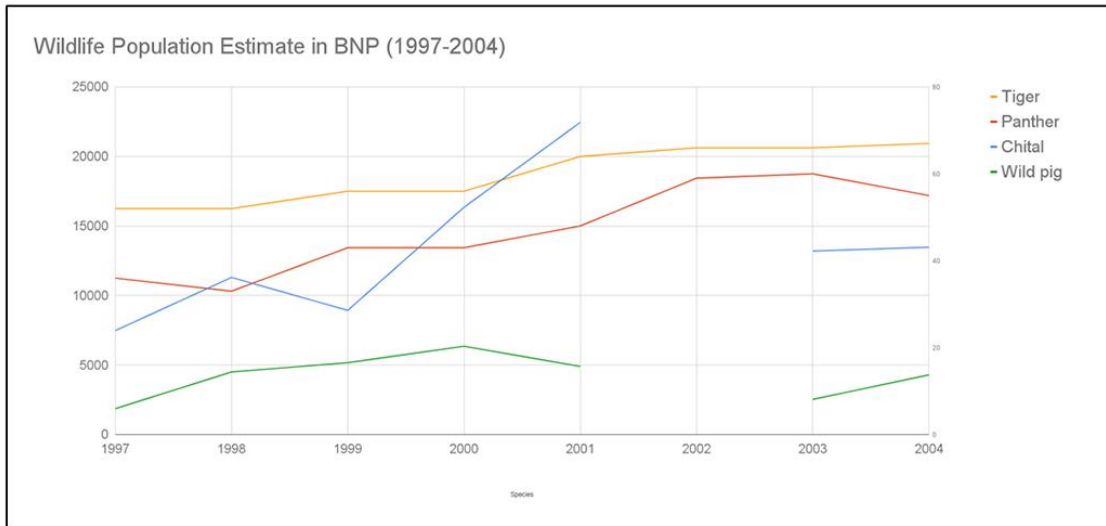
“What other option do we have [if not Bandhavgarh]? Where else will we go? There is nothing here... We cannot even go anywhere since we are living right inside the jungle”-

(P019)<sup>10</sup>

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<sup>10</sup> Participant codes from the primary research

**Chart 2**

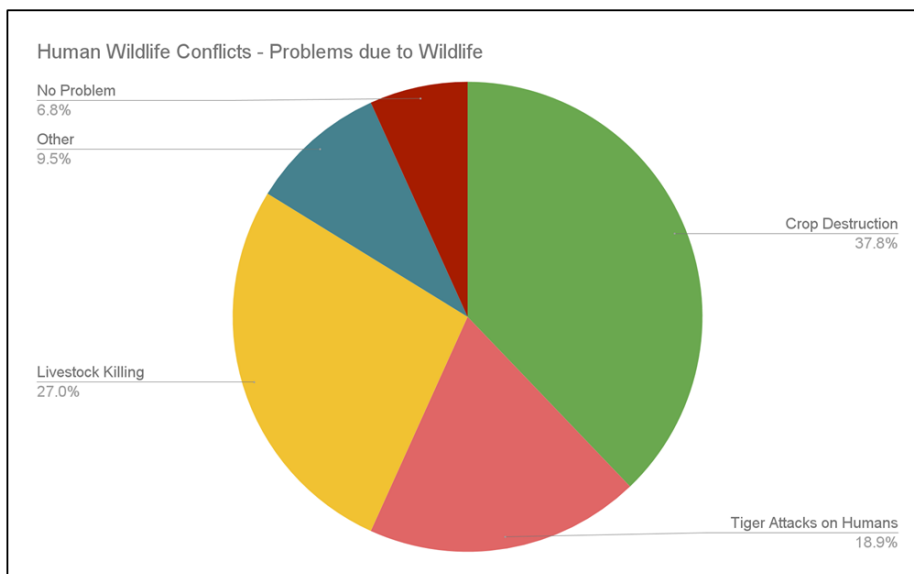


Source: BTR Management Plan 2006

Data Analysis:

*What problems do you face due to your proximity to the wild animals?*

**Chart 3**



Source: Primary Data

The collected primary data showed that crop destruction, livestock killing and attacks on human beings were the three main causes of Human-wildlife conflict in the region.

#### Crop destruction:

Crop destruction was the main problem that the local communities faced due to wild animals. 37.83% of the respondents (n=74) referred to crop destruction as the biggest issue. Wild pigs were reported as the most notorious animals for destroying crops. The system of fencing does not help in this case as wild pigs dig under the fences and enter the farms. Many respondents expressed their concerns about corruption in the forest department. The department was accused of not using the complete budget allotted to them for installing fences.

Apart from wild pigs, other animals such as chital, tigers, monkeys, deer, and boars were also responsible for crop destruction. Villagers reported that they have to spend their nights on *machaans* to protect their fields from wild pigs and other animals. The respondents expressed their grievances:

“The wild pigs destroy all our crops. No matter what we grow, they spoil everything.”- (P057)

“Wild animals destroy our crops. There is no future for us in this village.” - (P070)

#### Discussion:

Throughout the primary research, this was the most prominent issue faced by the local communities. This has reduced their family consumption and income to a large extent. The fencing around the park has reduced the movement of wild animals into the villages. However, it can reduce attacks on cattle, and curb crop damage only to a certain extent. It must be noted that some of the fences are rusted which reduces their usability.



**Image 3: A farmer from the village of Garhpuri on his *machaan***

Source: Discover India Program, 2017 - 2018

Livestock killing:

27.02% of the respondents referred to livestock killing as a challenge faced due to wild animals. Majority of these respondents accused tigers of livestock predation. This led had to resentment among local communities towards tigers:

“The government has diverted all its attention towards the tigers and the park. If a tiger is sick, they will send for help in no time. But if a person is sick, nobody will ever come for help.”

- (P024)

“We don’t like tiger because it kills our livestock and I want to kill it.” - (FGD Ranchha)

However, not all respondents held grievances against tigers, as some of them were aware of the importance of their coexistence. Their responses were:

“We take care of the animals here. We don’t let anyone enter and attack them. Yes, the tigers do attack our cattle but that is a part of life and we have to live with it.”-(P021)

“The tiger ate my calf because it was its prey and that’s how the food chain works.”-(P024)

Table 9 (appendix) shows the cattle kills by wild animals from 2000-2004 in the five ranges of BNP. The Panpatha range had the highest number cattle kills during this period, with a total of 150 kills.

#### Discussion:

Majority of tiger attacks on livestock take place when cattle enter the forest for grazing. In some cases, tigers enter villages to prey on livestock. Hunting of livestock is much easier than hunting of wild animals for tigers as cattle are available in abundance in the region. This, once again agitates the local communities as their livestock adds to their income. However, some of the local communities are aware of the habits of the wild animals and have learned to live it and accept it as a part of the food chain.

#### Attacks on Human Beings:

Tiger attacks on human beings were the third most common problem that led to a conflict between the two. 18.9% of the respondents reported tiger attacks as an issue. There were many reports from the respondents of tiger attacks on people collecting NTFP's from the forest.

Table 8 (appendix) shows the human injuries/kill due to wild animals. The highest number of human attacks has taken place in Panpatha sanctuary.

#### Discussion:

Most of the tiger attacks on human beings take place at the time of NTFP collection. Although the local communities were aware of the danger associated with entering the tiger habitat, villagers continued to do so, as NTFP collection is an important source of livelihood for many.

The field director discussed the issues of human-wildlife conflict management in BNP. Over the past three years, 14 people per year were killed by wildlife.

A large number of cattle near Garhpuri, Ranchha, Gori, Bamera attracted tigers to these villages. These tigers also attacked people in the process of hunting cattle. Cattle and humans were easier to prey on as compared to herbivores in the forest. As a result, the human-wildlife

conflict was at its peak in 2014. Consequently, the people of BNP got extremely agitated and started to burn down residences of forest officials.

The forest department, along with the local communities decided to find a solution for this issue. The solution was to perform a ritual called *Akhanda Ramanya*<sup>11</sup>, where for seventy-two hours the villagers had to beat drums as a part of the ritual. The sound of the drums resembled gunshots, and so, the tigers slowly moved to the Core area which was away from the villages. The field director reported that there have been no tiger casualties in BNP since then.

Compensation: If an attack on a human being is reported to the Forest Department, the range officers must first investigate the situation before paying the full compensation. According to the Madhya Pradesh Forest Department, the compensation paid to the successor of a person who is killed by a tiger is INR 1,00,000. They also pay for medical treatment and pay INR 20,000 to treat the injured person. If a person incurs a permanent damage leading to disability, INR 75,000 is the amount paid to the injured person (Madhya Pradesh Forest Department, n.d). When asked one of the respondents if this amount of compensation is enough, he responded by saying:

“ No compensation is enough compared to human’s life.”-(P010)

Primary data showcases that 56% of the respondents (number of respondents= 50) got compensation for the attacks by wild animals, either for cattle kills or human attacks. The compensation amount paid for cattle was very varied, ranging from INR 2,000 to INR 15,000. Additionally, for human deaths, the compensation amount ranged from INR 1,00,000 to INR 4,00,000. However, 42% of the respondents reported that they did not get any compensation. Compensation for crop destruction was not provided to almost all respondents. This added to the losses incurred by the local communities since crop destruction was the biggest and most frequent problem they faced. Moreover, 2% of the respondents did not have any knowledge regarding the compensation rules and procedures.

Compensation for problems caused by wildlife is a tedious process which involves a lot of documentation and paperwork from the villager’s side. One of the respondents also mentioned that, since many villagers are illiterate, it is not possible for them to complete the government

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<sup>11</sup> Continuous recitation of the complete *Ramayana*



procedures which involves tedious paperwork. As a result, the villagers received no form of compensation.

**Forest department:**

The forest department was asked questions regarding their interactions with the wild animals:

Data Analysis:

*What problems do you face working in such proximity to wild animals?*

Safety: While interviewing employees of the forest department, they were asked questions about their everyday routine and problems on the field. The primary concern for the forest guards was safety. One of the respondents who was a Forest Guard spoke about the problems he faced when they patrol on a cycle:

“Sometimes they [tigers] charge or come near when you go inside the jungle on the cycle. When you live in the jungle there are no lights (electricity). These are the main problems.”-  
(F009)

The forest guards on the field have patrolling duties various times of the day, and they do not have any weapons to protect themselves. They either have a small iron rod with an extended wooden stick or nothing more than their own hands. Another respondent, a Guard of Tala Range, complained that:

“At four o’clock in the night I have to go into the core zone of the forest. At this time, the tigers, cheetahs and bears could easily eat me and no one would even get to know. Only if someone doesn’t return for hours is help sent, it is usually too late by then.”-(F008)



**Image 4: A fence separating the village of Garhpuri from the core area of BNP**

Source: Discover India Program, 2017 - 2018

#### Discussion:

From the primary data that was collected, it is evident that the Forest Department does not give its employees sufficient tools to protect themselves from the wild animals. Being on-field in a tiger reserve is dangerous, especially when the natural light is limited and the animals are prone to mistake human beings for their natural prey. Every time a guard is on duty, they are at constant risk of being prey to wild animals.

#### Data Analysis:

*Have there been any recent instances of poaching?*

The forest officials were asked questions about cases of poaching over the last decade in BNP, all of them, except one forest guard, said that there had been no cases of poaching in BNP over a decade. That one forest guard mentioned that sometimes local communities do harm the animals, he said:

“They [local communities] put a rope around their necks and choke the animals. Sometimes they get their pet dogs to attack them.”- (F008)

Table 10 (appendix) shows that there hasn't been any official poaching in BNP with regards to tigers and leopards. However, there have been poaching of Sambar, Chital, Langur and Porcupine in the time-period mentioned above, but this number is not very significant.

Discussion:

The fact that there have been no reported cases of poaching over the last couple of years shows the efficiency of the park in conserving and protecting the wild animals. However, there is a possibility of some cases of poaching going unreported, as the forest guard mentioned above.

Conclusion:

The main concerns that local communities face due to wildlife is crop destruction, livestock killing, and attacks on human beings. Dangers resulting from proximity to wild animals is of grave concern to both local communities and forest guards. The trespassing of habitats and settlements by local communities as well as wild animals, respectively, leads to many attacks in and around the BNP region.

### **3.3 Land Use and Land Cover Change (LULCC)**

The primary objective of this section is to map the land use/ landcover pattern of Bandhavgarh National Park, Madhya Pradesh, India with the help of Grass GIS.

GIS helps in mapping the changes in forest cover and land use which in turn could explain factors like population growth, urbanisation, deforestation, and afforestation.

GIS enables in visualising, questioning, analysing, and interpreting data to understand relationships, patterns, and trends in the forest and land surrounding it. Change in water bodies can also be observed via GIS.

<b>Approximate Date range</b>	<b>Landsat</b>	<b>Landsat Imagery</b>	<b>Path</b>	<b>Row</b>	<b>Date of Acquisition</b>
<b>1994</b>	Landsat 4-5	Thematic Mapper	143	44	16th November
<b>2017</b>	Landsat 8	Thematic Mapper	143	44	17th October

Source: United States Geological Survey website

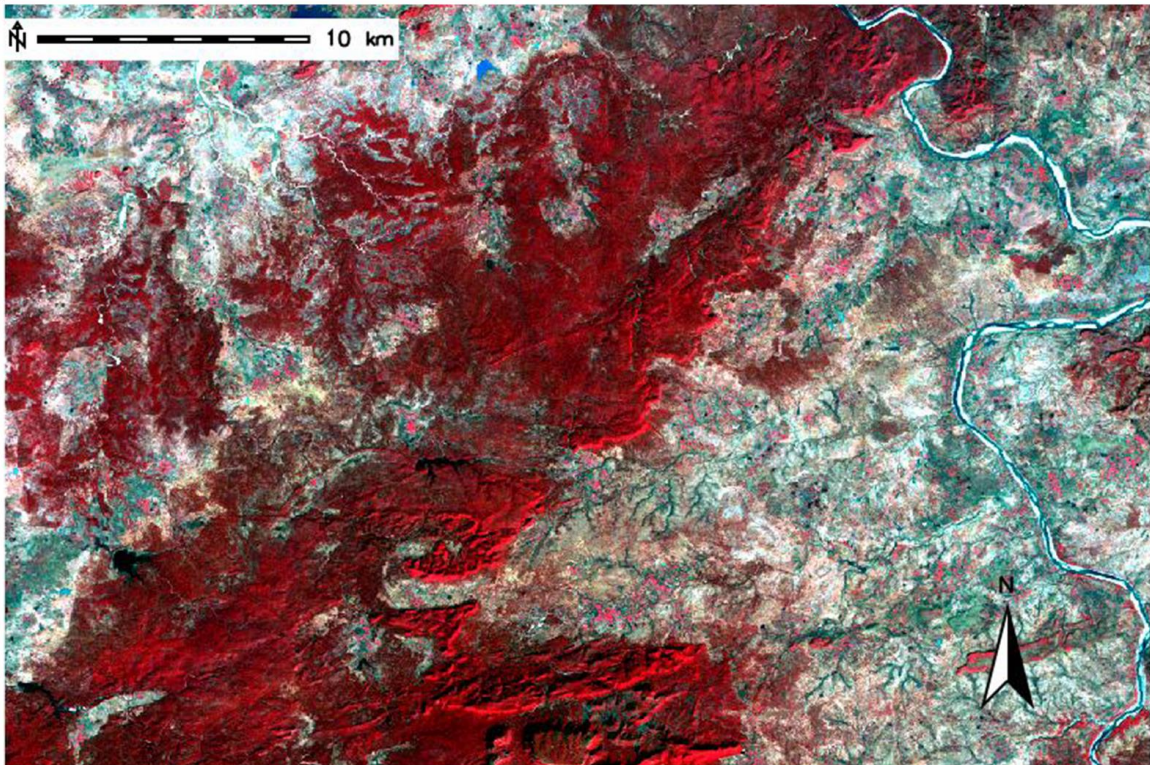
The data collected was imported in Grass GIS, and its colour was enhanced by using RGB colour scheme. A study Area of Interest (AOI) was built around the Bandhavgarh National Park boundary and co-registered with sub-pixel accuracy for accurate estimation of areas.

Results:

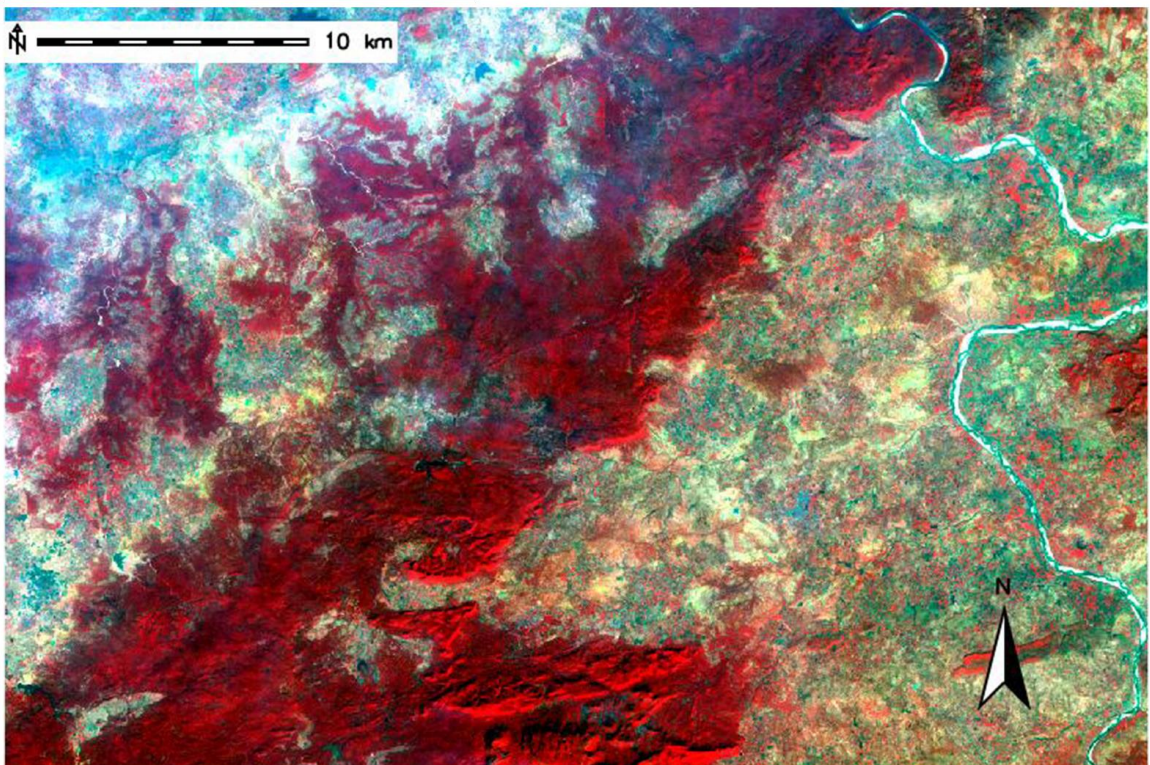
<b>COLOUR</b>	<b>INDICATION</b>
Dark Red	Dense forest cover
Light red-purple	Light forest cover
Green	Urbanisation
Light Yellow	Barren land
Black	Water bodies
White	Son River/Boundaries of water bodies



**Chart 4 Enhanced GIS Map - 1994**



**Chart 5 Enhanced GIS Map - 2017**



Data Analysis:

The picture on the left shows GIS RGB enhanced map sets of Bandhavgarh National park from November 1994 and the one on the right shows data acquired from November 2017. There is a gap of 23 years between the data sets which makes it possible for comparing the change in forest cover using GIS.

Discussion:

When compared, the maps show evident changes in the forest cover. The forest cover has reduced in certain regions due to increasing urbanisation and development. However, there has been reforestation in barren land which has led to growth in patches throughout the area. Changes in forest cover could potentially lead to a gradual change in flora and fauna of the region (Sharma, 2010). Hence, it is essential to maintain forest cover of BNP. There is also an evident increase in urbanisation around the park, and this could be because of the construction of new houses, roads or buildings. Increase in ecotourism that resulted in the new resorts and restaurants in BNP has also led to increased urbanization.

Conclusion: The change in forest cover of BNP is interesting as there has been a mix of both afforestation and deforestation in different areas. The cause of change in forest cover in BNP seems to be urbanization. Change in forest cover can affect the flora, fauna and abiotic factors of a region drastically over a span of a couple of years.

### **3.4 Change in BNP Over the Years**

The interviews conducted with the local communities in and around the park gave an insight into the change in BNP over the years and the attitudes of the communities towards these changes.

Data Analysis:

*How has life in BNP changed over the years and how do you feel about these changes?*

There were two main aspects where the villagers found a major change over the years with regards to Bandhavgarh becoming a National Park:

#### Changes related to Biodiversity:

The number of animals in the forest has increased overall. This can be seen as a success of conservation in the form of preserving and protecting the population of wild animals. Nevertheless, the increase in crop damage, livestock killings and attacks on humans because of this increase cannot be avoided.

There have been mixed responses concerning the change in forest cover. Some of the respondents spoke about a reduction in the number of trees whereas some of them spoke about the increase in the forest cover.

#### Changes impacting the Local Communities:

Development: The respondents explained that there had been more access to electricity, hand pumps and washrooms. Construction of wells helped the farmers with irrigation. Eco samithis<sup>12</sup> and government schemes have also helped to create better facilities for many villages in and around the park. However, some villages still remain deprived of these facilities.

The respondents from the village Garhpuri and Bamera, villages located in the core, were the most vocal about their frustration about not having access to electricity. Moreover, the muddy paths cause disturbances to the villagers when it comes to commuting in the village Bamera. Respondents from this village also spoke about rains causing difficulties in moving a sick person to the doctor located outside the core.

#### Employment:

The park becoming a major tourist spot has led to more employment opportunities for the local communities. The most common jobs arising from ecotourism are driving and serving in lodges.

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<sup>12</sup> A committee of small communities formed for the upliftment of the village



### Restrictions on entering the Park:

Results show that many respondents were unhappy with the fact that they cannot enter the park. According to the respondents, restrictions from entering the park as being the major change that has happened over the years. As BNP is a protected area, people are not allowed to enter the park to collect NTFP's or fuel food. The local communities are also not allowed to bring their cattle for grazing inside the forest. This, however, is done to protect the local communities from wildlife attacks.

### Data Analysis:

According to the primary data, only 45% (n=22) of the total respondents had a positive response towards the changes in BNP. 50% of the total men were happy about the changes whereas only 33% of the total women had a positive reaction to change. However, there is no significant difference between the responses of the two genders (p=0.484).

50% of literate people and 57% of the illiterate people were happy about the changes in the park. Additionally, 80% respondents of Scheduled Tribe (ST) were positive towards change. However, only 25% respondents of the General category (GC) were happy with the changes in the park. Lastly, 42% of Other Backward Castes (OBC) respondents were positive towards the shift.

	<b>Respondent Type</b>	<b>Positive</b>	<b>Negative</b>	<b>Significance Value</b>
<b>Total Groups</b>	All respondents (n=22)	45% (10)	55% (12)	-
<b>Gender</b>	Male (n=16)	50% (8)	50% (8)	0.484
	Female (n=6)	33.33% (2)	66.67% (4)	
<b>Literacy</b>	Literate (n=10)	50% (5)	50% (5)	0.771
	Illiterate (n=7)	57.14%(4)	42.86% (3)	
<b>Caste</b>	ST (n=5)	80% (4)	20% (1)	0.229
	OBC (n=7)	42.85% (3)	57.15% (4)	
	General (n=4)	0.25% (1)	0.75% (3)	
<b>Sub groups significant at p=0.05 level</b>				

Source: Primary Data



## Discussion:

Overall only 45% of the sample felt positively about these changes (refer table 3). This could be because of the restrictions that have been implemented to incorporate these changes. This restriction reduces their access to forest produce for their livelihood and fodder for their cattle. The villagers probably felt left out from the forest, which they consider as their home. In addition to that, there is also a constant fear of getting caught by the forest department in the forests which leads to increased negativity about the recent changes in and around the park.

But the acceptance towards this change could also be due to the new amenities that forests in buffer region are getting. This included access to good roads, electricity, and education. However, some villages like Bamera and Garhpuri, which are in the core region, do not have access to all these facilities. This is because installation of transformers is not allowed in the core area, as it could harm the wild animals.

### *Gender*

Although the difference between the attitude of change towards the park is not statistically significant, the change in opinion could be because men have gotten more employment opportunities due to the establishments of eco-development committees and tourism. Women traditionally collect more NTFP's compared to men. Hence, this restriction imposed on them could be the reason why women do not have a positive attitude towards the change.

### *Caste*

There were reports of the General Caste being unhappy with the fact that only ST's and OBC's were getting most of the employment opportunities. This could be the prime reason for the difference between the attitudes of people belonging to ST's and General Castes.

### *Literacy*

Similarly, illiterate people are slightly more positive towards these changes than literate people due to the employment opportunities they are getting, and the new facilities that are coming about in and around the park.

## Conclusion:

Other than forest cover, there are many more changes happening in and around BNP like availability of basic amenities, employment opportunities, restrictions and regulations. While the availability of employment and development in terms of wells, electricity, and education opportunities has made the local communities more positive towards these changes, there are many more who are not happy with these changes. Many have a negative attitude towards these changes because of the restrictions to enter the park. These developments have their pros and cons, but the majority of the local communities are still nostalgic about their old home.

# Through the Lens of Sociology



## **4.0 Through the Lens of Sociology**

### **4.1 Introduction**

The establishment of national parks alters the lives of people living in and around them. Hence, biodiversity conservation cannot be divorced from wider socio-economic and cultural issues. The two major social stakeholders in BNP are the local communities and the forest department. Local communities are concerned with short-term development goals, while forest department's major aim is long-term biodiversity conservation. The contrasting goals of the two major social stakeholders of BNP hence result in the formation of a complex relationship.

### **4.2 People Park Relationship**

Change in total area

Since the inception of BNP, the total area under management of the Reserve has grown at a steady rate. According to the Madhya Pradesh National Park Act 1955, 105 sq. km. of Tala Reserved Forest was unified under the name of Bandhavgarh National Park in 1968. With increasing wildlife, the State added 343.84 sq. km. from adjacent areas in 1982. In 1983, Madhya Pradesh government then declared 245.842 sq.km. of the area as Panpatha Wildlife Sanctuary, creating the northern boundary of the National Park. In 1995, all this area collectively came under the unified management of Bandhavgarh Tiger Reserve (Prakasam,2006).

Later, the Ministry of Environment and Forests accorded an area of 1161.471 sq. km, the status of "Tiger Reserve", including both Buffer and Core areas under this bracket. Subsequently, the Government of India instructed the state to notify Bandhavgarh National Park and Panpatha Wildlife Sanctuary. Under the settlement of rights procedure, a notification signifies the government's intention to label a specific area as a Protected Area. People residing in this area are required to file claims over land within two months after the issuance of the notification. As instructed by the notification, the buffer area would then be brought under the unified management of the Reserve. However, presently only 694.684 sq. km. of Bandhavgarh

National Park and Panpatha Wildlife Sanctuary is under the Reserve's control (Sawhney, 2003).

In the Park's extended area, there are three Forest Villages and three Revenue Villages. Currently, the process of settlement of rights is underway for eleven revenue villages. Proposals to relocate five villages have been drafted as villagers have recently consented to the move (Prakasam, 2006).

### Relocation Policy

The management of Protected Areas in India is based on the western concept of conservation that involves centralised training of bureaucracies and no role of local communities in conservation. Therefore, human habitation is severely restricted within protected areas. Several million people live inside or adjacent to protected areas whose livelihoods depend on the PA. However, there are a variety of issues that they face such as lack of essential amenities (e.g. healthcare, education, transportation etc.), conflicts with the wildlife due to crop/ livestock damage and attacks on humans. Due to these reasons, the local communities live in a constant state of deprivation and conflict with the forest department which holds these people responsible for the loss of wildlife. Thus often relocation is seen as the sole solution to all these issues (Kothari, 2009).

There are several national and state policies related to the relocation of local communities in protected areas. One such law is the Wildlife (Protection) Act of 1972 which limits the rights of people to live in protected areas. It also puts restrictions on the collection of natural resources and establishes a centralised management of the PAs. The Forest Rights Act (Rights of Scheduled Tribes and other traditional Forest-dwellers) of 2006 provides rights to people in protected areas which can be modified or extinguished and people can be relocated by taking their consent. In the year 2000, a judicial order was passed by the Supreme Court which restrained all the state governments from ordering the cutting of timber, grasses etc. in protected areas. This order was interpreted as a barrier to all rights and hence had a severe impact on the livelihoods of the local communities. It also led to forced and induced

displacement from within the protected areas. One significant development in the relocation legislation was the National Policy on Resettlement and Rehabilitation (2007). This was a centrally sponsored scheme made for protected area related relocation, and it specified that all relocations from protected areas should be “voluntary” and should conform to the provision of this policy. The compensations for relocation are provided by the Ministry of Environment and Forest (MOEF) through centrally sponsored beneficiary schemes. Currently, INR 10 lakh is offered as compensation according to the provisions of the 11th Five-Year-Plan (Kothari, 2009).

### Buffer Zone

Most villages lie in the buffer zone. The concept of a buffer zone emanated from the Project Tiger conservation philosophy. The principle behind this innovation was to keep the core area free of exploitation and use the buffer belt as an insulation belt against human use. However, since the late eighties, the focus has moved to managing the buffer zone as a multiple use area. A multiple use area then aims to conserve the Protected Area by eliciting public support. An ideal system of buffer zone management aims at addressing the welfare of the people as well as the Park (Prakasam, 2006).

### Local Community and Conservation

In BNP, local inhabitants have been divorced from mainstream development, and are dependent on the wilderness for social and economic needs. The BNP management has come up with Eco-Development programs to combat the problems faced by the inhabitants. Fifty-two Eco Development Committees (EDCs) have been constituted with 43 micro plans drafted according to Participatory Rural Appraisal. The eco development efforts focus on several aspects; off-farm income generation activities, skill development inputs, agricultural development, resource substitution and incentives for community cooperation (Prakasam, 2006).

Though these steps move towards a model of comprehensible conservation, in reality, there is bound to be competition and conflict over resource use in such a confined area. The conflict is a constant presence in the relationship between the local communities and the forest department who are the two major stakeholders in the management of the Reserve. Most indigenous people are concerned with short-term issues such as meeting the demand for fuel, fodder, NTFP and the availability of fertile land needed for agriculture. Forest Department, on the other hand, is primarily concerned with the long-term goal of biodiversity conservation. Hence, these two tracks of aims are usually at loggerheads with each other (Sawhney, 2003).

#### 4.2.1 Data Analysis

Relocation:

*Have you been asked to relocate?*

During our study, we observed several trends in the responses to this question. Most respondents from villages which were at a considerable distance from the park answered that they had never been asked. Those who had been asked claimed that no official procedure was underway. Some respondents also related incidents of other villages which had been relocated in the past or were on the verge of relocation. Two respondents from Ranchha claimed that they were familiar with the concept of relocation. However, there were no talks regarding the same in their village.

“Heard that has happened in Garhpuri. But haven’t heard anything here”-(P004)

“We haven’t received such a notice. In Garhpuri, people have been asked but not in Ranchha  
“(P015)

However, respondents from villages located in the core or partially inside the park premises gave both negative and positive answers. There were common experiences shared by many regarding past conversations about relocation, but no such steps were taken after the conversation. Others had never been approached by officials to initiate the process. A

respondent from Kathali expressed apprehension regarding such a process being carried out in his village.

“No the government hasn’t. It’s also a very old village with so many people residing in it. The government cannot move all of them. Where will we get so much land? There is also a lake so we get water but there is no electricity” -(P048)

Bamera and Garhpuri were the only two villages from our sample which were undergoing the process of relocation and provided a first-hand experience of the same. A respondent from Garhpuri expressed his dissatisfaction with the compensation promised for relocating.

“Yes, they offered 10 lakhs. But, that is very less. We won’t even get land for that price.” - (P007)

	<b>Respondent Type</b>	<b>For Relocation</b>	<b>Against Relocation</b>	<b>Significance Value</b>
<b>Total Groups</b>	All respondents (n=40)	27.5% (11)	72.5% (29)	-
<b>Gender</b>	Male (n=29)	20.68% (6)	79.32% (23)	0.117
	Female (n=11)	45.45% (5)	54.55% (6)	
<b>Literacy</b>	Literate (n=25)	32% (8)	68% (17)	0.41
	Illiterate (n=15)	20%(3)	80% (12)	
<b>Caste</b>	ST (n=12)	12% (2)	88% (10)	0.173
	OBC (n=12)	33.33% (4)	66.67% (8)	
	General (n=9)	55.55% (5)	44.45% (4)	
<b>Sub groups significant at p=0.05 level</b>				

Source: BTR Management Plan 2006

*Do you want to relocate?*

28.94% of the respondents were ready to relocate if given a choice. They cited the lack of development and job opportunities as reasons for their acceptance of the offer. However, others



expressed their attachment to their ancestral homes and complained about the unfair deal they were being offered for relocating. Respondents expressed their grievance with the current system of compensation.

“Yes, they have asked us to relocate. But we won’t go without proper compensation. 10 lakhs are very less. I could end up spending 10 lakhs for land itself. How will I make my house then” - (P008)

“They tell us that they will give us compensation of about 10 lakhs. But it’s not enough at all. Even if you want to get your daughter married it takes about 4-8 lakhs, 10 lakhs is nothing. If we are given good land as per our choice by the government, we are ready to move out.” - (P052)

No significant difference was observed in the subgroup divided on the basis of literacy ( $p=0.41$ ). However, literates (32%) were more likely to opt for relocation than illiterates (20%). Such discrepancy could be based on the level of awareness as well as the lack of job opportunities for literates in the park area. The major occupations practised in the region are agriculture or manual labour; none of these professions supports the ambitions of literate occupants of the villages. Another factor to note is their awareness of the lack of development in these villages and the absence of avenues. A 10<sup>th</sup> grade pass respondent expresses his views when asked about his stand regarding relocation.

“I want to say that it’s better to leave. But old people don’t understand this. They have been living here since a very long time. But there are no facilities here and children are not able to study so its waste living here.” - (P017)

No significant difference was observed in the subgroups based on caste ( $p=0.17$ ) and gender ( $p=0.15$ ). However, women (45.45%) were more likely to be welcoming towards the idea of relocation than men (22.22%). Similarly, OBC (33.33%) and General (55.55%) caste members were more likely to support relocation than those belonging to Scheduled Tribes (16.66 %).

Women may have been more welcoming towards the idea of relocation as their roles were mostly entwined with household responsibilities and child rearing. Living in an area that is less dangerous and benefits the growth of the family will then be a tempting offer for the primary caregiver of the household. Most female respondents were married into the village and had no ancestral connection to the land. The lack of the sentimental connection to the land also adds to their ease of relocating from that land. On the other hand, most men view land as their primary source of income and family pride. Hence, it is harder for the male members to leave their land.

The caste disparity observed can be a result of the financial security faced by different castes. While most general and OBC members earn their living by agricultural practices or manual labour, ST members are dependent on the forest for everyday needs as well as financial avenues. In most villages, we observed that the lower caste members resided nearest to the forest and were dependent on the forest for fuelwood and NTFPs. Another difference to note is that ST members did not usually own agricultural land. Hence, if relocated, they will be left without land and forest resources. A compensation of INR 10 lakhs will not cover their financial needs. With no modern skills, the only financial avenue left for them will be manual labour which will move them even lower in the social and financial hierarchy.

Relationship with the Forest Department:

*How are your relations with forest officials?*

We asked this question to local inhabitants of the villages to understand the complex relationship shared by the two social stakeholders. Though a Panchayati<sup>13</sup> system of administration was in place in all the villages, the villagers have to work closely with the forest department for the management of these villages. The proximity of these villages to the park poses some limitations on their development and the daily lives of the village communities. While conducting the research, we faced extreme difficulty in commuting between villages

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<sup>13</sup> A village governing body comprising of 5 members

present inside the Park. In Garhpuri, people complained that there was no electricity as they were inside the premises of the Protected Area. A respondent in Bamera expressed his frustration when asked about government schemes in effect in the village.

“Pradhan Mantri Awaas Yojana is there. But they don’t even let the roads build here.” -  
(P052)

Another point of conflict we discovered during our literature review was the restriction levied on the movement of local communities into the forest area. It is the responsibility of forest officials to stop villagers from entering the forest to graze their cattle and collect NTFP and fuel wood. This creates friction between the two stakeholders as these restrictions present problems in the community’s daily functioning.

However, during this research, we found out this was more of a theoretical principle than a practice in reality. Most villagers still entered the restricted areas and were mostly allowed to do so in certain areas by the forest department. Two respondents related their own experiences with the forest officials.

“It’s good. They don't trouble us. Sometimes when we collect baas and things alike, they put a bit of pressure but even then, not too much. They understand that we will do it so they let it go.” -(P031)

“Personally my relations are fine. My cows go inside the jungle; no one stops me” -(P033)

Biodiversity conservation is not the only responsibility carried out by the forest department. Making sure that this conservation process does not interfere with the welfare of the local communities is also imperative. They deal with animal and cattle attacks and provide compensation for any losses incurred by these attacks. In BNP, we discovered that although compensation for tiger attacks was readily given, villagers reported that they were more concerned with wild pig attacks. Repeatedly, respondents related stories of crop damage and the inaction on the forest department’s part to control these wild pigs.

“I have gone twice or thrice. They have a samiti... It would be great if they put high fences and build a wall so that the problem with the wild pig gets sorted and our crops do not get destroyed. We will have freedom” -(P054)

The development of the relationship between the two stakeholders is a constant struggle. Some villagers claimed that they had a good relationship with the forest officials. However, there was a common attitude shared by most respondents that the forest department prioritised wildlife over the human inhabitants of the Reserve.

“Not good. If an animal is in some problem, they will rush and come in no time. But if it’s a human, they will never show up. They prioritise animals over humans.” -(P073)

When we asked the forest officials about their relationship with the locals, an overwhelming number of respondents claimed to have good relations with the villagers. Most officers believed that the relationship had grown to be more positive in the recent times.

“I think that it is much better than before. In this matter the Director also goes to the villages and meets people. They are very close and the Director treats them like his own house members. I think that there being such a Director is good for the park. The one who is with us today.” - (F003)

However, some officials recounted incidents where villagers had grown agitated with the forest department as a result of animal attacks. Most villagers view animals as the Forest Department’s responsibilities. When these animals attack, many times villagers blame the Forest Department for their loss.

“They get compensation in the form of money but when men are attacked then it's a problem.”- (F009)

“They treated the cow's wound with betadine and stitched it."Life for life", they said, "We don't need your cheque. We will cut you! We will kill you" - (F012)

## Discussion

### Relocation:

Overall, respondents in this study were aware of and open to the idea of relocation. The degree of willingness differed across to gender, literacy and caste, but the difference in opinion was not found to be significant. A common concern shared by all was with the current compensation being offered for relocation. Many argued that the INR 10 lakh offered by the administration was not enough for their land. They supported their claim by stating that this amount would not satisfy their household establishment and their daily income needs. Another fact to be noted was that most of them were dependent on their lands and forest resources for financial needs. They believed that the current compensation system wouldn't support their financial requirements. Some respondents also expressed their satisfaction with their current status and land; moving to a new land then did not make sense for them.

### Relationship with forest department:

Both the social stakeholders share a mutually dependent relationship. Overall, most respondents in both the groups believed that they shared a good relationship. However, local communities were concerned with the forest department's prioritisation of wildlife protection over the villagers' development. They understood the importance of conservation and were mostly satisfied with the compensation system in place for animal attacks and cattle kill. The only concern they shared was the absence of any system in place to deal with crop damage. However, both parties to a large extent agreed that this relationship is volatile and dynamic. There was a common consensus that the relationship had grown better over time.

### Conclusion:

The people-park relationship in Bandhavgarh while complex, is based on few key issues like relocation and access to resources. It was found that the local communities understood the rationale as well as the need for relocation, and agreed that it was also beneficial for them in certain aspects. Their concerns primarily were with the inadequacy of the support provided by

the government to relocate. The local communities also were aware of, understood, and supported the idea of conservation while being concerned about the apparent prioritisation of wildlife over human life in the forest department's approach. The forest department officials acknowledged the existence of conflicts in the relationship and consciously try to resolve them for forging a relationship improves conservation as well as social and economic outcomes.

### 4.3 Social Stratification

The vision of community, as a 'unified and organic whole', failed to address the differences within it (Agrawal et al., 2001). A conversation related to a community must be looked at in relevance to its social context. While studying the various tenets of BNP, exploring social structures and recognising their influence on the local communities helped us obtain a holistic overview of BNP. A simplistic understanding that considers the local community as a homogenous construct often leaves out certain sections of the community since neither all benefit equally nor everyone is disadvantaged equally. In the context of BNP, gender and caste are two major subgroups that are affected differently in terms of people-park relations, resource management, ecotourism and conservation interventions which ultimately influence their attitude towards the formation of the Protected Area.

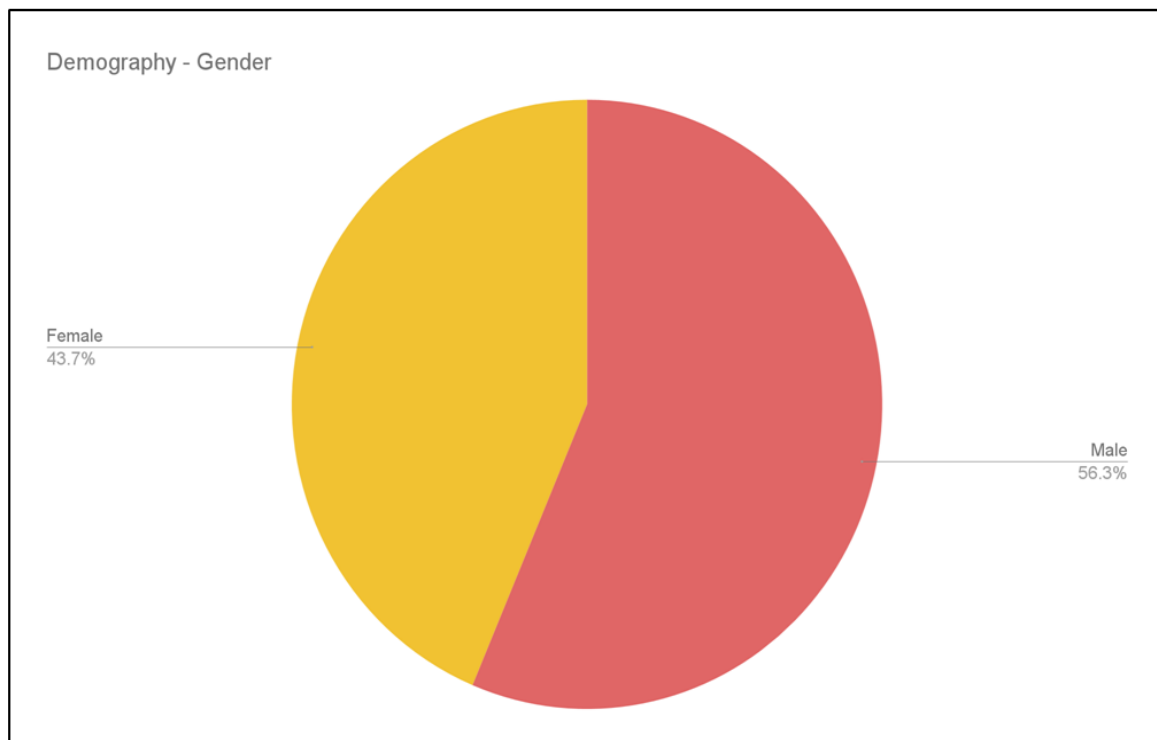
**Table 5 Social Stratification - Attitude Towards Conservation**

	Respondent Type	Positive	Negative	Significance Value
<b>Total Groups</b>	All respondents (n=22)	27.5% (14)	72.5% (8)	-
<b>Gender</b>	Male (n=19)	68.42% (13)	31.58% (6)	0.24
	Female (n=3)	33.33% (1)	66.67% (2)	
<b>Literacy</b>	Literate (n=13)	76.92% (10)	23.08% (3)	0.203
	Illiterate (n=8)	50%(4)	50% (4)	
<b>Caste</b>	ST (n=8)	50% (4)	50% (4)	0.167
	OBC (n=6)	66.67% (4)	33.33% (2)	
	General (n=5)	100% (5)	0% (0)	
<b>Sub groups significant at p=0.05 level</b>				

## Gender

The aim was to maintain parity in terms of gender in our sample. Therefore, women constituted 43.66% of our total sample. It was made sure to assess behaviours, attitudes and participation of women in park-related issues. The primary data shows that the proportion of women that had a positive attitude towards the formation of the Protected Area (33.33%) and conservation (33.33%) was much lesser as compared to men out of which 50% and 68.4% held a positive attitude towards the formation of the park and conservation respectively. The reason for this disparity lies in the lack of understanding of conservation in women. Due to the limitations of exposure and awareness in a patriarchal society, women often take the back seat in such endeavours. Moreover, the perspective of the women of remote villages is majorly centred on their family and household. The welfare of their husband and children is their first priority. On the contrary, due to the exposure they get, men are able to comprehend the situation of the park. Therefore, they maintain a positive outlook towards the Protected Area and conservation.

**Chart 6**



Source: Primary Source



**Image 5: Women of the village Ranchha assemble for an FGD**

Source: Discover India Program, 2017 - 2018

However, women were more likely to be welcoming towards the idea of relocation than men (45.45% women and 22.22% men had a positive attitude). Being the main caretakers of the family, the lack of basic amenities like high school and hospitals in villages situated in and around the park was a point of major concern for the women. Thus, the idea of relocation appeals to women more than men. Further, the dangers posed by the wild animals, especially for children, becomes another point of concern for them.

Under ecotourism, women don't get enough employment opportunities as men, since most of the jobs are considered male oriented and are assumed by men. When there is no exposure, women form the same opinions as men and lose their individuality. And even if a woman has a different opinion, it is either neglected or not considered important enough.



An absence of such opportunities reduces the possibilities of exposure and learning for women; and stunts their development. In an environment where men already have an upper hand, it becomes even more important to educate women and expose them to issues related to their surroundings. This makes community-based conservation complete and also helps in empowering women. It was observed that the women were more apprehensive while talking about issues surrounding BNP than men. Women showed a sense of insecurity due to their lack of education which was a recurrent theme in several responses by women.

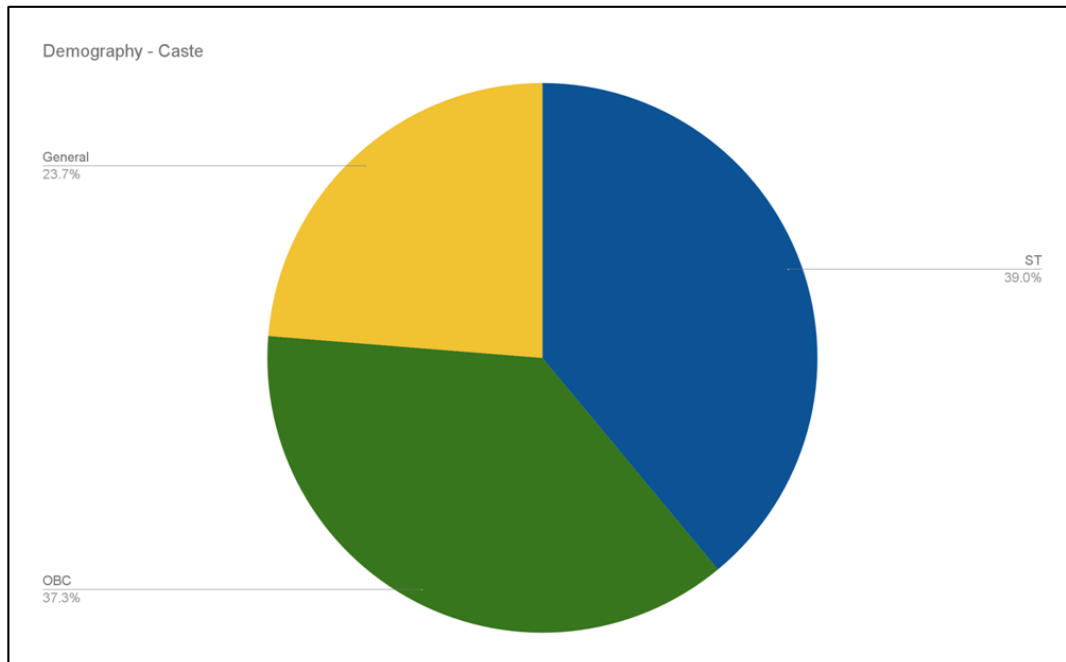
*Why do you think the forest dept. gives so much importance to the wild animals?*

“We just think that our bodies should be safe. We don’t have brains; we are not educated enough to say all this.” –(P001)

### *Caste*

In BNP, three major divisions were identified based on caste. The general category (23.72% of the sample) consisted of Brahmin, Thakur, Rajput, Patel, Tiwari and Gupta. The Other Backward Classes (OBC) category (37.28%) included Yadav, Patel, Prajapati and Kumar. And, the Scheduled Tribes (ST) category (38.8%) comprised Gond, Baiga and Adivasi. Respondents of General category showed the most positive attitude towards conservation (100%). But going lower into the caste hierarchy, lesser people had a positive attitude. Sixty-six percent respondents of OBC and only 50% respondents of ST had a positive attitude towards conservation. The result is not surprising because societal benefits depend a lot on the hierarchy of the community. The households of General category owned bigger lands; therefore, their monthly incomes and literacy rates were higher. They were able to understand the importance of conservation and also did not have to face the problems like the respondents of other castes (especially members of ST) caused due to the intervention of conservation projects.

**Chart 7**



Source: Primary Data

The caste divide was spatially evident since most of the villages were divided into sections called *Tolas* by caste. Another insight regarding the caste dynamic was that the respondents of General category were not preferred by the park officials for employment because they denied taking up menial jobs unlike the members of ST. This had further deteriorated the relations between the higher and lower castes. One of the respondents belonging to General category (Brahmin) expressed how he felt that his caste was “discriminated” against the ST; ignorant of the fact that reverse casteism does not exist. He also spoke about discrimination on the basis of distribution of resources in the village:

“No, Adivasis have access to everything. They have been given land also by the government. When Shivraj Singh came, he gave as much land to *Adivasis* as in their sight. If the *Adivasi* can see till a kilometer from here, they'll a kilometer-long strip of land. Generals don't get any land. This is discrimination” -(P063)

These responses show that there was an undeniable mental and spatial divide within the local community which ultimately affected the development of the community as a whole.

Conclusion:

A study on gender and caste in conservation is intricate and requires the researcher to spend a lot of time with the local community. Due to the limitations of the short timeline, it was not possible to get the women and respondents at the lower end of caste hierarchy to speak their minds freely. However, the observations of their behaviour, households and the environment their interviews were taken in, speak volumes about their roles in the community and the relationships they share with the forest.

#### **4.4 Forest Management**

##### 4.4.1 Structure and Organization

All Indian Tiger Reserves follow Project Tiger guidelines for structure and organisation. The Field Director working at the Conservator of Forests level heads the Reserve, supported by the Deputy Director at the Deputy Conservator of Forests level. The Deputy Director is also employed as the drawing and disbursing officer. The Tiger Reserve consists of two Protected Areas - Bandhavgarh National Park and Panpatha Wildlife Sanctuary. Therefore, the administrative unit is divided into two subunits with Assistant Directors as their heads at Assistant Conservator of Forests level. Further, the administrative area is divided into four ranges headed by Forest Range officers. Ten range assistant circles and 46 beats are respectively headed by Foresters and Forest Guards (Prakasam, 2006).

Panpatha follows a similar administrative structure. Panpatha is a single range sanctuary accompanied by four range circles and 20 beats. In usual cases, sanctuaries are led by a Superintendent employed at the level of an Assistant Conservator of Forests. However, there

have been no appointments for the post of Panpatha Superintendent, and the sanctuary is currently controlled by the instructor (ACF) of Biodiversity Training Centre (Prakasam, 2006).

#### 4.4.2 Responsibilities

The administration's responsibilities include protection and conservation of wildlife, ecotourism, eco-development, human-wildlife conflict resolution, human resource development, monitoring and evaluation of different eco-development and conservation initiatives. Some drawbacks that have been interfering with the completion of these tasks include a shortage of frontline staff, no replacement found for the post of Veterinary surgeon since 2003 and the absence of a sanctioned post for a Research officer (Prakasam, 2006).

#### 4.4.3 Amenities and Benefits

The service conditions of forest department employees are risky and arduous. Those whose work is centred inside the forest have to live at inconvenient and remote sites. The pay benefits and amenities are far less than they require. The lack of benefits and the danger associated with the job profile are two of the main reasons why so many posts are still vacant (Prakasam, 2006).

Realizing the lack of such amenities, the Directorate of Project Tiger, Ministry of Environment and Forests made funds available while approving the Annual Plan Operations of the Tiger Reserves as *Project Allowance*. The Chief Wildlife Warden of Madhya Pradesh also pays an incentive of INR.400 per month from the wildlife tourism proceeds to forest guards posted in remote areas. However, these benefits are not offered to *Chara-cutters*, *mahouts*<sup>14</sup> and foresters<sup>15</sup> who also serve in such strenuous environments (Prakasam, 2006).

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<sup>14</sup> A person skilled in riding and taking care of elephants

<sup>15</sup> A person responsible for taking care of the forest

Forest Guards usually stay in patrolling camps, and few frontline staff members have quarters at their posting sites. The absence of basic amenities at their remote posting sites forces many to maintain another establishment for their family in a nearby village or town. Though accommodation is provided for four families at District headquarters, the same is not provided to the field staff (Prakasam, 2006).

## Data Analysis

### *How difficult is this job? What problems do you face?*

This question was asked to employees of the forest department. As mentioned earlier, their working conditions are extremely tough and strenuous. Though some officers were reluctant to open up and discuss their problems, we gathered a sense of unease among the employees regarding their work conditions.

Many guards posted at the park gates we visited expressed annoyance with their long shifts and unreasonable working hours. A *chowkidar*<sup>16</sup> (F008) in the Tala region expressed the erratic timings associated with his job.

“At four o’clock in the night I have to go into the core zone of the forest. There tigers, cheetahs, bears they are all there, anything could eat me and nobody would be there to do anything about it.”- (F008)

"I work all day and night."-(F009)

The amount of work and the nature of their work is extremely dangerous and physically challenging. As mentioned earlier, the lack of incentives and the challenging working conditions have led to a decrease in frontline staff. This, in turn, increases the workload of the

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<sup>16</sup> Gatekeepers of the forests

current staff members. Several respondents listed extreme workload as a major challenge associated with their job profile.

“Anytime I am called I have to go.” - (F010)

"It is difficult when you have to do this job alone.”- (F009)

A common feature associated with this job profile is the constant scare of animal attacks, especially frontline staff, who reported that they had to live under this constant fear. They complained about lack of protection provided for them by the forest department.

“There tigers, cheetahs, bears they are all there, anything could eat me and nobody would be there to do anything about it. If we are able to reach the elephant, then we are safe and if we are not able to reach then the tiger could eat us and nobody would be there to do anything. Later on they would find out when they would realise that the person has not returned and then they send someone to find him. Then they would find the dead body there.”- (F008)

Another common concern that was shared by many respondents was the irregularity of salary payment. It was mostly the lower rank employees that complained about delayed salary payment and lack of a systematic body to listen to their complaints.

“Salary is not given on time. Work is not very hard because I just drive.” - (F011)

“Here I don’t get my salary from time to time. In four months I get one month’s salary. Today it’s been 15-20 years since I’ve been working in the forest. They give six to seven thousand, not more than that. Very rarely if we complain a lot maybe in six months they add INR 150-200 to our salary. They don’t do anything more than that.”- (F008)

Discussion

Overall, there were common concerns expressed by the respondents. The constant fear for one's life and the dangerous work environment decreases the appeal of a job in the forest department. Added to this, irregularity in salary payment and long working hours further decreases the attractiveness of this employment. Hence, it is not surprising to note that many frontline posts are vacant. Another disturbing trend to note was that lower level employees had a greater number of complaints that no one in the top ranks cares or listen to their grievances.

#### Conclusion:

Forest department is the pole of support behind the functioning of the park. They work in extremely strenuous and dangerous environments. Though according to the official statement, there are incentives provided as mentioned earlier, this research shows that ground reality is extremely disheartening. Many complained of not receiving salaries on time, long working hours and excessive workload. The park cannot function without these officials, and their deteriorating working conditions do not encourage more recruits to join.

# Through the Lens of Economics



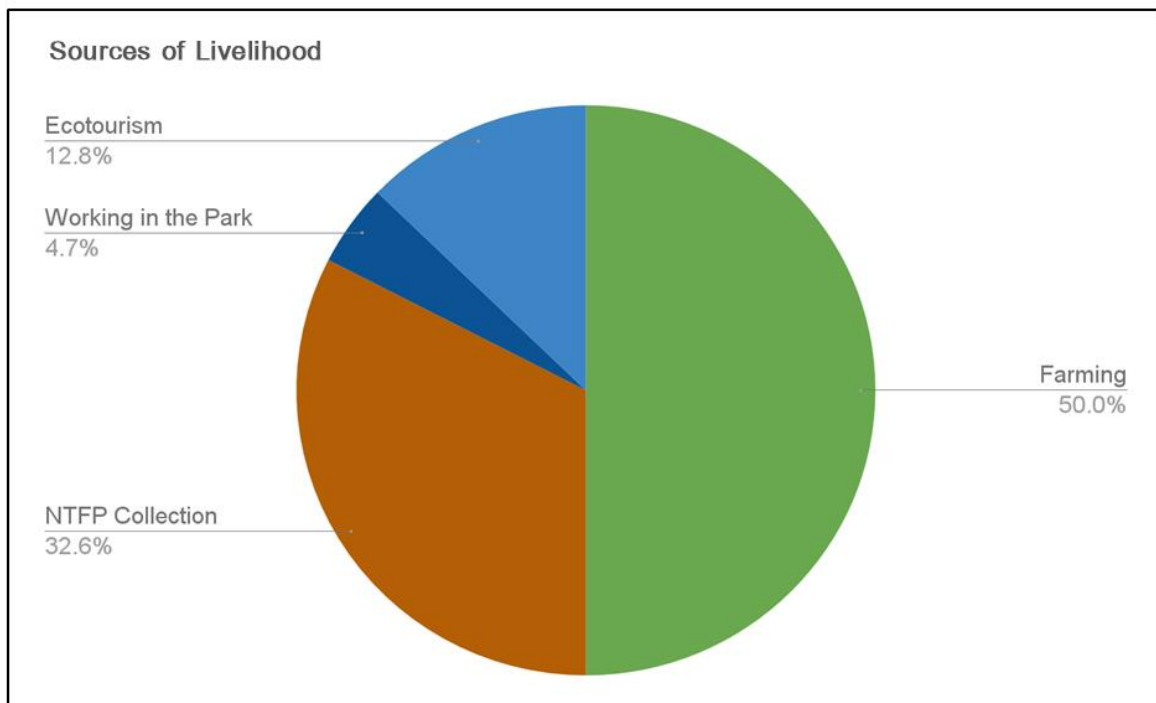


## 5.0 Through the Lens of Economics

### 5.1 Introduction

In a Protected Area, it is important for the local communities to have a range of sources of livelihood available for them. A lack of this results in financial constraints and increasing poverty, as people who live in isolated conservation enclosures have few employment opportunities. Since these communities are usually resource dependent ones, they suddenly find that many avenues which were previously open to them are closed once the region they live in gets incorporated into a conservation zone. Focus then effectively shifts to a certain degree from people-based policies to wildlife-based ones. Still, in Bandhavgarh, this focus has not shifted on the whole; the local communities still have opportunities to work in the area to support their families. The main sources of livelihood in BNP constitute farming, ecotourism and Non-Timber Forest Produce extraction.

**Chart 8**



Source: Primary Data

## 5.2 Ecotourism

The tourism policy of the Government of India defines ecotourism as the enjoyment of nature by the tourists in a manner that does not impact the ecosystem adversely. In 1983, the term 'ecotourism' was coined to emphasise the development and management of sustainable tourism, making it an internationally accepted tool for conserving biodiversity (Prakasam, 2006). Ecotourism aims to ensure socio-economic benefits for the local communities who are the primary stakeholders of an ecosystem. Mass tourism is economically essential, but ecotourism strives to maintain a balance between defending the earth and protecting and sustaining the local communities. Moreover, ecotourism helps to elicit public support needed for wildlife conservation (Prakasam, 2006).

Twenty-four percent of the Bandhavgarh National Park area, i.e. 105 sq. km of Tala range is used for tourism. The park remains continuously open for nine months, usually from 1st October to 30th June with an annual influx of around 25,000 tourists (Prakasam, 2006). Tiger being a major attraction, BNP attracts tourists from Britain, France, Germany, and the USA who constitute about 16% of total visitors. Presently, the tourism in BNP is confined to safaris and park visits each year by tourists in vehicles and on elephant-back. Ecotourism is considered to be a significant source of income for the local communities. The locals are engaged with it through jobs like that of tour guides, vehicle drivers, operators of park excursions, and managers or labourers in private resorts, cafeteria and grocery shops etc. (Prakasam, 2006). Community-based tourism is a preferred viable option because, for the larger cause of conservation, the local communities suffer the most and are deprived of various privileges which they previously enjoyed. Therefore, their involvement becomes essential and must extend beyond employment opportunities. Ecotourism is imperative to attain a community-oriented and participatory approach in producing sustainable economic development.



**Image 6: Ecotourists in the Magadhi Range of the park**

Source: Discover India Program, 2017 - 2018

#### Data Analysis

*Does the local community get employed under ecotourism?*

Response to this question reveals that 72.5% respondents (n=40) believed that they did not receive employment opportunities under ecotourism. That the majority of respondents believe so, speaks largely of the incompetence of the ecotourism programme in BNP. It questioned one of the basic claims of ecotourism that it involved the participation of the local communities; one of the factors that separates ecotourism from mass tourism. It was also observed during our fieldwork that very few members of the local community were involved in park-related jobs. Some believed that only the lodges earned wherein the Forest Department only hired people from outside because they did not trust the local community with it.

“We don’t get any advantage from that. Only lodges in Tala earn money from tourists.” -  
(P007)

	Respondent Type	Sufficient	Insufficient	Significance Value
<b>Total Groups</b>	All respondents (n=40)	27.5% (11)	72.5% (29)	-
<b>Gender</b>	Male (n=24)	37.5% (9)	62.5% (15)	0.082**
	Female (n=16)	12.5% (2)	87.5% (14)	
<b>Literacy</b>	Literate (n=21)	42.85% (9)	57.15% (12)	0.022*
	Illiterate (n=19)	10.52%(2)	89.48% (17)	
<b>Caste</b>	ST (n=10)	10% (1)	90% (9)	0.301
	OBC (n=13)	30.76% (4)	69.24% (9)	
	General (n=10)	40% (4)	60% (6)	
*Sub groups significant at p=0.05 level **Sub group significant at p=0.1				

Source: Primary Data

There was a significant difference (p value= 0.02) observed with literacy among the respondents, 42.85% literates and only 10.52% illiterates believed that they received employment under ecotourism. It can be said that the Forest Department prefers literates for park-related jobs, which includes dealing with tourists, managerial jobs etc., and thus hire people from outside the local community. But according to the quantitative data, 52.5% of the sample was literate; still, most respondents believed that they did not receive employment under ecotourism.

There was not a significant difference (p value =0.30) in other subgroups such as caste where members of ST (10%), OBC (30.76%) and General category (40%) believed that they received employment under ecotourism. There was a wide difference between the opinions of respondents of the ST and General category. The respondents of the General category owned

farms unlike the respondents of ST who usually worked on landowner's farms. This creates a difference in their financial conditions and literacy levels which ultimately influences their perspective on ecotourism and employment opportunities provided under it. Though most of the responses were negative, some respondents spoke positively of the employment opportunities. They affirmed to the rise in job opportunities and talked about the dependence of local communities on tourism.

“After the lodge was made, people have started getting work. We come back from work around 5 or 6 and then go to our fields” – (P016)

“People are getting employment. Lot of people work as drivers or get jobs in hotels” – (P014)

“Yes, a lot of changes have occurred in people's lives. Earlier people had to work so hard but now it has become easier to make money. If anybody needs money, they go to a lodge, and there is not one lodge...there are so many of them. Wherever they get work they go. You must have seen in the morning that a lot of people carry their lunchbox on their cycle and go. All those people go to work in lodges” - (P071)

*What is the attitude of the local community towards ecotourism?*

This question aimed was to find the perspective of local community towards ecotourism managed by the Forest Department. Moreover, it threw light on their relationship. Eighty percent of the respondents had a positive outlook on ecotourism. Qualitative data suggests that respondents believed that ecotourism was not beneficial to them and only profited the government. They said that even the tourists that come are indifferent to the villagers. According to them, the benefits of ecotourism were not worth the restrictions imposed on them since the formation of the Protected Area.

“No no, what profit to us. The government gets a lot of profit. We have no profit. They come, click pictures, and don't give us anything. Give it to the government but nothing to us and leave. They give for the village to the government.”- (P002)

Table 7 Ecotourism-Attitude Towards Ecotourism				
	Respondent Type	Sufficient	Insufficient	Significance Value
Total Groups	All respondents (n=15)	80%( 12)	20% (3)	-
Gender	Male (n=12)	83.33% (10)	16.67% (2)	0.518
	Female (n=3)	66.67% (2)	33.33% (1)	
Literacy	Literate (n=12)	75% (9)	25% (3)	0.77
	Illiterate (n=3)	66.67 % (2)	33.33% (1)	
Caste	ST (n=6)	83.33% (5)	16.67% (1)	0.949
	OBC (n=5)	80% (4)	20% (1)	
	General (n=4)	75% (3)	25% (1)	
Sub groups significant at p=0.05 level				

Source: Primary Data

Among the total respondents (n =15) 83.33% of male respondents and 66.66% females had a positive attitude towards ecotourism. This was a recurrent happening since in most households the opinions of the male members are assumed to be the opinion of all the other members, and women often hesitated to put their view forward.

There was not a significant difference (p value =0.71) in terms of literacy, 76.92% respondents who were literate and 66.66% illiterates had a positive attitude towards ecotourism. Apart from employment opportunities, the reason for more literate people having a positive outlook could be the lack of awareness of the importance of conservation among the respondents who were illiterate.

Similarly, there was not a significant difference (p value =0.94) in terms of caste, 83.33% of ST, 80% of OBC and 75% of General category respondents had a positive attitude towards ecotourism. Their outlook was similar in terms of the need for conservation of wildlife.

“Yes. We do understand the need and hence are very cautious. We try to save animals and make sure nobody attacks them for any reason. We all live with each other in peace.”- (P020)

## Discussion

Overall, respondents felt that ecotourism was more beneficial to the government than it was to the local community. One of the major reasons for the same is neglecting the existing community dynamics and assuming that ecotourism projects exist in a vacuum. In a heterogeneous group, it is inevitable that some member will benefit more than others (Brockington, Duffy, & Igoe, 2008). Thus, a homogenous approach to economic development is not feasible.

### *Gender*

According to the data, there was an apparent disparity, between the attitudes of men and women regarding the perception and employment opportunities under ecotourism. The disparity is due to the unawareness and lack of exposure regarding the formation of the park and ecotourism amongst women. Moreover, there are no employment opportunities for women under ecotourism.

### *Literacy*

There was a significant difference between the perception and employment opportunities among literate and illiterate respondents regarding ecotourism. Most of the jobs require specific skills, therefore, more literate people were hired. Another possible reason why literate respondents have a more positive response could be their awareness regarding conservation. During our research, it was found that most of the respondents were unaware of the reasons for conservation of forest and tigers. This is why local community often feels that tourism has been imposed on them forcefully. On the positive side, the educated do benefit from the job opportunities that ecotourism provides.

### *Caste*

Though there was no significant difference among various caste groups according to our

quantitative data, the power dynamics that exist within the community cannot be ignored. Most of the villages were divided caste wise into different *tolas*. This shows that caste is a huge factor; and thus, affects each member differently, both socially and economically.

Conclusion: Ecotourism was meant for the development of the park, tourism and the local communities living around it. But the local community did not think that it has fulfilled its promise of providing better economic opportunities for them. Since the benefits of ecotourism are not shared equally, local communities view the Forest Department in a bad light and do not trust them.

### **5.3 Non-Timber Forest Products (NTFPs)**

All forest products such as fruits, berries, nuts, seeds, honey, grasses, medicinal plants, gums, fuelwood and flowers, excluding timber, are together known as Non-Timber Forest Products (NTFP) or Minor Forest Produce (MFP). These products play a major role in the lives of local communities who depend heavily on the same for food for the people and the livestock and to add to household income (Sawhney, 2003). Majority of the households interviewed during the study collected NTFPs.

The collection of non-timber forest products such as *amla* (*Emblica officinalis*), *char* (*Buchanania Lanza*), *ber* (*Zizyphus mauratiana*), *tendu patta* and fruit (*Diospyros melanoxylon*), *mahua* (*Madhuca indica*), mango (*Mangifera indica L.*), *jamun* (*Syzygium cumini*), sal seed (*Shorea robusta*), *dori* (*Mahua* seed), honey and medicinal plants had been a traditional part-time job for the villagers (Sawhney, 2003). The Park has also been an important source of fuel for the people as the wood from the Park was used as fuelwood for cooking and heating needs. Although the extraction and sale of fuelwood from inside the core is illegal, it has been a source of income for some villagers. Other important sources of fuel for the people included dung, crop residue and grass (Sawhney, 2003).





**Image 7: Mahua, a NTFP collected from the forest**

Source: Discover India Program, 2017 - 2018

The collection of NTFPs from core areas of BNP was non-existent, but the collection of Mahua, and Tendu leaves was still prevalent in the extended areas of the Park and the Sanctuary. However, the Madhya Pradesh government, following through with the Supreme Court's decision, soon prohibited the collection of NTFPs from PAs (Prakasam, 2006). Since NTFPs were mainly, but not always, collected by women, they could also be a source of financial empowerment for them.

#### Data Analysis:

Although the collection of NTFPs is banned in BNP, there were mixed reactions and compliance towards the law. While some participants said that they do not collect any NTFPs, others said that they do because NTFPs prove to be important for personal use in the house as

well as for sale in the city. The main NTFPs the participants talked about collecting was Mahua and Tendu leaves.

*Do people in this village collect mahua and tendu patta?*

In most of the villages, the residents said that although they are not legally allowed to, many of the villagers enter the Park to collect Mahua and Tendu leaves, both for domestic as well as commercial purposes.

“Many people collect. We also collect. It helps us earn a little money by selling them in the market. We go and collect it very slyly. We are not allowed to collect it officially.”- (P019)

“Nobody from my house goes but around 70% of the village goes [to collect NTFP]”- (P023)

Participants from the buffer zone villages of Ranchha and the core zone village of Guruwahi were more open about admitting that they collect NTFPs as compared to others. Opinion on the reasoning for the ban was divided, with some saying that it was for their protection and the others taking a more negative approach towards it, such as:

“No, collecting NTFPs is strictly banned. They only want animals to eat everything and nothing for humans.”. -(P008)

All participants who agreed to have been collecting NTFPs from time to time paid main emphasis to Mahua and Tendu leaves; although a few said that sometimes *amla* is also collected. Since the collection of NTFPs has for long been an important source of income, it has been difficult to check illegal collection. Thus, illegal collection continues around human habitation in the Reserve and the fringes.

According to the BNP Management Plan, several cases of forest fires that take place from March until May occur because of the collection of Mahua and Tendu leaves. The burning is done to create ground clearance to collect Mahua and to get a fresh batch of Tendu leaves

(Prakasam, 2006). When asked about the penalty in case they get caught, participants gave mixed replies which depended on their proximity to the core zone.

“They take him[villager] to the range and conduct a trial against him and send him to jail”-  
(P022)

“No, but few people go to collect fuel wood. If we are caught, we have to pay fine up to INR 5000/-.” -(P010)

“They are scolded and sent away. If they do wrong things then anything can be done with them. If they light fires. What will happen if they light fire? Nothing, in fact it causes harm to us.”- (P015)

P022 is a resident of Lakhumar and P010 of Kathli, both of which are villages that lie in the core zone of the Park. The penalty levied on them is harsher than a penalty that would be levied on P015, the resident of the village of Ranchha, which lies in the buffer zone of the park; this is because the FD policies for the core zones are stricter. Since there are around fourteen villages in the Reserve and almost 152 villages that lie in the periphery of the same, they exert heavy biotic pressure on the PA (Prakasam, 2006). The villages around the Reserve often have residents who sneak into the park for the collection of NTFP products; this causes a lot of disturbance to the habitat.

*What fuel do you use in the house?*

The government has provided some villagers with stoves and Liquefied Petroleum Gas (LPG) cylinders, although this is not the case overall. Most households still depend on wood from the forest as a source of fuel. Moreover, the households which have been given LPG by the government prefer using wood nonetheless, as they are more comfortable with using the same.

“We cannot afford a gas connection in our house, so we using dry sticks at the moment. We pick up dry sticks from the forest and use for the stove at home.” - (P019)

“The government has provided with gas cylinders, but people tend to use the old way of burning dry sticks because it is more feasible and easier.”- (P020)

Although people have access to different sources of fuel, most of the households still preferred the use of wood. Crop residue and grass as sources of fuel were barely used. Some households said that at times they would mix dried cow dung cakes with the wood while burning, but that was mainly used to light the fire.

“We were given gas by the forest department but we still use wood mostly. We get it from inside the park”- (P014)

Firewood is still the primary source for energy sustenance for the majority of villages around and in the Reserve, even though the government has provided gas as a substitute. Collecting firewood for household purposes is a privilege given to the villagers who are living in the Reserve. But for those who live on the fringes, this is not the case. They, hence, try to meet their needs by illegally entering and collecting firewood from the Reserve (Prakasam, 2006). P014 was a resident of Ranchha village, which lies in the buffer zone of the park. Hence, for P014, collecting wood from the Reserve is a necessity. This was the case in the other villages of the buffer zone as well, such as Kuchwahi and Guruwahi. To deal with this problem, the Forest Department has constructed many biogas plants and is also considering distributing smokeless *chulahas* to the villagers (Prakasam, 2006).

#### Discussion:

Not allowing villagers to collect NTFP helps preserve the natural habitat of the wildlife as it keeps it free from human intervention. But at the same time, the main grievance of the villagers was that it marks the disappearance of a major source of income and deprives them of products they can use for the sustenance of their households as a food source. The illegal collection of NTFPs and collection of wood as a fuel source from the park is dealt with efficiently because although there is some resentment amongst the inhabitants regarding its ban, it is not a situation out of hand. Still, stray incidents do take place, mainly on the fringes of the Park. But the officials understand the same as they know NTFP's are important for domestic purposes.

Losing the right to the collection of NTFPs is a problem which local people belonging to BNP have faced; this has affected their income as well. At the same time, illegal collection of NTFP is an issue which the Forest Department have to manage as well (Prakasam, 2006). When there is a shortage of food, Mahua and Tendu leaves serve as supplementary food for both the people and their livestock. It is important to realise that NTFPs can potentially be a source of large-scale employment and can help in reducing poverty (Sawhney, 2003). They can empower women, who are major collectors of NTFPs, and the indigenous community, thereby providing them a way to be financially less dependent on other members of the household. This is because they offer not only food security but also an opportunity to build small sustainable enterprises.

Although the villagers had access to other sources of fuel such as crop residue, grass, dung and at times, even government provided LPG gas, the majority of the households preferred wood. They used wood for cooking and heating purposes, and a majority of them collect this wood from the Park. They also stock this wood to use it during monsoon as wet wood is difficult to use. Since the Park is an important source of fuelwood for the villages not only inside the Park but also on the fringes, it becomes important to enforce deterrent protection measures to ensure that the problem does not get out of hand as there is an increasing population which increases pressure on the forest resources.

Apart from using it as fuel, wood is also used by villagers for fencing around their farms to protect their crops from wild animals. Some also sell the wood. Since felling of trees is illegal, if the FD strictly enforced this law, they would be heavily fined, and their sources of wood would be minimal to non-existent (Sawhney, 2003).

#### Conclusion:

The local communities have been cut-off from mainstream development that has been taking place outside Bandhavgarh; this is because there is a lack of infrastructural development and the region is isolated. The villagers have been conventionally dependant on the forest resources because they have easy access to it and have been engaged in such practices since generations.

The participants interviewed were dependant on the resources from the Park for household and income generation purposes. Although there is a clear ban on the extraction of resources from

the Park for income generation purposes, participants interviewed revealed how they nonetheless enter the Park to collect and use, or sell, forest produce. This incorporates both fuelwood and NTFP. They are heavily reliant on the Park for survival.

The management and the people in BNP have worked successfully so far and have been coexisting in peace, but now there are certain grievances that are beginning to surface. The Park Management has taken the responsibility of introducing eco-developmental work, but the required level of awareness is yet to be reached.

#### **5.4 Farming**

Land usage in Bandhavgarh dates back to the 1860s when the local communities had unrestricted access to the forest. The agricultural methods employed then reflected a simplistic way of living. This meant that there was a tendency to grow light crops, shift cultivation and employ crude agricultural instruments. Slowly, the light crops which were grown mainly for household consumption gave way to wheat, paddy and other cash crops. Better agricultural methods and instruments came into use and income generation via agriculture became the focal point of attention (Prakasam, 2006).

In Bandhavgarh, the basic source of income generation for the people is farming and labour. In most PAs, different forms of economic activities such as Minor-Forest Produce (MFP) collection, forestry, agriculture and livestock exist simultaneously. But almost all of these activities have certain restrictions imposed on them to ensure they do not adversely affect the schemes and conservation efforts of the Park. This often leads to grievances on the part of the local communities, who are dependent on natural resources for survival (Prakasam, 2006).

There are around 60 villages which are in close proximity to the Park. In these villages, the main occupations are rearing of cattle and farming. In Bandhavgarh, people focus more on agriculture for their own sustenance than for selling. Wheat (*Triticum aestivum L.*), maize (*Zea mays L.*) and rice (*Oryza sativa L.*) are the main crops which farmers grow. The various streams present around the park provide seasonal and perennial sources for irrigation, although some villages, like Gadpuri, are irrigated with the help of reservoirs (Prakasam, 2006).

## Data Analysis:

Majority of the participants interviewed were either farmers or had farmers in the household. The local communities were highly dependent on agriculture and crop production for their sustenance than for other purposes. According to the majority of the participants, their common grievance was that wild pigs enter their farms at night and destroy the crops. For this reason, a strict vigil was kept. The villagers kept awake during the night, lit fires and slept on *machaans*. It was surprising to find out that the farmers were more troubled by the boars than other wild animals present (tigers, for instance).

*Has there been any change in the land that you have in past 10 - 20 years?*

One of the assumptions made at the beginning of the research was that the land belonging to the local farmers would have been incorporated into or encroached by the Park post-1968. But the participants informed otherwise.

“No, there hasn't been any change. My father also had this much land only.” -(P038)

“It's the same as it was passed onto us by our ancestors.” -(P063)

Participant 38 was a farmer while Participant 63 had members of the household who looked after their ancestral farmland in BNP. The common reply given by all participants was that post-1968, there has been no change in the land area which they used to own. Even for villages which were incorporated into the area of the Park in due course, their land was not encroached in the land area of the Park as it grew. Not more than 2 participants, out of a much larger group of over 50 that were interviewed, said that their land holding has decreased, but this was definitely not the common belief.

“Before there were a lot of problems, so before if you did farming and my father has seen this, it would only last for 2-3 months; 5-10 years back. Today, a lot of people are very prosperous from farming only, they are moving forward only.” -(P038)

Over the course of change in BNP, as Participant 38 mentioned, agriculture gained prominence as a vital source of livelihood. It became not just a seasonal but a year-long profession in which all members of the household, including the women, were either completely or partially involved. The change in this perspective towards agriculture has also been because the practice has now become an ancestral concept. Land owned for generations is passed on from member to member and is a matter of pride. In the advanced age of technology and development, locals want to move to cities and towns in search of a better lifestyle.

“Yes, the *gram sabha* tells us about manure, give us seeds of different variety to improve crop production”-P014

The local government body, or the *Gram Panchayat*, has been of huge help to the villagers in their development. Since *Gram Sabhas* are looked up to in the village and function as the highest local official body, they hold influence over the people. Participant 14 informed how the *Panchayat* from time to time organises meetings in which the farmers are taught about modern methods of farming to help them increase their produce in a sustainable manner. The most commonly used fertiliser is cow dung, as most of the households also own cattle and it is readily available.

#### Discussion:

The Forest Department as a whole puts a lot of emphasis on keeping the locals content; hence, the participants did not have any major grievances with the Park authorities in terms of land area. The only problem repeatedly brought up was the fact that wild animals, especially wild boars, enter their land holding and destroy their produce.



Trying to meet their food requirements from external sources rather than depending on their produce would prove to be very heavy for the locals. Their main focus is, as mentioned above, not on selling but on sustenance. For those who can produce surplus, it adds a source of extra income. Moreover, a small employment cycle develops when people who own farms employ others to guard the farm area or for labour purposes.

The area wise expansion of the National Park has not led to a decrease in farm holdings of the people but has also resulted in more opportunities for work being made available to them. Since eco-tourism plays a major role in increasing the name and the income of the Park, the people who were inherently farmers and small-wage farm labourers have moved out from their comfort zones and taken up jobs as tour guides and as members of the Forest Department. From February, when there is a lack of work in the agricultural sector until the onset of monsoons, these farmers do take up seasonal jobs elsewhere in the Park (Sawhney, 2003).

#### Conclusion:

Although there is self-reliance in terms of producing their own food, there are people who are unable to purchase grains because of both a paucity of money and produce (Sawhney, 2003). It is important to note that for locals who have inherently been farmers and are not educated or experienced enough in other fields of work, there are very few employment vacancies available apart from agriculture itself.

The problem of wild animals destroying their produce is one major concern which the farmers have had to face. To deal with this, they sometimes come up with fencing solutions which usually fail as the boars dig a tunnel from under the fence to reach the other side. The FD has been working vigorously to ensure that these problems are dealt with. Overall, the relationship of the farmers with the forest officials has mostly been smooth.

# Through the Lens of Policy



## **6.0 Through the Lens of Policy**

### **6.1 Guns**

BNP, originally, was a *Shikargarh* for the Rewa Dynasty of Madhya Pradesh under the colonial forest policies until the independence (Sawhney, 2003). By 1924, 255 tigers were hunted by various Maharajas in the surrounding forests of the Tala Region (Khandekar, 1982). In 1927, under the Indian Forest Act and Kanun Jungle Riyasat Act, the Tala Forest Block was declared as a reserved forest, which restricted hunting of fauna and felling of trees to a few species (Prakasam, 2006). By 1930, shooting or killing of gaur, leopard, and the tiger was forbidden. After independence, the Rewa State merged into the state of Madhya Pradesh, which brought changes to the rules and regulations of the management of the forest (Sawhney, 2003). The reserved forest was officially handed over to the state of Madhya Pradesh and was declared as Bandhavgarh National Park in 1965 with an area of 105 sq.km (Sawhney, 2003). It was notified under the MP National Park Act 1955 in 1968 (Sawhney, 2003). But hunting was allowed in the areas around the National Park (Prakasam, 2006). The relentless hunting in BNP drastically decreased the biodiversity of the area. “*We walked through the park area for two days just before its formation. We did not come across a single animal,*” said the former Child Welfare Warden of Madhya Pradesh. At the time of its declaration as a National Park, tiger population of BNP was only 25 (Khandekar, 1982).

### **6.2 The Shift**

A ban on hunting was fully enforced in 1972 after the introduction of the Wildlife Protection Act. These restrictions on hunting after the implementation of the provisions of the Act led to an increase in the wildlife population in BNP (Prakasam, 2004). With the increase in the density of tigers in the region, the ‘Predation Pressure’ on other animals increased. Predation pressure refers to the impacts on predators on the natural community of other animals, especially the animals preyed upon (Merriam-Webster, n.d.). By 1981, as compared to 1980, the population of barking deer reduced from 95 to 79, Chital went up from 1060 to only 1066, and wild boar declined to 147 from 235 (Khandekar, 1982). This pressure on the prey required an expansion in the area of the park. Three zones, namely, Khitauli, Magdhi and Kallawah were officially notified as part of BNP in 1982 (Sawhney, 2003). This increased the area of the park from 105 sq.km to 448 sq.km (Sawhney, 2003). In 1993, after Project Tiger was implemented in BNP,

the core area of 694 sq.km, including the Panpatha Sanctuary, and 437 sq.km of buffer area was included in the National Park (Sawhney, 2003). This increased the park area to 1579 sq. km (Sawhney, 2003).

Local communities have a day to day interaction with the forests and about three-fourths of the Protected Areas in India include human settlements within their boundaries (Kothari, 2000). People residing within and around protected areas were earlier seen as a liability by the government because they hindered the process of conservation (Sawhney, 2003). The local communities and the forest officials have always been in conflict regarding the protection of protected areas. This conflict of interests has caused various difficulties in the management of the protected areas. It is due to this reason that the government recognised the need for participation of local communities in the management of forests and introduced Joint Forest Management in the year 1990. This initiative was implemented by creation of various committees variably known as Van Suraksha Samiti or Village Forest Committee (Bhat, 2010).

As a result of the circular passed by the Ministry of Environment and Forests in 1990, Joint Forest Management was launched in 22 states. JFM aims to give agency to the local communities in the management of forests and to make them realise their duties to protect the forest (Bhat, 2010). In addition to Joint Forest Management, the forest departments also created eco-development committees which aim at improving the socio-economic conditions of the local communities (Kothari, 2000).

In BNP, 52 Eco-development committees were formed under the Govt. of Madhya Pradesh Resolution, which aimed at conducting welfare and development work in villages around Bandhavgarh(Prakasam, 2006). Under this resolution, the existing Joint Forest Management Committees were called Eco-development Committees. The members of these committees, along with the Forest Department created micro plans for the committee. These micro plans consisted of plans for the forest management as well as for the development of villages (Prakasam, 2006). The strategy behind the creation of these committees was to reduce people's dependence on the forests by providing alternative regular means of livelihood which primarily focussed on agriculture. Hence, the involvement of local communities in the management was used as a way to pursue the Forest Department's goals of conservation (Prakasam, 2006).

### 6.3 Cameras

Ecotourism was introduced in 2005 under the Madhya Pradesh National Forest Policy. It was promoted in BNP as a way to generate employment for the local communities whose previous livelihoods such as collecting NTFPs and rearing cattle conflicted with the conservation models followed by the park. In Tala, 62% of the local communities were involved in the ecotourism department working as various guides, safari jeep drivers, ticket collectors, and cooks etc. (Menon, 2012).

Tigers serve as the primary species in BNP that generate income from tourism-related activities including safaris for tiger spotting. “The guide at Bandhavgarh shared that it was important for him to spot a tiger for the group, since a guide is considered successful only if he has been able to spot out a tiger to the tourists” states the report by Equations, an international private research agency (Menon, 2012). Forest officials in BNP responsible for promoting tourism in the area explain that the funds generated by tigers are used for conservation-related activities to further improve the conditions of the park (Menon, 2012).

The Madhya Pradesh State Forest Policy, introduced in 2005, in the spirit of the National Forest Policy - 1988, aimed at achieving better management of the state’s forest resources for attaining better economic, social, and ecological outcomes (Madhya Pradesh State Forest Policy, 2005). This policy promoted the new approach of using employment under ecotourism as opposed to the earlier focus on agriculture as regular alternative means of livelihood for the local communities.

The core objectives of the policy included the creation of regular employment opportunities for families dependent on forests for livelihood. The policy sought to achieve sustainable use of forest resources in ways that would improve economic conditions of local communities. It reflected the push for a change in approach from viewing NTFP collection as an income generation activity for the government, to it being an activity to primarily support aspirations and social needs of local communities (Madhya Pradesh State Forest Policy, 2005).

Similarly, an increased focus was put on ecotourism as the policy aimed at developing ‘Ecotourism and Herbal-Health Tourism’ specifically for the purposes of benefiting local community’s dependent on forests, and for advancing conservation purposes.

To achieve the objectives of ecotourism development, the policy proposed strategies to partner with local communities to establish eco-tourism infrastructure like approach roads and interpretation centres, as well as train local villagers as guides to enrich tourist experience as well as provide additional employment (Madhya Pradesh State Forest Policy, 2005, p.21).

As per the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, forest dwelling scheduled tribes are entitled to the right to ownership as well as the right of access to collect, use, and dispose minor forest produce that they have been traditionally collecting from places located within or outside the village boundaries. This protects the right of tribes living in the forests, including in protected areas, across the country to collect and use/ sell non-timber forest products (Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006). However, reports have emerged that the implementation of these rights in protected areas across India was ‘non-existent’ (Kukreti, 2017).

## Conclusion

Policies have evolved over the decades and now recognise local communities as pivotal partners in the protection of wildlife. From the approach of penalising ‘trespassing’ in the protected areas, there has been a shift to provide limited and responsible access to local communities in the spirit that they are equal residents of the forests as well.

Thus, policies have incorporated the interests of the local communities and focus on improving their economic and social conditions. This is encouraged primarily through ecotourism activities that would directly link income generation opportunities to the success of conservation activities. This is done to align the incentives of all stakeholders and create positive attitudes towards conservation and ultimately improve conservation outcomes.

However, it is found that these policies do not always get implemented properly which leads to resentment among local communities as they do not witness positive impacts of conservation on their lives. Also, the overreach or insensitiveness of forest officials and guards towards the needs of the local communities lead to tensions between them hindering progress on the front of wildlife protection and conservation.

# Conclusion



The research focused on studying the evolution of conservation approaches and their sociological, economic and ecological impacts on BNP. All these aspects were researched upon, pondered over and evaluated, majorly by primary data collection and the on-field experience. Even before the on-field research began, it was clear that there was a glaring lack of secondary data present on Bandhavgarh. This gave birth to doubts about “Why such an important ecological area has barely any research conducted on it?” and “How has it managed to stay out of the limelight, in comparison to other national parks of India, when the tourist influx has increased over the years?”. A web search on Bandhavgarh produces multiple results about various lodges one can live in and safari expeditions one can embark upon in Bandhavgarh; but finding a paper discussing the gradual growth of BNP with the incorporation of the needs of the local communities, is not easy. The majority of the literature reviewed, apart from a dissertation by Puja Sawhney, was not centric to the study area of this research; instead, it was literature on other PAs in the country and a general study of policies and acts that have come into existence over the years.

The research in Bandhavgarh opened a new world of discoveries and realisations; from the local communities worshipping the tiger and accepting it as its own, to the forest department officials risking their lives on a daily basis to ensure the continued safety and health of the animals in the PA. As a PA, BNP has had its fair share of changes over the years. From the conservation policy earlier based on the colonial idea of commercial exploitation, it was realised that meeting the needs of the local communities and involving them in the conservation effort, as well as management, was important to ensure the survival of both forests and the animals. Plants, humans and animals have co-evolved; hence, they are inseparable owing to their interdependence on each other.

There are several constraints still present which should not be forgotten. The indigenous community faces issues in terms of meeting their demands for fuel, fodder, small timber, NTFPs etc. Their list of issues includes livestock grazing and killing, compensation and relocation, among others. But focusing on these issues, which are short-term problems, adversely affects the long-term goals of the Protected Area in terms of biodiversity conservation. Although this debate has been handled pretty well in Bandhavgarh, there is a need to get rid of these issues at this very stage for there to be an opportunity to grow.



Ecologically, the main complaints were that the wild animals, especially wild pigs, destroy crops. There were also concerns of attacks by other wild animals on livestock and humans. A viable solution which can be implemented is the construction of proper fencing around farmlands and villages; especially for the villages which lie close to the core zone. Compensation for livestock killing is provided readily, in most cases, but there is no provision for compensation in case of destruction of crops. This results in the development of hostility on the part of the locals towards both the animals and the forest department. This issue can be handled at this stage since it is not widespread or too intense. The Forest Department officials stationed at the gates or part of the patrol force complained about how they are not provided with adequate tools to defend themselves in case of an attack against a wild animal. Although these are rare since the animals have grown accustomed to these patrols and know that they are not going to be harmed, it is still a possibility. Regulation of forest cover should be monitored more closely as on the basis of GIS data collected, there were major changes perceived in terms of forest and water body cover over the years.

Sociologically, the local communities had grievances against the relocation policy. Many of the participants mentioned how the compensation given, which was around INR 10 lakh, was not sufficient. Village development should go hand in hand with the development and conservation goals of the Park. The locals want more policies to be implemented for the same. The Park management has to address both demands - that of the people as well as the PA. The increasing number of people and the cattle has disturbed the human to wilderness ratio which if not controlled will lead to overuse of the Park resources. The forest officials stated how their salaries and working hours should be revised. There were also reports of how some of the workers had not received their salary in over three months. A department official said that the management does not provide them with any benefits for their work. The work period of the lower level workers is not fixed; they are many at times stationed at a gate for a period of over six months with no leaves granted. The forest department officials are sympathetic towards the villagers; especially the ones who interact with the locals on a daily basis. They have established a good rapport with the locals and sometimes tend to turn a blind eye to small misdemeanours of a local.

Economically, Bandhavgarh eco-tourism gains immense weightage both by the locals and the management. Although a recommendation can be made that more employment opportunities should be provided to the locals under the aegis of ecotourism rather than those employed from outside the Park. Most of the participants understood the importance of conservation; for those who were not literate enough to have read about it, were also staunch in their belief that the tiger should be protected. This was a unique discovery; all were committed to the conservation efforts carried out. In terms of grievances, more opportunities for the women of the household to work need to be created. Tiger attacks on people usually occur when the people illegally enter the core area of the Park to collect NTFP's. Both these issues can be dealt with if the management would allow for the controlled and regulated collection of NTFPs. Since participants revealed that mostly (not always) the women of the house used to collect NTFPs, the setting up of a small cottage industry focusing on NTFP collection would not only provide the locals with extra revenue, but it would also be an opportunity for women become financially empowered. Emphasis also needs to be placed on educating the locals about conservation and why using firewood as a fuel resource is neither good for the environment nor for their health; they should be taught how to effectively use gas which is provided to them by the government but they do not use.

Much has been stated about balancing conservation and development; but how to make this a reality in a developing country like India? To achieve this objective, due importance needs to be given to a collaboration between public and private institutions both to enhance conservation in a equitable and long-term manner. Bandhavgarh has site-oriented and region-oriented social, economic and natural resource difficulties. The depleted status of the general forest area and the ever-increasing demand of the local communities may soon hamper the conservation strategies of BNP if alternatives to the same are not found and dealt with at the local level. Non-Governmental Organizations (NGOs) can go a long way in helping the conservation and development of BNP. While a few NGOs like the Corbett Foundation and the Wildlife Protection of India have extended their support, many more NGOs need to reorient their policies and funds towards this cause (Prakasam, 2006).

Bandhavgarh National Park is one of the most important tiger habitats of India; with local communities residing in the same region. The research on Bandhavgarh showed how it is

indeed possible for humans and wildlife to not only stay but also flourish while living near each other. The people, officials and locals alike, have taken upon themselves to ensure that the protection of animals of the Park is not hampered in any way. The few grievances present in the minds of the people of the Park are not unmanageable. If these problems are dealt with and harmoniously blended as a solution, a region-specific economic development policy can surely support the Park. Even though population and development pressures have and will force changes in the present policies pertaining to Protected Areas, developmental policies and practices should also try and reorganise themselves to incorporate biodiversity conservation with open arms.

The focus of the conservation policies in Bandhavgarh has not only been on sustainable development but also on regional development. This is a smart step because tigers today are in need of a preservationist approach for protection and regional planning fosters development between the Park and the communities living in it. The beauty of Bandhavgarh lies in the very fact that it has taken the concept of conservation and modelled it in its unique way. The Bandhavgarh model of conservation, which is albeit not entirely perfect at present, is still an approach which can prove to be successful in ensuring the harmonious survival of human and animals in the same area.

The research on Bandhavgarh revealed that contrary to common belief, local communities can peacefully co-exist with wildlife in protected areas. The story of Bandhavgarh has not one but two protagonists and is a story worth telling.

# FACES OF BANDHAVGARH



“

We are not saving the tiger for the tiger itself. We are striving to save the tiger in order to save ourselves.

”

- MR. MRIDUL PATHAK  
FIELD DIRECTOR, BNP



“

If there's one injured tiger, the whole forest department rushes for help... If a villager is killed by a tiger, very few people turn up for help.

”

- SHIVKUMAR YADAV  
FARMER, GARHPURI VILLAGE



“

What of the hunting, hunter bold?  
*Brother, the watch was long and cold.*  
What of the quarry ye went to kill?  
*Brother, he crops in the jungle*  
Where is the power that made your pride?  
*Brother, it ebbs from my flank and side.*  
Where is the haste that ye hurry by?  
*Brother, I go to my lair - to die.*

”

- RUDYARD KIPLING  
(CONVERSATION BETWEEN TWO TIGERS  
THE JUNGLE BOOK 1894)

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## NIGHT SONG IN THE JUNGLE

Now Rann the Kite, brings home the night  
That Mang, the Bat, sets free ---  
The herds are shut in byre and hut,  
For loosed till dawn are we.  
This is the hour of pride and power,  
Talon and tush and claw.  
Oh hear the call ! ---Good hunting all  
That keep the Jungle Law !

- By Rudyard Kipling  
(Inspired by the forests of Bandhavgarh)

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## Appendix

### Tables:

<b>TABLE 8 Human Injury/Kill Data During 1994-2004</b>				
<b>Year</b>	<b>No. of people injured</b>	<b>Compensation Paid (Rs.) (Injury)</b>	<b>No. of people died</b>	<b>Compensation Paid (Rs.) (Death)</b>
<b>Tala</b>				
<b>1994</b>	-		-	-
<b>1995</b>	-		-	-
<b>1996</b>	-		-	-
<b>1997</b>	-		-	-
<b>1998</b>	-		-	-
<b>1999</b>	-		-	-
<b>2000</b>	-		-	-
<b>2001</b>	-		-	-
<b>2002</b>	-		-	-

<b>2003</b>	-		-	-
<b>2004</b>	2			
<b>Magdhi</b>				
<b>1994</b>	1	500	-	-
<b>1995</b>	-	-	-	-
<b>1996</b>	2	1042	-	-
<b>1997</b>	1	500	-	-
<b>1998</b>	-	-	-	-
<b>1999</b>	1	500	-	-
<b>2000</b>	-	-	-	-
<b>2001</b>	-	-	-	-
<b>2002</b>	2	1229	-	-
<b>2003</b>	-	-	-	-
<b>2004</b>	2	3200		

<b>Kallwah</b>				
<b>1994</b>	-	-	-	-
<b>1995</b>	-	-	-	-
<b>1996</b>	1	3733	2	42000
<b>1997</b>	2	-	-	-
<b>1998</b>	-	-	-	-
<b>1999</b>	2	2172	-	-
<b>2000</b>	-	-	-	-
<b>2001</b>	-	-	-	-
<b>2002</b>	1	500	-	-
<b>2003</b>	-	-	-	-
<b>2004</b>	2	2243		
<b>Khitoli</b>				
<b>1994</b>	-	-	-	-

<b>1995</b>	-	-	-	-
<b>1996</b>	-	-	-	-
<b>1997</b>	-	-	-	-
<b>1998</b>	-	-	-	-
<b>1999</b>	-	-	-	-
<b>2000</b>	-	-	-	-
<b>2001</b>	2	-	-	-
<b>2002</b>	1	-	-	-
<b>2003</b>	2	18515	-	-
<b>2004</b>	1	6942		
<b>Panpatha</b>				
<b>1994</b>	-	-	-	-
<b>1995</b>	-	-	-	-
<b>1996</b>		-	-	-

<b>1997</b>	3	3317	-	-
<b>1998</b>	5	5545	-	-
<b>1999</b>	1	1782	-	-
<b>2000</b>	7	22556	1	20000
<b>2001</b>	1	1331	-	-
<b>2002</b>	5	17828	1	50000
<b>2003</b>	4	5880	-	-
<b>2004</b>	6	13692		



**TABLE 9 Cattle Kill Data During 1994-2004**

<b>Year</b>	<b>No. of Animals Killed</b>	<b>Compensation Paid (Rs.)</b>
<b>Tala</b>		
<b>1994</b>	-	-
<b>1995</b>	-	-
<b>1996</b>	-	-
<b>1997</b>	-	-
<b>1998</b>	-	-
<b>1999</b>	-	-
<b>2000</b>	-	-
<b>2001</b>	-	-
<b>2002</b>	-	-
<b>2003</b>	20	42800
<b>2004</b>	2	Rejected

<b>Magdhi</b>		
<b>1994</b>	9	5800
<b>1995</b>	4	2100
<b>1996</b>	2	700
<b>1997</b>	2	1700
<b>1998</b>	6	6500
<b>1999</b>	6	9000
<b>2000</b>	10	20200
<b>2001</b>	6	13300
<b>2002</b>	6	17500
<b>2003</b>	9	22000
<b>2004</b>	10	10500
<b>Kallwah</b>		
<b>1994</b>	6	3400

<b>1995</b>	4	1600
<b>1996</b>	4	3200
<b>1997</b>	4	3200
<b>1998</b>	10	10000
<b>1999</b>	5	11200
<b>2000</b>	6	12300
<b>2001</b>	6	12000
<b>2002</b>	15	44100
<b>2003</b>	7	15700
<b>2004</b>	32	102500
<b>Khitoli</b>		
<b>1994</b>	12	4800
<b>1995</b>	11	6600
<b>1996</b>	10	7900

<b>1997</b>	3	600
<b>1998</b>	7	3800
<b>1999</b>	16	13700
<b>2000</b>	8	18200
<b>2001</b>	1	3500
<b>2002</b>	19	31700
<b>2003</b>	25	90200
<b>2004</b>	25	67200
<b>Panpatha</b>		
<b>1994</b>	-	-
<b>1995</b>	-	-
<b>1996</b>	5	3400
<b>1997</b>	9	6800
<b>1998</b>	17	10300

<b>1999</b>	28	36600
<b>2000</b>	23	33700
<b>2001</b>	4	0
<b>2002</b>	18	4500
<b>2003</b>	39	86300
2004	77	140300

**TABLE 10 Poaching Cases Detected/Seized By The Park Management During 1994-2004**

<b>Year</b>	<b>Tiger</b>	<b>Leopard</b>	<b>Chital</b>	<b>Sambar</b>	<b>Others</b>
<b>Tala</b>				-	
<b>1994</b>	-	-	1*	-	-
<b>1995</b>	1	1	-	-	(wild pig & antler collection)
<b>1996</b>	-	-	-		2 (Barking deer & antler collection)
<b>1997</b>	-	-	-	1	1*
<b>1998</b>	-	-	1*	&	
<b>1999</b>	-	-	-	-	1(seized 10 bones of tiger)
<b>2000</b>	-	-	-	-	-
<b>2001</b>	1	-	-	-	-
<b>2002</b>	-	-	2	-	2 (Turtle & wild pig meat)

2003	-	-	2(1*+1)	-	1(Porcupine)
2004				-	1(Road hit case of a langur)
agdhi					
1994	-	-	-	-	-
1995	-	-	-	-	-
1996	-	-	-	-	-
1997	-	-	-	-	-
1998	-	-	-	-	-
1999	-	-	-	-	-
2000	-	-	-	-	-
2001	-	-	-	-	-
2002	-	-	-	-	-
2003	-	-	-	-	-

	2004	-	-	-	-	-
<b>Kallwah</b>						
	1994	-	-	-	-	-
	1995	-	-	-	-	1(Sambar antler collection)
	1996	-	-	-	-	1(Chital antler collection)
	1997	-	-	-	-	-
	1998	-	-	-	-	-
	1999	-	-	-	-	1(unauthorized entry)
	2000	-	-	-	-	1(antler collection)
	2001	-	-	-	-	-
	2002	-	-	-	-	-
	2003	-	-	-	-	1(Samber)
	2004	-	-	-	-	-



<b>Khitoli</b>					
<b>1994</b>	-	-	-	-	-
<b>1995</b>	-	-	-	-	-
<b>1996</b>	-	-	-	-	-
<b>1997</b>	-	-	-	-	-
<b>1998</b>	-	-	-	-	-
<b>1999</b>	-	-	-	-	-
<b>2000</b>	-	-	-	-	-
<b>2001</b>	-	-	-	-	-
<b>2002</b>	-	-	-	-	-
<b>2003</b>	-	-	-	-	-
<b>2004</b>		-	2	-	2
<b>Panpatha</b>					
<b>1994</b>	-	-	-	-	-

<b>1995</b>	-	-	-	-	-
<b>1996</b>	-	-	-	-	-
<b>1997</b>	-	-	-	-	-
<b>1998</b>	-	-	-	-	-
<b>1999</b>	-	-	-	-	-
<b>2000</b>	-	-	-	-	-
<b>2001</b>	-	-	-	-	-
<b>2002</b>	-	-	-	-	-
<b>2003</b>	-	-	-	-	-
<b>2004</b>	-	-	1	-	1 Blue bull, 1 Chinkara & 1 Barking deer

## Transcriptions:

### Forest Department:

#### CODE: F012

**Mridul Pathak:** First of all, I would like to introduce myself. I am Mridul Pathak, 1981-83 batch. I started my career as a pathologist and served in different departments. I joined as a demonstrator, Medical College, Gwalior. Then I got through Forest Services and I'm here since 1983 in Madhya Pradesh. Forest Department, actually, it has got 4 different wings. One is your territorial, which deals with the area, deals with the forest offences, its prosecution and plantation and management of the area. Second part of the forest department works with the production because whatever we are going to manage it should be in relation with the production of revenue which adds to the GDP. Anything which we are doing, if it doesn't add to the GDP, then it's worthless. So, second part of the forest department, it deals with the production. We calculate the timber production on the basis of rate of interest. Suppose we are having 100 hectare of land, which cost is suppose 1 crore then what will be the interest after 1 year. If it is 6% then his earning should be 6 lakhs. So whatever we are growing in the forest, it should not be less than 6 lakhs. If it is less than that then management of that forest is not profitable. So our second wing, it deals with the production and sale of the timber. Third wing is research and extension; in which we carry out different sort of researches like your wildlife management research your plants the different fast growing species, tissue culture, even now we are going for in-vitro fertilisation of several endangered species. And 1 unit is established at CCMB Hyderabad and another one is established at SFRA Jabalpur. We have spent near about 20 crores in Jabalpur and CCMB for generation of endangered species, for seed production as well as for the animal production. Few species which are not available in different areas that is also to be conserved. We'll discuss in later on regarding transportation of one animal from another. Some part of that translocation is related to the policy. Few species cannot be translocated and some other species can be translocated from one place to another place easily.

So here I'm heading wildlife wing of Shahdol District, Shahdol Conservancy Sambhavana. I have got my area distributed in 3 districts. Umaria, Katni and Shahdol. Total buffer area is handed over to us is 900 sq. km and 750 sq.km core area. Here we have just conducted bird watching camp from 1st – 3rd October that was first part of the wildlife week. And we got 112

species bird species in Bandhavgarh. Data is available and it can be provided to you also. As far as the other species are concerned, almost all endangered species of snakes and herbivores are available here. Even rattle and your stripped krait which is very rare in this area are available in this part. In regard to the birds it is Malabar pied hornbill is rarely available in Madhya Pradesh it is in plenty in Bandhavgarh because the area is nicely conserved with the help of local people as well as by the administration. Regarding management of the park, as we are coming to the wildlife part of forestry management we have got major 4 sections in wildlife management, one is your water management, second one is your grassland management, third one is your tree encroachment management tree management and fourth is wildlife management. Everything is related to each other, we have got different species which depends upon the different flora, fauna it total depends upon the flora. And I think all of you are well aware that there is a food chain which is meant for animals it is not for the flora. But that particular food chain it totally depends upon the flora available in that particular area. As for as for example if you'll go to spotted deer then you'll find that it depends upon the fine grasses only. It cannot chew your coarse grasses because it's teeth are smaller than other herbivores. While you will spot a Sambar you'll find that it is using fine grasses plus early stages of coarse grasses means just after rains you'll find that they are grazing chewing your coarse grasses also. As far as you will as soon as will go to other species like your Blue Bull and Gaur which is commonly known as Indian Bison you'll find that it depends upon the depends upon only coarse grasses. They cannot cut fine grasses from ground level. Because their mouth structure is different than other small herbivores. So we have got 3 herbivore species, one depends upon the fine grasses, another one is in between and third one is on coarse grasses. While we are having fine grasses as well as coarse grasses in our grassland. So we have to manage ratio between fine grasses and coarse grasses as we have got the number of herbivores. Ratio between Spotted Deer, Sambar and Gaur. In the same pattern we manage our grasslands. Suppose we have got 20 Gaur, 10 or 20 Sambar it makes 40 and 60 is Spotted Deer. Then we should manage our grassland in particular ratio that is 60% of the grassland should possess fine grasses, 20% is in between means coarse and fine grass mixed and 20% should possess your coarse grasses. Whenever you people talk about the coarse grasses it always grow with fine grasses, you cannot separate out. But as far as fine grasses are concerned you have to remove the coarse grasses from that particular area. Otherwise small animals like Spotted deer or other herbivorous species they cannot graze on that particular area. So we actually we measure our grasslands, count our wildlife population and maintain the ratio on grasslands. This is basically our grassland management. For management of grasses there are several

techniques and everyday there are some changes and which is based on the research conducted by SFRI or by the research institutes. Whenever you'll go for management of grasslands in early stages of the wildlife management grasslands were managed by early burning or hot burning means just after rains and before summer in winters we were burning grasslands and leave it for a particular period, close it for grazing and as soon as dew fall starts that area grows with the fine grasses and it will leave that area as it is without burning then the whole grassland will convert into coarse grassland because coarse grasses grow up then they suppress the fine grasses. To maintain that ratio in earlier stages we use to burn that area so that coarse grasses are suppressed and fine grasses can grow and it is available for the Spotted deer and the main population in all tiger reserves in Central India is Spotted Deer.

And anyway we were discussing about grassland management (electricity goes off here), in later stages some researchers found they that if we burn grasslands every year then fire resistant species of the grasses, they grow up which destroy the basic combination between palatable grasses. Because it will classify grasses in grassland then you will find two types of grasses one is palatable which is eaten by your herbivores and another one is unpalatable. Animals won't eat non-pelletable grass (Vo usko koi animal graze nahi karta hai). So in that particular stage when you'll find pelletable grasses are less and non-pelletable increases in that particular grassland. It is studied by one person two persons and they decided to retain the grassland as it is untouched for 2-3 years so that they can further decide about it. That research is still going on in Bandhavgarh in Pathan area where they created some plots and they will submit their report after 1 year that is in June 2018. But what happened when we didn't do this burning in our area then most of the herbivore they left the area. And they reached on the periphery and near village where they were doing agriculture. And they started crop eating(?) which resulted a lot of conflict between park authorities and villagers. So we decided last year that we will do some intervention in management of the grasslands. Because the problem was increasing day by day, most of our herbivores they were straying near the village and following that our carnivore they were also there. So people who were visiting Bandhavgarh they were not able to see tiger or herbivores because intention to enter in Bandhavgarh for most of the people not all is to sight a tiger. As soon as a person get that opportunity he want to leave this area very soon because in other areas tiger sighting is little difficult in comparison to Bandhavgarh and Tadoba. So in that particular situation they were not finding herbivores as well as carnivores and for that Mr. Tiwari, he supported me in that particular action and we took 5 grasslands which is in the centre of the park avoiding fire as well as overgrazing. What we did we brought a grass cutter machine, fixed it behind the tractor and we cut the coarse grasses just to promote

fine grasses by doing this action we also reduced the conflict between researcher and managers that they were saying fire is not good for the area every year and now they are not in a position to (ki hum fire use karne se degradation ho raha hai) the land is degrading because of the use of fire. But I submitted my 1 report that we are doing our we are doing that fire every year in our farmlands (?) and we are getting the same grasses there. Since the forest management has started means 1862 we are burning our farmlands (?) since 1862 and we are having good grasses in that particular area. It is not encroached by any fire resistant species or by such grasses which are not pelletable. Agreeing to our mission of that particular paper some researcher they came forward and they helped us and one part of the grassland was burned with the consent of research fellows as well as managers.

Simultaneously, what we felt that once animal leave any area then it doesn't want to come back to that particular area because either any animal leaves that area because of some threat or because of unavailable habitat proper habitat. So we again started searching the second reason we found that waterholes of this area is contaminated and we invited few pathology labs and Lal pathology they came forward they took near about 100 water samples and tested it they submitted report that water is contaminated and it is not suitable for animals. Major problem of water bound diseases was mainly restricted to the fawns means small herbivores just born new babies they were not chewing grasses and they were depending on the mothers' milk. As soon as they drink water their stomach is got their stomach got infected and they die because other bacteria has not yet entered in their stomach and they are not resistant enough. So mature herbivores they were killed by the carnivores and fawns they were not able to survive. So herbivore population gone down. Second challenge was to get good water then we made a research and found that there are few chemicals if which are added to water we can get better condition in water holes and it is very simple, everybody I think you know that potassium permanganate is the best available chemical to purify any water to remove bacterial as well as viral infection of that particular area.

You all are young so I don't think you all have ever gone for open wells, you people have started life with tube wells and direct water supply from different nagar nigam which are already treated but the senior person like Mr. Tiwari, me and other elder person they knew it when we were in villages and residing somewhere near forest then one Kotwar usually used to come to the village with a drum. And they started beating it that don't use this well's water because lal dawa is added. Potassium permanganate is known as lal dawa. So we took help of that particular medicine with \_\_\_\_\_ big pieces of \_\_\_\_\_(elem?) were added to the water holes, potassium permanganate plus its a little costly but \_\_\_\_\_. All 3 items were mixed

together added to water and after a week we found that number of the microbes which we were more than 1 lakh reduced to 40-100. And Lal pathology submitted report that this water is now consumable by human beings too. It is so good that if human being consumes this water there will be no infection. But they also suggested that this treatment should be done thrice in a year unless and until new rainfall occurs and the whole area is washed by rainfall means your flowing water. So this year we are again going to treat the waterholes, reason behind it that any animal which consumes that water, infected water carries bacteria in its stomach and as soon as it \_\_\_\_\_ the foetus?, that bacteria and viruses are spreaded all over the area. And during rains those infection came back to the original water source, during recharge. So this year we are again going to treat all our waterholes that is our second part of our management. One is grassland, which I informed you, second one is water hole management, third one is basic wildlife management.

What we found is these herbivores and carnivores, they were straying around the villages. There are 2-3 important villages like Gori, Gadhpuri, Damna, Ranchha, these villages are very close to the core area. And animals they go to the village not only they kill the cattle but they charge the human being also. Year before last year 14 peoples were killed by one tiger in \_\_\_\_\_(Some village name). And just adjoining to Bandhavgarh peripheral area and it is in Shahdol district. Not only that but in Bandhavgarh also more than 8 human casualties are recorded. Now there was another problem before the park management that we have to mitigate the human animal conflicts. For that when we conducted a survey we found 11 tigers near Gori, 7 near Gadhpuri and 9 tigers near \_\_\_\_\_ (Some village). And it was a big challenge to bring those animals back to the core area. Because herbivores they were straying out, carnivores they were straying there and they were getting easy food like buffaloes, cow, bulls, they cannot run fast while your Spotted Deer, Sambar and Blue bull, Gaur they run fast and they are able to protect their selves from carnivores up to certain extent. And this was the one process and another one that other cattle like buffaloes, cow, bulls, they don't run fast. So tiger has got 2 options, 1 either work hard, get a small animal or don't get bigger animal. So what we will choose if I'll say that don't work get 1 lakh rupees per month and do work get 50,000. What will you choose? Definitely I won't work and I want to have 1 lakh rupees. That was a option that was selected by the tiger also. So number of herbivores increased, number of tiger increased because of easy food but they were not inside the core, simultaneously human animal conflict goes to its peak. Mean killing of 14 person in 1 year in 1 national park, it is something very strange. And it is very difficult for the management to save the tigers if that level of conflict is there. We found our tigers near Shahdol, Chowri, Kathar, they are all revenue

villages far away from Bandhavgarh Tiger Reserve. Even they crossed the buffer and they settled outside and they were living happily because they were not worried, who was worried? The person who is living there, the resident of those villages they were worried and for that reason we got our 1 range \_\_\_\_\_ Khitauli in 2015. Villagers they came, one teacher, hostel care taker was killed by the tiger and it was third incidents and villagers they got collected, they burned the range office, they burned about 7=8 government vehicles. Private vehicles of the forest officers, they burned the residences of the forest officials, they burned whole \_\_\_\_\_, that was the level of agitation. Now there was a big problem to mitigate that conflict. When I joined at that time, 1 tiger, T-23 she was still staying near village boundary, very close to Khitauli range, that range which was burned by the villagers in 2015.

Then we planned how to manage it, first 2-3 months we managed our grasslands. Then we managed our waterholes, now the thing which was a target for us was to bring the animals back to the core area so that they can enjoy better grasslands and good water sources. We tried several attractive measures like we put some salt flakes in the area so that if any animal goes across it licks the salt then it will stay there. That is a technique in the department and it is a requirement because this area is sandy area, you might have seen the area. This area is sandy in nature. So all minerals they lease out in \_\_\_\_\_ (34:41) whatever is added by their tweekers or by their \_\_\_\_\_ it goes out and it supplements the agricultural field of the surrounding area not the Bandhavgarh tiger reserve. So the productivity of the land is going down day by day. For that we did grass cutting which converted into hummus? Added to the soil and very strange that after cutting the grass in that particular cutting we use one machine imported from Switzerland. It was provided by agriculture department, donated by department to BTR, it converts grass into husk, convert into small pieces and that is pelletable (I think he meant it can be eaten by spotted deer, but he said 'pelletable') by even spotted deer. It doesn't chew coarse grass but when coarse grasses are converted into husk then it is consumed by the fine grass eater. It was something new for us also, we were not expecting that result when we are doing it. But for bringing them back we started using crackers in villages. We put near about 100 crackers in Gadhpuri in all villages and instructed them to fire those crackers in between 6:00 evening to 11:00 PM because that is the most favourable time for the movement of the wildlife. So when they start putting crackers in that particular period animal will not enter into the village. And doing it for 6-7 days we didn't get the expected result. What happened, all the herbivores they went back to the core area but not a single carnivore. They didn't left the area. Because they have already selected 1 lakh rupees job without doing anything. They were dependent on cattle, they were not worried about the herbivores of the forest area. And putting



crackers in between 6-11 they avoided that period. And they started entering the village before 6 o'clock. They changed their timing, entered the village at 5-5:30 and so intelligent that they don't kill the animal when that it is in the forest area for grazing. They used to go to the village where that animal is tied in their sheds near the cattle area beside the houses. It is called sar here. And animals are kept in that particular sar and they used to tie because they don't want that their animal should go to the crop fields. So the animals are tied and tiger got that this is very simple technique he is getting tied animal just to enter that sar and will get an animal, kill it and drag it to the forest area. Now even after using that crackers we want that herbivores are in back in the core area but not the carnivores. So we used the old bits like Ramayana and everything and I suggested the villagers that now god can help us. So start doing Ramayan. It is continued for 72 hours. You know it know? Akhanda Ramayana it is called. Once it is started then it will be continued for 72 hours. In that we removed the Dholak and put the durms, finger drums. And the ropes are tied tightly so that it produces tann.. tan.. this type of sound and connected with a loudspeaker. So as soon as he puts his finger on the drum it produces a huge sound which appears like a bullet shot and it continued for 72 hours, tiger didn't enter because of that bullet sound and it is heard more than 4-5 km and they went back. And as soon as they entered the core area again they found the same habitat which they were needed. And they stayed there they didn't come back to the village. And human animal conflict is reduced to that level that since last 1 year we didn't have any human injury in BTR. It is fortunate in our part that we are not a single human injury is reported in BTR while it was 14,13,12 last 3 years. So this is how we manage our wildlife population just how we disperse the animal from troubled area to inviolate? Area.

Plus second part of the wildlife management is translocation. As you might have heard about the Panna Tiger Reserve it was gone to zero, not tiger. Similar at Sariska. Madhya Pradesh it is the first state we are translocated tiger from Bandhavgarh to Panna. We selected a mother tigress which has already bred, 1 litter is surviving. Because fertility is to be confirmed in any new area. We transported that female from BNP to Kanha brought one male from Kanha to Panna, one bear was left there and second year we found 3 more cubs means number was raised to 5 in 1 year. Then more females were transported from Kanha and male from BNP so that genetic ration could be maintained. Same you might have heard about Mandal's law of inheritance? There is a law called Mandal's law of inheritance. Character carries by the parent, will go to the offspring and there is a particular ratio. Mean if 1 male and 1 female produces any cub or any fawn it will carry all dominating character from father and dominating character of the mother. And dominating characters are like tall, tallness is a dominating character and

dwarfness is a recessive. In the same way black colour is dominating and fair colour is recessive. So they carry all dominating character of father as well as dominating character of mother. But they should not be contradictory. Means if father has got dominating character of tallness and mother is dwarf then offspring will be tall. That is the first generation. When it is breeds second time that is called F1 generation. In that the ratio is 3:3:1. First 3 will carry all the dominating character of the male, 3 all female and 1 we will have recessive characters. And F3 generation you will find 9:3:3:1. That is called Mendels he has more principles but what the important one is this one which we are using in the wildlife management.

So we brought different males having good character in Kanha, transported good females having all good characters like dominant strips, dark eyes, proper length of canine and their tooth size. Considering all these characters we transported animals to Panna Tiger Reserve. And that process is successful now we are having 37 tigers in PTR. Simultaneously in Bandhavgrah what we found that fine grass eater like cheetal, spotted deer and sambar they are in plenty. But coarse grass eater, which were here earlier, that was Gaur that was Indian Bison is extinct. Reason behind this was I think as far as my experience is concerned is water contamination is one of them and viral infection plus some people say that it migrated towards Amarkantak and they didn't come back. But for further planning we brought 49 Gaur from Kanha of different herds means herd 1 they remain in herds. And there is a one dominating bull and it is led by a female. Gaur group is always led by a female but dominating male it remains with that group for a period and it lefts. It remains solo. And we brought some dominant male, some dominant females and some calf. 49 number we brought and now fortunately we are having more than 150 Gaur in our Park.

Out of those 49 10 were \_\_\_\_\_ just to study about \_\_\_\_\_. That is the third part of wildlife management. Whenever we want to study any animal behaviour or we have to see about the changes in the generation or we have to make some researches then we have to use radio callers. And we get some strength finding also and Gaur we put 10 radio callers and for 3 years it worked perfectly later on it goes out of order. And observation was carried out by Gypsy and the team (that's what he says) and 1 WII researcher and she is still here she is working on Gaur population its migration and its establishment. But now we are having more than 150 Gaur population in BTR that's a great achievement in this park. Fortunately I was also part of that translocation at that time serving as Deputy Director in Bandhavgarh. That was a very typical experience and now we are planning to have more radio collars on Gaur as well as on Tigers. Because number of tigers are increased and our capacity to keep those tigers in core area or in buffer is less. Now we found that we are not capable of keeping that number of animals in BTR

especially tigers. So either we have to relocate those tigers or we have to plan it otherwise but since last 14 years we are not finding that tigers are not there, they are still there then where are the tigers gone? Suppose one pair gives 1 tiger actually there is ratio between male and female in wild that is 1:4. One male per territory it carries and four females per territory. And each female they used to litter 2-4 cubs at a time. So if we calculate the population of 4 tigers, suppose you are having 40 tigers then ratio will be 8:32. 32 females if they litter in one year, 2-4 taking average of 3 it will go to hundred. And next year 100 and next year 100. So we should have more than 400 tigers in tiger reserve within four years. But we are not having that. Where are those animals? So research was conducted and it was found that 80% is casualty. Mean out if 4 cubs only 1 or 2 will survive. Because of competition and because of survival of the fittest. The animal is fit, it will survive and weak it will go. But even then 400 by 20 means 80. 80 plus original 30, original 40 which should be 120 but it is not so. It means some of the tigers they left the area. That is called migration. And for that the department is fighting a lot to get corridors between all national parks. You might have heard about the corridors. Means all these separate independent populations just like population in Bandhavgarh is treated as meta population. Another meta population is at Kanha at Pench at Panna at Sanjay Gandhi. So these small patches where one population is there this 1 group of population is called as meta population. But survival of meta population independent meta population is not \_\_\_\_\_. You cannot continue with that particular population for pretty long period. You have to change the genes. Otherwise they will not survive. One infection will come to the area and every animal will die and the population will vanish. So now we are planning for the corridors also means all parks should be interlinked. But unless and until we get that we are translocating animals 1 male from Kanha to Bandhavgarh, 1 male from Bandhavgarh to Kanha, Kanha to Satpura Tiger Reserve, Satpura Tiger Reserve to Panna, Panna to Sanjay, Sanjay to Bandhavgarh, in that way we are rotating it. So that genetic balance will be maintained. This is basically what we are doing mainly for wildlife management in herbivore management, carnivore management. In herbivore management whatever is less in number it is added from other parks only for extinct species. If we are having viable populations then we are not transporting anyone. And viable population is 4xmale:female ratio. That in case of tiger 1:4. Means 5 is 1 group multiplied by 4, means 20. So if you'll go for tiger, if you are having 20 tigers then it is treated as a viable population. Means it is treated as a pretty long time because there are 4 genes whenever you will go from F1 generation, F2 generation, you will find variety. And one male will go to the other female group. Then automatically their gene transfer will be amended. And you'll find that that animal is still surviving. And as far as herbivores are concerned, it is not less than 50.

Means any animal if you want to rehabilitate in a new area you have to transport 50 animals. In Gaur it is calculated and 60-50, that is how we are managing our herbivore and carnivore population.

Another carnivore available here are panther, leopard, scavengers are also there like we are not having Hyena in good number but we have got wolf in some area, jackals as a scavenger. You have got a very good population of vultures also. Is the 3rd national park in which Vultures are breeding, they have created their own nest and their population is excellent in this park, it is the 3rd rank in India in Bandhavgarh. 1st is near Chandigarh, 2nd is near Oorcha? and 3rd one is Bandhavgarh

Last but worst part is man management is difficult. Everybody starting from the Chowkidar to everybody wants to enjoy the area without any restriction which is not possible. Want to throw everything, whatever is in their hands, don't want to keep it clean, want to spit, they want to do everything in the forest area which they have found it clean neat and clean and very decorative and we are finding it very good. They want to put something bad in that particular area, it is human nature. And we are also facing the same. We are trying to get rid of it, managing with the support of the police and all other offices also. Any questions? Then we will go for stories in the forest area. This is actually what we are doing, when you have come from different places then you should know about what the forest officers are doing and for protection, another part is protection, we are having our 9 ranges. 4 Sub divisional officer, 1 joint director, Mr. Mishra is here, and 4 SDOs under him, 9 range officers and 120 forest guards. The whole area is divided into beats, beats are controlled by the circles rangers, the person who is having 1 star and 2 star. Then that particular area is headed by a range, range officer, that bears 3 stars, then Sub Divisional Officer, that is called assistant director here. Next is joint director and I am senior most officer posted here, field director. This is the official status and area is divided and beat guard is responsible for beats. Everybody is responsible for this area. Any question?

Q. How is the relationship of the people with the forest department?

A. Relation of people with the forest department is not very good. It depends upon the officer who is posted there. As far as I will put an example, when I joined after 7 days, Viren (the police officer) told me that don't go to village Gadhpuri, they are violent and they will fight with you people and they will throw stones on your vehicle. As soon as you want to go to Gadhpuri, inform me, police force will accompany you. Otherwise don't go to the village. This was the first command given by Viren to me. Story I will speak in Hindi, I will better explain it.

I will narrate the stories in Hindi. I will be able to explain them better.

I left from here, I said to myself that I will make sure that I go to Garhpuri today! Before this, I had already served as the deputy director in the department. And there was an Adivasi man called Shiv in the village. His son, Santosh had been bitten by a bear. I took the child to Umaria which is also my headquarter. My mother was also with me. We tried to treat him but we realised that it won't be possible in Umaria. So we took him to Jabalpur, got him treated and brought him back. He was in 4th standard at the time. After we got him back, the doctor prescribed him medicines for a month to be taken thrice a day with Protein-X and milk so as to make sure his fat is reduced. So we brought him back to Umaria and 2-3 days later his parents got really keen on going back to their village. I said, "Sure, take the child with you. Here are the medicines." They said, "We don't think we manage this. You're taking really good care of the child, we've seen. We'll leave him here. We need to go back and start working on the fields. We need to plough the fields and plant seeds or we'll ruin the produce of the whole year." They left the kid with us and went back to Garhpuri village. Back there, they started their farming and we kept the child with us. I thought that, this way we'll ruin the education of the child. We employed a tutor. My son was also with at the time. We got the tutor to teach him [Santosh]. Now he finished his 4th standard studies in a month at Umaria. The tutor was a teacher at the central school. On the other hand, the master didn't bother going to the school at Garhpuri. We taught him for a month and a half. Once he was fit and fine, we bought him new clothes and books and dropped him back to Garhpuri. Later, we found out that he topped the 4th standard in his school. And he topped again in 5th standard too. Now when I went back to Garhpuri as Field Director, he was studying in 9th standard. I forgot the child and his father's name. No one remembers, even you won't remember if you were in my place. On my way to Garhpuri, there were 3 little girls sitting at the barrier [probably the barrier of the core area]. I asked them, "Where are you from?". They said Garhpuri. "Come sit in the car", I said. They hesitated. I said, "The people whom you're sitting with, the people who make you feel safe, work under me. **I'm not only their boss, I'm there father.** Don't worry." The guard at the barrier asked them to sit in the vehicle too. On our way to the village, I asked them about the boy who was bitten by a bear. They said, "Oh Santosh?!". I asked which standard is he in now. I asked the name of his father. They said Shiv. I got the information this way. Once we reached, we dropped the girls off at their houses. When they went inside, their mother came out. She asked, "Where did you get them from Sahab (sir)?" I replied, "from the barrier". She said okay okay. I said, "That's not enough. We haven't got them here for free. You'll have to pay the charges". Just to start a conversation. She said, "What charges can we pay sahab?". I said, "Just

get some nice tea". It was a Yadav family and we could see nice healthy cows. (Yadavs are known to rear cattle for milk and other products). She got us tea and we started talking. She said that a tiger had attacked her cow and there's a deep wound on its neck. "My cow will die", she said with resentment. There's always a first aid kit in my car. We used it to remove the pus from the wound. Until then people from Corbett Foundation also arrived. They treated the cow's wound with betadine and stitched it. They said that the cow will be fit in 6-8 days. Now, the woman got 4 other cattle to get treated. The people from the Corbett Foundation treated all of them. We finished the tea and entered the village on foot. The same village where we were warned that the villagers will pelt stones and destroy the vehicles! We arrived close to Shiv's house. We asked which one is Shiv's house. Now the girls of the village were came with us to take us to Shiv's house. Now, two girls of that village are walking in front of me. **Who'd dare pelting stones at me now.** The girls are their own daughters. No one would pelt stones. People were wondering why sahab was roaming around the village with the girls walking in front. Then we reach Shiv's house. Now the interesting thing was that, even though Shiv didn't recognize me, Santosh ran and hugged as soon as he saw me. I asked him, "How are you Santosh". "I'm good", he replied. He asked me when did I come and how long was I going to stay for. I told him that I've been posted here [at Tala]. He came with us to Tala, stayed for a day or two and went back. This made the department's access to the village of Garhpuri much easier. Just a small intervention was what was required.

Another problem village for us was Machkheda. Unfortunately, our guard's name there was Santosh too. He went to cut bamboo in the forest at 7 in the evening. He went there and never came back. We looked for him the whole night with no luck. The next morning, we found his severed hand and a piece of his leg. Two tigers had killed him. When our staff reached there, the situation went out of control. Three cars were pelted stones on, the SDO suffered a head injury and the Ranger was hospitalized. Then, I arrived on the location. Unexpectedly, four women of the village joined hands and came to my defence. "**No one will touch Sahab!**", they said. And I couldn't recognize those women. "No one will touch him", they repeated. They escorted me to an elephant and exclaimed that "Sahab will find the tiger and hold it captive". I got on the elephant, took my tranquillizing gun, went to the forest, tranquillized the tigers, put them in a cage and sent them off to Bhopal. Here I was wondering that in such a difficult situation where a man had been killed by a tiger, three cars were attacked, Ranger, SDO and many other forest officials had been hospitalized, how am I so lucky to get protected by those women. Later, I found out that one of those women was the wife of man named Ramesh and was the sister of Santosh's wife. Now the man who had died, his wife also protected me. "**Sahab**

**didn't eat my husband!**", she exclaimed. When I dug deeper, a small incident from the past came up. Initially, when I had joined as Deputy Director, I saw a lady crying before the deputy director on one of my patrols. I asked what happened to her. He said that her husband has been jailed and he hasn't gotten a bail yet, that's why she's crying. I asked him why had he been jailed. He said that the man had entered the park to cut *sarpat* grass (used to make broomsticks). There he saw a camera trap hooked up to a tree. He didn't understand what it was. He unscrewed it and took it home. He thought that some foreigner must've left it in the forest. Now the forest department started looking for it. While they were looking for it, they reached his house. They had sniffer dogs and everything. When the camera was found, they took the picture of the camera and saw the man cutting grass in the photos. The Ranger got really angry at the man for cutting grass inside the core area and, even more than that, stealing the camera trap. Everyone had one problem that he opened the camera trap and took it. What they did, they put all the sections of the constitution on him - habitat disturbance and that there were a couple of eggs of a bird also. They booked him completely under the Wildlife Act. Therefore, he went to jail. And when the court judge read habitat disturbance in the case against him, he rejected the bail application. After that, she went to the high court to appeal for bail. Now the high court will not grant the bail until the case diary of the alleged person doesn't reach them. Now the ball was in the forest department's court. Whenever the court would set a date for the case diary to be put up, the forest dept. would submit an affidavit stating that the Ranger is sick, here's the medical certificate. Now, the next date would be a month later. The man had to be in jail for another month. This continued until the man was in jail for four months. Meanwhile, they're crops got ruined. The lady with small kids had resorted to hand to mouth earning. And that's why she was crying. I asked the deputy ranger where the case diary was. "It's with the ranger", he replied. I said **"I want the case diary on my table by tomorrow morning"**. He said that the village is very notorious and whenever we go there, we get attacked. "We will not let the bail happen. Let him be in jail for 6 months". I said, "Ranger sahab, our job is to find offenses in the forest and file a case in the court. The penalty for the offense is for the court to decide, not us. **Let us not harass the public for no reason. This will make our relations worse.** Anyhow, the case should be in front of me tomorrow morning at 10:30. This is a strict warning otherwise I will place you under suspension". Now the case reached on my table the next morning at 10:30 and I sent the woman to the court with the case diary. I asked the government advocate of the forest department to not resist the bail as he had already been jailed for four months. The government advocate didn't press any charges and his bail was granted. She came back to our house at 6.30pm the same day. My mother again came back into the picture. "The

woman will not go anywhere in the dark. She has small kids with her. She'll stay the night here." I said, "She will not stay here in any case". (jokingly)

And finally, we managed to save both of our tigers. Otherwise the 10,000 people there at Manpur were armed with spears, guns and knives to kill the tiger. As soon as I reached there, they didn't even attempt chasing the tiger. They did as they were asked to do by us. They captured my field director but on one request to leave him, otherwise how will we capture the tiger, they left him. So the relations of the forest department with the local communities depend on the individual approach of each official. For some issues, the department has to manipulate the situation in one way or the other. Otherwise, for instance, every Navratri we keep *Kanya Bhojan* (feast for girl children) and call girls from 8-10 villages. It doesn't take much effort from us but really helps to maintain good relations between the forest department and the local communities. If we make an effort to maintain good relations with the villagers, they're very much agreeable. No one wants to become an enemy of the forest department. But the individual approach of the officials can affect these relations. For instance, when a tiger killed a man, one of our higher officials said, **"Why did he go there? It's the tiger's territory, not yours."**

Another interesting episode is of the Gata village. When a lady of the village went to pick tendu patta in the forest, she was killed by a tiger. 2011, 7th November, can't forget that date, 7th May actually. When we reached there, we saw the lady lay dead in the forest. The whole village gathered, about 5000 people. It was really tough to calm them. Meanwhile, this man, the brother of the sarpanch, came. His name was Shamsher Singh aka Sone Singh. That day, he his stomach was upset and had loose motion. He was addicted to Gaanja. He started smoking gaanja there and his stomach got even more upset and he wanted to go to the washroom. He took a mug and was ready to go the forest to relieve himself. I stopped him and said that "the tiger has just killed that woman. Don't go that side". The man said that "it has been an hour since that incident". I said we don't know how far the tiger must've gone. "Don't try and scare me sahab. If the tiger is *sher* then I am *Shamsher* Singh. What can it do to me?" He didn't listen to me, he entered the forest, crossed four rows of bamboo trees and sat down. And as soon as he sat, I saw a yellow stream through the wood and I realized that the tiger took the man. We took our vehicles and chased the tiger only to see the tiger hold Shamsher by his neck and drag him into the forest. And that was the other body which we kept beside the lady's body. We had brought one Post Mortem form with us and we had to call for another one. Meanwhile, another higher official of the forest department arrived. He asked, "The number of casualties were one how did it become two?". I narrated the whole incident to him. "Why don't you learn from your mistakes? Why did he go there!", he exclaimed. "Firstly, you aren't allowed to enter tiger's



territory then also you people entered to collect tendu patta in the forest and when warned not to go, you people entered the territory again", he yelled at the villager. This much was enough to fuel the fire. Somehow, we managed to calm the villagers down, finish the post mortem and send the dead bodies back. Now the higher official stressed on giving the compensation cheques to the families of the victims the very same day. He ordered for the cheque book from his office at Umaria. I asked him to let the situation cool down then we'll give the compensation cheques. "No no today! Right now!", he said. There was no other option. He said, "Give it to me! I shall go". I asked him to not go. "It's my suggestion, don't go". He was reluctant. He took both the cheques and reached the village at 6.30pm. At least 100 women and 200 men armed with spears, sickles and knives, surrounded him. **"Life for life", they said, "We don't need your cheque. We will cut you! We will kill you"**. They kept threatening him with the tools in their hands. They turned off the wireless of the vehicle, confiscated all mobile phones and cut off all methods of communication. Somehow, the driver found the opportunity to reach the car and contact us. He messaged that "sahab has been surrounded in the village and the people are armed to kill him". Chaos broke in the office and we rushed to the village. That time we were engaged in the task of Gaur relocation and electric fencing was being set up. When we reached we saw that all the women were armed with anything thhat they could find in the house. There are always toffees in my car and we distributed toffees amongst the kid. There are always toffees in my car and we distributed toffees amongst the kids. They said, "Sahab. don't try and get in the way. Let us settle the matter ourselves". I said, "Okay, we won't come in between. What will you do? You will kill him? You will cut them open? You're threatening him with all of these tools. You will be able to kill him?". "We're just scaring him", they said. "How will that help your cause?", I asked. "He won't come back here", they responded. Their intention was not to cause any harm whatsoever. They wanted to make sure that no forest official enter the village. I told them that it won't help them in any way. If another incident like this happens in the future, no forest official will be there to help them. "What will you do then?", I asked. Somehow, I managed to explain them that we cannot maintain our relations this way. I told them, "Just like you earn your livelihood through farming, we earn ours through working in the department. **Both the parties have different jobs. You farm lands to feed your children, we save tigers to feed ours**. We have the same objective that is to provide for our families. The conflict here can only be resolved if we sit and come to a conclusion in a calm manner. If we try to take an upper hand or if you try to take an upper hand, then the problem will never get solved". They understood it. "We won't take the cheque from his hand though", they said. "Don't take it from him. But let him go", they said. I asked him to hand over

the cheque to me and asked him to leave. "But you will be held captive!", he exclaimed. "We were the one who saved you, we won't get into trouble". He left and we gave the cheques to villagers and left. That problem was solved. There are many such incidents that aren't just human-wildlife but also human-human conflicts. **First of all, we need to mitigate human-human conflicts. As forest officials, if we think that we have the upper hand, the Tiger reserve protected with the Wildlife Act belongs to us and we can use all of these acts to exercise complete control over the park then we can't save a single tiger. As simple as that.**

If you do attempt to write the IFS exam after college, let me make one thing very clear, the powers entrusted upon you are for the management of the area and not for using everywhere. There's a very old saying that, only the tree that bears fruit bends down. If you are powerful, you must bend down. If the powerful keep exploiting their powers, then the conflicts will increase. If our dialogues with villagers are maintained, we will be able to preserve our relations. You ask me to go to any village in the Tiger reserve at 2 in the night, I will go. I have no issues with local communities. The reason being that they know that if I've come, I've come for help only and not to trouble them. The day the villagers realize that you stand by them and not against them, there won't be an issues. There are problems and they will continue to exist. As long as the tigers and humans occupy the same area, the human-wildlife conflicts will continue to cause problems. This is why, we're shifting the villages of the core area to outside the park in order to mitigate these conflicts. Relocation of certain villages from the core area have resolved some problems but it has some drawbacks too. No plan can be 100% satisfactory. **When villages were relocated, their cattle was relocated too. The prey base of the tiger reduced considerably.** Territories around villages where four tigers could survive can now feed only two tigers. Where will the other two tigers go? They will go to the villages where the cattle has been relocated. Therefore, we can only mitigate these conflict to a certain level. **The survival of the two is parallel. We need to create a balance between the two. The process is endless. No life is more valuable than the other. If a human life has value then the tiger's life has value too.** How many of you have a science background? 1,2,3,4, that's it?

Why are we conserving animals? **What is the need to conserve the tiger?** Why are we spending so much, fighting the villagers and risking the lives of people? What is the reason behind it? **The reason is that, every animal hosts several bacteria and viruses in its stomach, body and every other organ. We are a symbiotic structure. When your stomach is upset, you take 1,00,000 spores in the form of sporlac tablet as prescribed by the doctor. You grandmom says have curd to treat your stomach. Why? When Lactobacillus settles**

**back inside your stomach, your digestion starts working again. The same way, many bacteria support our circulatory system. The exchange of oxygen and carbon dioxide in the lungs is also supported by many bacteria. When we get infections, the quantity of these supporting bacteria in our body decreases. The same way, tigers cater many bacteria and viruses in its body the most important of which is Salmonella. Salmonella is responsible for the decaying of organic matter.** Tigresses never allow their newly born cubs to eat meat. Only when the meat is partially rotten by Salmonella, do the cubs get to eat the kill. This makes sure that Salmonella enters the cubs' stomachs. If any bacteria's host gets extinct, for instance, you've come here, where are you all having your meals? Assume that the people at Wild Haven run out of flour. What will you do then? Search for a new place? Yes. **If the bacteria's host gets extinct, it will search for a new host. This is called an alternate host. And the most susceptible alternate hosts are human beings. We stand second in the hierarchy. We aren't saving the tiger for the tiger itself. We are striving to save the tiger in order to save ourselves.** Today we suffer from so many diseases that originated from animals. For instance, bird flu. There are many other diseases that have no cure. We have killed the original hosts for many bacteria. But the bacteria viruses need alternate/secondary hosts for survival. The species which has the highest population is an appropriate secondary host. After flies, humans have the highest population for any species on Earth. Being very small creatures, flies cannot host these bacteria and viruses in their body. So the only body mass that is left, is of human beings. That's why we're running behind the conservation of the ecosystem. Plus, tiger is known as the umbrella species. Why? Because it gives shelter to us. Because of the existence of the tiger, we are protected from a lot of diseases. Anything else? Do you guys want listen to any other story?

Other than this, we also have rescue operations. Rescue operations are very exciting. There have been lot of episodes of such operations. Once we were notified at 3:30AM that a tigress was limping. I was placed at Umaria at the time. As soon as we got the information, we rushed to the location with medicines. We reached by 5AM. We started looking for tigress using a flashlight. We found her at about 5.45AM. She would try and gain balance with her fore legs and would fall off on her hind legs and so on. 15 minutes later, she fell near the chain link. We realized that it could take her life as well. We tried to touch her through the chain link. (the tigress was on the other side of the chain fence). As soon as we touched her, she'd resist by snarling furiously. 15-20 minutes later, she stopped responding in any way. We sent a few people to see where she had come from. They found out that she had vomited a few meters away. We collected a sample of the vomit. It smelled of Malathion which are essentially

insecticides used for crops. It is considered as a strong form of Phosphate poison. One spoon of Malathion is enough to kill a man. Being a biochemist, I could recognize the presence of the poison in the vomit. We decided that the tigress had to be treated. I told about the whole incident to my Chief Wildlife Warden at the time. He asked me treat her then and there. I told him that we had no medical help to treat the tigress. If you allow, I can try treating her. He was convinced that the tigress would die and asked me to do whatever I wanted. We turned the tigress, cleaned her mouth and used the antidote. The antidotes for the organo phosphate group are atropine and palm. Atropine is used as a dilating agent for the eyes. One injection of Atropine is just 2ml. The body weight of the tigress, however, was 250 kilograms. 5ml is required per body weight. That is 250 times 5ml! If we inject 1250ml Atropine, then it'll be able to nullify the effect of the poison. We just had 2ml injections of Atropine with us. Somehow, we managed to inject 1250ml of Atropine. Even then the tigress didn't respond. Then we decided to use Palm. Another one is adrenaline. After we injected adrenaline, we injected two 20ml vials of Palm. Still no response. But her respiration became smoother. A dying animal's rate of respiration can get very high. Normal breathing for a tiger is 20-25 breaths per minute. Her breathing rate was around 20-25 too. Even though her breathing rates were normal, she had no responses. We tried everything with no luck. We decided that there was no other way than washing her. Wash means increasing the volume of the blood in the animal's body so that the waste material is removed from the body. We took a 5 liter saline, hung it on a tree, prepared a drip and set up a cage. We decided to wash her while she was in the cage because if she gained consciousness in the process, it would be a big problem. We went to the other side of the chain link. We sealed its mouth with brown tape and tied a towel on it, blindfolded her and tied its fore legs and hind legs with thick ropes. Six people tried to lift the tiger. One of our young beat guards, Nanda, held her head. Our driver held the fore legs. I held her by the waist. The ranger held her hind legs and Manish ji held her tail. As soon as we lifted her, because of the shock she regained consciousness. Within seconds, the ropes on her fore legs and hind legs broke open. And she roared loudly. Nanda fell knocked out on the ground. Now the fore legs of the tigress were on either side of the waist of Nanda and her face right above that of Nanda. And then there was Manish, holding the tigress by her tail. And the tigress is fuming with anger and is ready to go. Somehow, we managed to get Nanda out of her way. Our driver, Rajkishore is scared of heights. If you ask him to climb a ladder and change the bulb, he'll feel dizzy. So we thought he wouldn't be able to climb the chain fence. We jumped to the other side of the fence. When we looked to the other side, we saw that two people were missing there - Manish (who was holding the tail and Rajkishore). Now Rajkishore who is

scared of climbing ladder climbed the steep and slippery Sal tree like a lizard. It was such a funny scene for all of us! This was the effect of adrenaline. Now when we saw Manish, he was still standing there holding the tail of the tigress. The tigress is moving furiously but he wouldn't let go of her tail. We were yelling at him to leave the tail. He couldn't comprehend anything. That is called brain off. We took along bamboo stick and hit him on the head to get him his consciousness back. Then he responded and we yelled, "Leave her tail or else she'll kill you!". Finally, he left her tail. We asked him to run. He ran towards the stone wall and jumped to the other side. There was deep pit on the other side full of water. That day I saw something very strange. A tiger always uses all of its five nails together to attack. However, that day the tigress used just one of its nails to cut open her blindfold. But she couldn't tear the towel on her mouth. So she wasn't in a position to charge. We set up a cage and held her captive for an hour to make sure she was healthy. And then we decided to leave her. Interestingly, the tigress decided to climb the chain link. We had 5 seater Bolero with a long open seat the back. On that one vehicle , there were 22 people. Everyone was scared out of their wits. We sent out a message to call for an elephant. Once the elephant came, I got on it. The elephant lifted the door of the cage and the tigress came out. She walked 20 meters, turned back, charged on the elephant and scratched is forehead. The elephant was very agile too. It used its trunk to put her down kicked her with its fore legs. Then she ran to the forest. We followed her for 6 days to make sure she had recovered completely. Later, no one had seen the tigress in 3 months. I was notified of the same. My wife and kids were with me too at the time. So we decided to go look for the tigress. We saw her lying in a water stream with half of her body outside. I thought that the tigress was dead for sure. Suddenly, she got up and climbed the hill opposite the stream. My wife was keen on waiting for her to come back. My son was zooming in and taking pictures. "Look papa, she's killed a rabbit", he exclaimed. We saw there was a tiger cub in her mouth. She kept the first cub, went back and brought 3 more cubs. 4 cubs in total. She lied down and started breastfeeding them. This was the first time these cubs had been seen. Maybe she wanted to show us that she had fulfilled her biological responsibility, she had repaid us for saving her life. Her present litter is her fourth litter.

**CODE: F008**

Q. Your name?

A. Satyaram Baiga

Q. What post do you hold here?

A. I am a chowkidar.

Q. Of the Tala region?

A. Yes, I do elephant's work.

Q. Elephant's work means?

A. Making roti for the elephants and preparing them to be taken to the forest. Then the Mahavats take the elephants to the forest and we rest here. When the elephant's are brought back we open their gear and give them roti again. Afternoon the elephants spend in the forest eating plants and stuff. Then again at three o'clock they come back and the we give them a bath and feed it eight rotis and one kg jaggery. Then again they leave later and come back in the night. When they come back again we clean the elephants, give them a bath then again prep them to be taken to the forest. This process goes on.

Q. Wow that's a lot of work for one day. How old are you?

A. Sir I am 40 years old

Q. Till where have you studied?

A. Sir, till 8th

Q. When I say Bandhavgarh National Park, what comes to your mind first?

A. I think that it's our Bandhavgarh. In our Bandhavgarh people from all over the world come and roam in gypsies and stay four-five days in a hotel. They take a room and stay there in the hotel. After three-four days of roaming the jungle they return to where they came from. They see tiger, bear, cheetah and everything else. It is easy to see also.

Q. How difficult is the work that you do here? What problems do you have to face?

A. I face a lot of problems sir. At four o'clock in the night I have to go into the core zone of the forest. There tigers, cheetahs, bears they are all there, anything could eat me and nobody would be there to do anything about it. If we are able to reach the elephant then we are safe and if we are not able to reach then the tiger could eat us and nobody would be there to do anything. Later on they would find out when they would realize that the person has not returned and then they send someone to find him. Then they would find the dead body there.

Q. Have incidents like this happened before?

A. Yes, incidents like this have happened before.

Q. Do they happen a lot or sometimes?

A. Sometimes. Like when I go to the jungle and a tiger finds me on the way and attacks me it can happen. There is a chain attached to the elephant that leaves marks on the ground. I just follow those marks, I don't look left or right I just go straight so a tiger could be sitting under a tree somewhere and sees me and attacks and kills me. There is nobody to see that for long distances.

Q. Do you have anything with you to protect you?

A. Yes an iron 'balam/bhala' is there. We attach a wooden stick to its end to make it longer.

Q. This was about you. Now regarding the park, do you think there are any problems faced by the park? Things that don't happen properly?

A. Here I don't get my salary from time to time. In four months I get one month's salary. Today it's been 15-20 years since I've been working in the forest. They give 6-7 thousand, not more than that. Very rarely if we complain a lot maybe in six months they add 150-200 rupees to our salary. They don't do anything more than that.

Q. Any reason for them not giving salary regularly? Have you complained to them but they don't listen?

A. I have complained but they don't listen. I've complained a lot but nobody listens. We are poor so we have to do work we don't have a choice.

Q. Are you aware of any hunting or poaching activities in the park? Like people from the village coming in and hunting or causing harm to the animals?

A. Yes it happens.

Q. What do they (villagers) do?

A. They go and tell the forest then.

Q. What do they (villagers) do?

A. The officials try to save the animal.

Q. What do the villagers do?

A. They shoot them with guns.

Q. The village people?

A. Yes, the village people.

Q. Any such incident that you remember?

A. They even put a rope around their necks and choke the animals. Sometimes they get their pet dogs to attack them.

Q. So these incidents are then reported to the officials?

A. Yes

Q. What happens then?

A. Then those people are caught and put in jail.

Q. According to you, do such issues like that that of people coming into the forest and harming the animals affect the attempts being made to conserve the animals?

A. Yes it affects those attempts.

Q. How is the relationship between the people (villagers) and the forest?

A. The relationship is okay

Q. So they don't have any complaints against you or you against them?

A. No no.

Q. So when incidents like these happen between the people and the officials how do the villagers react?

A. When the officials go to the villages then reactions are there.

Q. What talks happen? What do the villagers think and feel?

A. The villagers who do wrong deny that they do wrong. They cut the trees and kill the animals.

Q. Do the animals also go to the villages and cause harm to the villagers?

A. Yes, they do. They attack them and if they trouble the villagers again and again then the villagers come and tell the Forest Officials to control them. Till where will the management control them (animals). It's not cattle that you can tie up and keep.

Q. Do they (villagers) get compensation?

A. Yes compensation is given.

Q. Do you think that the compensation that is given is enough or more things can be done for the villagers?

A. More can be done sir.

Q. Do the villagers come in and take wood, tendupatta, Mahua, etc?

A. Yes, they do

Q. It's not allowed right?

A. It's not allowed but they come in illegally and take tendupatta, mahua and wood.

Q. Do they use it or sell it?

A. Some people sell it and some people use it.

Q. If you ever get to know of this or see it happening do you stop them?

A. Yes I stop them and tell them that don't come back after today. If they don't listen then I tell the officials that so and so person is not listening to me. So then we go and bring them to the forest and try to make them understand and all if not then they are punished.

Q. Are they fined or put in jail?

A. They are put in jail.

Q. All the laws that have been made regarding the forest and the people do you think they are enough and they work? Or do you think there is a need for more laws?

A. More laws should be made.

Q. The ones that are there are not adequate?

A. No, more laws should be made.

Q. Do you think there is problem with making the laws or implementing the laws?



A. There is a problem in making laws

Q. Are there any such incidents or any such issues that they (department) completely ignores and looks over?

A. Yes there are.

Q. What might those be about which you think they should do something about and think about more?

A. Some people are there sir that don't listen to what we say, they don't think about out problems they think about only themselves.

Q. They put themselves first?

A. Yes they put themselves first.

Q. So they should think about you as well and listen to you as well?

A. Yes they should.

Q. Whenever there is a new law formed, how are you informed about it? What are you told to do?

A. They just tell us that now this needs to be done this way. This work needs to be done here and that work needs to be done there and in this manner this needs to be made and in that manner that needs to be made.

Q. If you ever feel that what they are saying is not right then do they listen to what you have to say?

A. Yes they listen. I say that sir this work is not like this, this is wrong work. They'll ask then how is it and then I'll say that it's not from here it's from there. So then they listen to me.

Q. You are working here since so many years, what changes have you seen between when you came and now?

A. I have seen a lot of changes. Before it was something and now it's something else.

Q. What kind of changes have you seen?

A. It was good before now it's not good.

Q. Why is it not good now? Why do you say so?

A. There is nobody to look after our well being now. If something happens to me there is nobody to oversee that. For example, both my hands were broke because I fell off an elephant. So I put my own money to get myself treated. Before, they (officials) used to treat the workers and chowkidars on their own. There is a man who works here who hurt himself and broke a bone in the back. He is using his own money to get treated.

Q. Before the officials used to care and help now they don't?

A. no, now they don't.

Q. Why don't they do it now? You work for them they should be doing these things for you.

A. Sir, what happens now is that such officials come now that don't listen to us even though we are doing their work. Till today they haven't listened. Before also we were doing their work, now also we are doing. Before they used to listen, now they don't listen.

Q. Is it because new officials have come in?

A. Yes, new officials come and they don't listen.

Q. Over the years, has there been a change in the way the people view the forest and the forest officials? Has their viewpoint changed?

A. Yeah now they look at the Forest Department in a different way. Before they used to view it well now they view it differently.

Q. So now they think they are not good?

A. Yes

Q. What do you think about all the conservation efforts taking place to protect the forest and the animals? Do you think it should happen?

A. No no I think that these things must happen. This is where my earning come from, it should be saved.

Q. So all these efforts must go on?

A. We are eating the government's salt madam ji we will always side with the government.

Q. If you weren't working for the government would you still want these efforts to happen?

A. (laughs) Yes yes.

### **Local Communities:**

#### **CODE: P063**

Q: What is your name?

A: Ram Sundar Shukla.

Q: Which village do you live in?

A: Kuchwahi

Q: What do you do for a living?

A: Farming.

Q: How educated are you?

A: Very little, 5th class.

Q: What is your age?

A: 57 years.

Q: What is your caste?

A: Brahmin.

Q: How long have you been living near the park?

A: 2-3 generations of our family have been staying here.

Q: How many people are in your household?

A: 11.

Q: What is your household salary?

A: We earn from farm produce. We never really calculated our monthly income. We sell about 2-3 lakhs of Wheat and 2-3 lakhs of rice in a year.

Q: What challenges do you face due to your proximity to the forest and the wild animals?

A: The biggest problem is of the wild pigs. We don't have an issue with tigers. There might be an incident every 5-10 year, but it's very rare. Bears and tigers never really trouble us, the biggest problem is the wild pig.

Q: What are the problems with the wild pigs?

A: They destroy our crops. We carry our seeds and beds to the fields. Then only we can prevent the attack of the wild pigs.

Q: How do you think can this problem be resolved?

A: The government should grant loans to the villagers so that we can construct sturdy fences around each of our fields. The fence of the national park has been made by the forest department.

Wild pigs easily dig under the fence and enter the villages to consume the crops. If the authorities

help us, we will make our own fences that the pigs cannot cross. Crores of rupees have been granted for building the fence of the national park. But only 10-15 lakhs were spent on building the fence the rest went in their pockets. We are farmers. We have to bear the losses for this. If we

can get some help from the government, in the form of a loan not donation, then we can make our fences ourselves.

Q: Have there been any instances of tiger attacks on humans?

A: A tiger once killed a girl from our village. Her family were given 1 lakh rupees as compensation by the Forest Department. Two lodges in the park gave 50k each too.

Q: Can you describe the incident?

A: The tiger killed an ox and dragged it to the outskirts of the village. The girl went to the forest

to pick Mahua from the forest at around 2pm. As soon as the tiger started eating its kill, the girl

went where it had dragged its kill. The tiger attacked the girl. It charged towards her and attacked

her face with its paw. The girl died on the spot.

Q: The girl had entered its territory that's why it attacked. Otherwise the tiger doesn't attack?

A: No no, tigers never enter the village and attack humans.

Q: Any other incidents?

A: No, just one. In my life span of 57 years, there has been only one instance of a tiger attack on

humans, that of the girl.

Q: Are there any other wild animals that cause harm to the villagers?

A: No. The biggest problem is that of the wild pigs.

Q: You told us about your issue with the wild pigs. So, is there a samiti in the village that works with the government to resolve these problems?

A: Yes, there is a samiti but the head of the samiti is an Adivasi. What will he do? They are Adivasis. Why will they take interest? The officials came, got his signature and left.

Q: Why do they make Adivasi head?

A: We live in an Adivasi majority area. All benefits are reaped by them not the General category.

Q: But don't the Adivasis also face the same problems?

A: Yes.

Q: Why do they not work to resolve them? Because they have problems too.

A: Yes, they face the same issues too. They remain vigilant at all times. Also, they have small farms to look after. We have a bit larger field to take care of.

Q: What compensations do you get?

A: If there's an attack on humans and livestock, we get compensated. But we don't get compensated for the wild pig attacks on the fields.

Q: What steps do the forest officials take for your safety?

A: What will they do? Nothing.

Q: How has your life changed after the formation of the park?

A: There have been a lot of changes. We get electricity 24 hours. This year we don't get. But last

year, we had electricity throughout the day. Electricity and water two of the most important things in life. We have adequate water in our village. We use bore-wells for irrigation. We have

no issues with the formation of the park. Tigers dont cause any harm to us. The only problem is

the wild pig. As soon as it gets dark, they start entering our fields.

Q: A lot of people were asked to relocate after the formation of the park. Have you faced similar problems?

A: Nothing. See, revenue villages were not removed. Only, the forest villages were asked to relocate. If its a forest area, and people are have built 3-4 houses and have been living there for 10-25 years, its still the forest department land. They were given 10 lakhs each and asked to leave.

Q: Everyone gets compensated fairly?

A: Yes. Revenue villages havent been relocated. For instance, Garhpuri is a revenue village. When I was in 5th class, the process of relocation was going on. It still hasnt been relocated.

Q: Has there been any change in the size of your land after the formation of the park?

A: It hasnt changed. Its the same as it was passed onto us by our ancestors.

Q: Other than farming, does anyone do labour work from your family?

A: We collect Mahua from the forest. We arent able to collect tendu patta though.

Q: Are there any restrictions on collecting these?

A: No there arent an issues. Adivasis go inside the park, pick Tendu patta and come back. We dont go inside the park. Adivasis go pick Mahua and tendu patta in the park.

Q: Isnt it illegal?

A: It is. But when a forest guard is placed here, he lives in our village. What can one forest guard

do alone? There are 10 Adivasis and all of us. So we work together and go and collect these from

the forest. It is illegal to enter the park though.

Q: What happens if you get caught?

A: If were caught and we misbehave the forest officials then theres a court case against us. If youre polite with them, theyll let us go for cheap. It depends on our behavior.

Q: While coming here, we saw theres a lodge called Bandhavgarh Vilas. When therere so many lodges and tourists in the area due to ecotourism, do you face any problems?

A: No problems. They come, look around and leave.

Q: Do any of your family members get employment in such lodges?

A: Nothing. Adivasis get employed. If they employ people from outside, they pay them 7-10k. If

they employ the Adivasis, they pay them around 2-3k.

Q: What fuel do you use to cook food in the house?

A: Fuelwood and cow dung.

Q: Where do you collect wood from?

A: We get them from the forest.

Q: From inside the park?

A: No, not inside the park.

Q: After the formation of the park, a lot of villagers get employed due to tourism? Are there more employment opportunities now?

A: Yes, the Adivasis get employed. Who cares about the Generals? Were Brahmins. Who will ask us?

Q: Why such discrimination?

A: We dont give in to wrong deeds. We dont do anything wrong and we dont let others do wrong. IAS officers that come from outside, force people to work. Brahmins dont work under force. We dont bend. Thats why we dont get employed. If we tell that were Brahmins, we wont get employed. Not even in the park. The forest dept. wont employ Brahmins. If we go to the park ranger and ask him to employ us, he wont.

Q: Has this discrimination affected you?

A: Yes. There is discrimination. Adivasis will even clean their houses, light their stoves and wash their clothes. But Brahmins will not do any of this.

Q: What work has been done by the government in your village? For example, toilet construction

A: They have given funds for making toilets. All toilets of General category have been made. But Adivasis didnt make the toilets and took the money for themselves. Even if some of them made the toilets, they dont use them. They still go to the forest. Even if they government spends a fortune on them, these people will not improve. They will continue to live in filthy conditions. The government says that caste doesnt exist. How does it not exist? It is very much existent. Just

the way a cow and donkey are valued differently (cows are worshipped and donkeys arent), brahmins and adivasis are different. Caste exists. Caste exists in animals also. Caste is defined in nature.

Q: Where do you see this discrimination based on caste in your village?

A: Brahmins are the most discriminated against. We dont get anything from the government. According to them, Brahmin caste is useless. No matter if theyre rich or poor. Theres a Brahmin

in our village, hes very poor. On the other hand, there is an Adivasi. He is a school master. He also falls under the poverty line. He gets 50k as it is. The Brahmin is very poor but he doesnt get anything just because of his caste.

Q: Is there any discrimination in the distribution village resources on the basis of caste?

A: No, Adivasis have access to everything. They have been given land also by the government. When Shivraj Singh, he gave as much land to Adivasis as in their sight. If the Adivasi can see till a kilometer from here, theyll a kilometer long strip of land. Generals dont get any land. This is discrimination.

Q: What is the belief behind the tiger idols outside temples?

A: Thats lord Bagheshwar. We worship them. On Diwali, theres a special worship of the lord. The whole village assembles for it.

Q: Why worship the tiger though?

A: Because its Goddess Durgas vehicle. Also because it is our national animal.

**CODE: P073**

Q- What is your name?

A- Premybai, Daduram and Pinky prajapati

Q- Which village are you from?

A- We are from Bamera Village

Q- What work do you do?

Daduram- I do farming.

Q- Do you own any land?

Daduram- yes.

Q- Have you studied?

Daduram and Premybai- No

Pinky- I am studying in 9th grade right now.

Q- What is your age?

Premybai- 34

Daduram- 36

Pinky 16

Q- which caste do you belong to?

Daduram- prajapati

Q- How long have you been staying in Bandhavgarh from?

Daduram- Since birth. Our ancestors have been staying here for more than 300 years now.

Q- how many people live in your house?

Daduram- 6 people.

Q- What are the problems you face when you live so close to the jungle?

Daduram- we have a problem with the wild animals that eat our produce.

Q- you guys don't face any problems due to tiger attacks on humans?

Daduram- No. there haven't been any cases of tiger attacks on humans till now.

Q- if a tiger attacks, does the family get compensation from the government?

Daduram- yes.

Q- how much?

Daduram- around 1 lakh rupees.

Q- Does the forest department help you in protecting your crops?

Daduram- no.

Q- have you tried to ask for help?

Daduram- yes we have tried to ask for help, but they haven't responded positively.

Q- What kind of help have you asked for?

Daduram- we have asked them to fence our farm. But they aren't doing it.

Q- What other problems do you face by living so close to the jungle?

Daduram- We have a problem with the roads. There are no roads here. We aren't being able to go out of the village because of this. Children are also not being able to go to study. The village only has school till 8th grade. So children are being forced to drop out. The forest department is not providing us with any mode of transport. It is like we have been put in a jail.

Q- was it easier to commute before the park was made?

Daduram- yes. After the park was made, they have put restrictions and that's when all the problems started.

Q- Have you been asked to relocate by the government?

Daduram- yes we have been asked to relocate.

Q- how much compensation are they ready to give you incase you relocate?

Dadruam- they were saying that they would give us 10 lakh rupees to relocate. But we don't know how true it is.

Q- would you like to relocate by choice?

Daduram- if they give us good compensation depending on the acres of land we own, we are ready to relocate.

Q- Why would you relocate by choice?



Daduram- there are too many problems we have to deal with here. There are no roads, always threats of wild animals and we are living in a jungle. Hence I want to relocate.

Q- How are your relations with the forest officials?

Daduram- Not good. If an animal is in some problem, they will rush and come in no time. But if it's a human, they will never show up. They prioritize animals over humans.

Q- do you know why the government is pushing behind conserving tigers?

Daduram- no. We don't know why tigers are being conserved. According to us, they do it because the foreigners come to see these tigers and in the process, they live in lodges and they earn a lot of money throughout the year. Basically to earn money, they conserve tigers. We have no advantage by conservation of tigers. Tigers attack our cattle and sometimes attack people on the road as well.

Q- have the attacks increased after the population of tigers has increased?

Daduram- yes.

Q- do you do any work other than farming?

Daduram- I do masonry part time to build houses. We have no choice also. Even if we want to work outside, lack of roads limits us.

Q- Do you go to the jungle to collect non- timber forest products?

Daduram- yes we go to collect mahua and tendu pata. But it has been banned by the government. We go slyly.

Q- what happens if you get caught?

Daduram- they send you to jail.

Q- could you go and collect before the park was made?

Daduram- yes. Before we used to go freely.

Q- how was life before the park was made?

Daduram- Before the park was made, we could mover freely, collect as many NTFP's as we like and go out as well. If the government gives us some transport, then there is lot of future for everyone in this village. We have to go outside the village for small things like studying, getting the wheat to the mill etc.

Q- after the park was made, there have been many lodges and hotels that have come up. Has anyone got employment in these hotels and lodges?

Daduram- no. people from outside come and acquire jobs. We are always overlooked.

Q- why do you think that is the case?

Daduram- I don't know. If we ask them, they say we are full and don't need help.

Q- if you guys are given good compensation and you settle outside the jungle in a proper city, what work will you do?

Daduram- any work will do. I will do whatever is necessary to run the family. Ill do farming on someone else's farm for all it matters.

Q- what about people who don't own land and don't know how to do farming?

Daduram- those people will do labor jobs, become masons or start a roadside shop and sell something to earn a living.

Q- don't you think it will be difficult to find a job after relocation?

Daduram- no. it will be easy.

Premybai- if the government gives us roads and puts a fence around our farms, we will stop thinking about relocating and will live here happily.

Q- if these 2 problems are adhered to, then you wont want to relocate?

Daduram- absolutely. Why would we want to leave if there is no problem then?

Thank you so much

## Glossary

<b>S.No</b>	<b>Term</b>	<b>Definition</b>
1.	BNP	Bandhavgarh National Park
2.	BTR	Bandhavgarh Tiger Reserve
3.	Buffer zone	Areas peripheral to a specific protected area, where restrictions on resource use and special development measures are undertaken in order to enhance the conservation value of the protected area.
4.	Core area	Core area must contain suitable habitat for numerous plant and animal species, including higher order predators and may contain centres of endemism. Whilst realizing that perturbation is an ingredient of ecosystem functioning, the core area is to be kept free from human pressures external to the system.
5.	FD	Forest Department
6.	GIS	Geographic Information System
7.	Habitat	Area or natural environment in which an organism or population normally lives
8.	Habitat Fragmentation	Process by which habitat loss results in the division of large, continuous habitats into smaller and isolated ones
9.	IUCN	International Union for Conservation of Nature
10.	LPG	Liquified Petroleum Gas
11.	Megabiodiversity	Term used to refer to the world's top biodiversity-rich countries
12.	MFP	Minor Forest Produce
13.	NP	National Park
14.	NTFP	Non-Timber Forest Produce
15.	OBC	Other Backward Classes
16.	PA	Protected Area
17.	ST	Scheduled Tribes

