Human wildlife conflict around forest agriculture area

Thesis submitted in

Partial Fulfilment for

the Award of the Degree of

Master of Urban and Regional Planning

by

Vagadiya Dhruv Jaysukhbhai

Second Semester, MURP II - 2020 - 21

Primary Guide: Mr. Pradeep Rajput

Secondary Guide: Dr. Deepa Gavali

Master of Urban and Regional Planning (M.U.R.P.) Programme

Department of Architecture

Faculty of Technology and Engineering

The Maharaja Sayajirao University of Baroda

D. N. Hall, Pratap Gunj, Vadodara, Gujarat, India

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CERTIFICATE

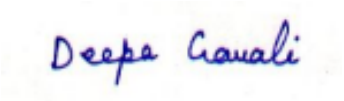
Human wildlife conflict around forest agriculture area

The contents presented in this Thesis represent my original work and it has not been submitted for the award of any other Degree or Diploma anywhere else.

Vagadiya Dhruv Jaysukhbhai

This Thesis is submitted in partial fulfilment of the requirements for the
Degree of Master of Urban and Regional Planning
at the Department of Architecture
Faculty of Technology and Engineering
The Maharaja Sayajirao University, Vadodara, Gujarat, India
The present work has been carried out under our supervision and
guidance and it meets the standard for awarding the above stated degree.

Primary Guide:
Mr. Pradeep Rajput



Secondary Guide:
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Abstract

Human-wildlife conflict (HWC) has increased globally because of an increase in the human population, particularly in developing countries. This study was conducted to investigate the status of HWC and the attitude of local communities to wildlife conservation around Talala gir ..Human-Wildlife conflict is a complex issue influenced by political and social attitudes, the biology of the species, and management actions .Effective management of conflict will have to strike a balance between minimizing serious conflict.

I analysed the escalating man-animal conflict due to changing cropping pattern in Talala sub-district on the periphery of Gir National Park and Sanctuary (GNPS), Gujarat, India. Sugarcane and mango cultivation has increased by 87% and 103% respectively within eight years from 1992 to 1999.In the year of 2001 The population of chital was around 750 and in the year of 2020 it increased around 1100. The straying of big cats from the GNPS to adjacent farmland has also led to increased encounters with humans. Out of a total of 13 attacks on people by lions, ten were reported from areas of sugarcane and mango cultivation. Of the total 25 leopard attacks, 59% (including four deaths resulting from the attacks) were recorded from farmland. Resent study show average 33% of crops are damaged by the wild animals (Chital ,Nilgai ,Monkey ,etc.) .After 2001 year to year tourist footfall is increasing due to promotion in the tourism by Gujarat gov. So the accident rate also increase because of the human wildlife conflict.

Acknowledgments

I would like to thank my esteemed guide –Mr. Pradeep Rajpoot Sir & Dr. Deepa Gavali mem for his invaluable supervision, support and tutelage during the course of my mater degree. My gratitude extends to the Faculty of Architecture for the funding opportunity to undertake my studies at the Department of Urban & Regional Planning, Maharaja Sayajirao University of Baroda. Additionally, I would like to express gratitude to Prof. S. Bhawana Vasudeva for her treasured support which was really influential in shaping my experiment methods and critiquing my results. I would like to thank D.F.O. of Gir paschim Dr. Dhiraj Mital sir & R.F.O. of Talala Mr. Dn Bhatt sir to give me a great knowledge of the great Gir national park. Spatial thanks to Forest officer Mr. Kashyap Mehta Sir to provide data for my work. My appreciation also goes out to my family and friends for their encouragement and support all through my studies.

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Chapter 1: Introduction

1.1 Background of study

The only free-ranging population of the Asiatic lion (*Panthera leo persica*) is found in the Gir Protected Area (PA), located in Saurashtra region of Gujarat state. The Greater Gir landscape which includes the current expanse of Asiatic lion range which extends across Amreli, Junagadh, Gir Somnath and Bhavanagar districts. Agriculture and animal husbandry is the mainstay of the economy in this region. Both these sectors have seen remarkable improvement owing to several schemes implemented through innovative Gujarat state government policies in recent times. The outcome of successful protection and management of Gir PA has resulted in growth in wildlife population within the PA on the one hand and on the other, changing cropping patterns, altered land-use and land encroachment at the PA boundary, has resulted in greater movement of both carnivores (lions and leopards) and wild ungulates outside the PA leading to situations of human-wildlife conflict.

The report discusses the positive and negative aspects of human and wildlife interaction both within and outside the PA and the varied priorities and approaches to conservation planning in either zone. Wildlife conflict in agro-pastoral landscapes outside PA impact both farmers and wildlife species causing financial losses leading to significant social and cultural changes resulting in transformation in conservation ethics and outlook.

The **Asiatic lion** is a Panthera leo leo population surviving today only in India. Since the turn of the 20th century, its range is restricted to Gir National Park and the surrounding areas in the Indian state of Gujarat.

The **leopard** (Panthera pardus) is one of the five extant species in the genus Panthera, a member of the cat family, Felidae.

The **chital** also known as spotted deer, chital deer, and axis deer, is a species of deer that is native to the Indian subcontinent.

The **nilgai** is the largest Asian antelope and is ubiquitous across the northern Indian subcontinent. It is the sole member of the genus Boselaphus.

Conflict: It takes place whenever incompatible activities occur. One party is Interfering, disturbing, obstructing, or in some other way making another party's Actions less effective (Deutsch,1973).

"Any interaction between humans and wildlife that results in negative impact on human social, economic or cultural life, on the conservation of wildlife populations, or on the environment." Is called **human wildlife conflict**.

1.2 Need of Study

Human-leopard conflict is a complex issue influenced by political and social attitudes, the biology of the species, and management actions (Athreya and Belsare, 2007). Effective management of conflict will have to strike a balance between minimizing serious conflict and the long-term conservation of the wild animals. Although the leopard is commoner and more resilient than other large cat species that occur in India, it is poached in the largest numbers to meet the demand of the illegal wildlife trade (Athreya et al., 2004).

In India, in the state of Gujarat, in the proximity of Gir National Park and Sanctuary and adjoining protected area (all together called as Gir Protected Areas or Gir PA), leopards (Panthera pardus). ,Lions use the extensive plantations of sugarcane and mango orchards to find shelter and water and to hunt prey such as buffaloes, cows, pigs and dogs. Leopards are a highly adaptable species that live in and around many human dominated, agricultural landscapes. They are reported to have strayed outside the Gir PA and into plantations and have chosen them as permanent habitat and started breeding in these cultivated fields.

On the periphery of Gir PA, it is reported that extreme and expanding conflicts with Wild animals are due to the rapid and extensive change in land use associated with the conversion of groundnut (*Arachis hypogea*) and great millet (*Pennisetum typhoides*) fields into sugarcane (*Saccharum officiarum*) cultivation and mango (*Mangifera indica*) orchard (Vijayan and Pati, 2001). Cultivation of sugarcane and mango plantations has increased manmade forests around Gir PA. This has allowed large felids and other wild animals to stray out of the protected area and find shelter here, leading to increased interaction with humans and cases of conflict. These crops create favourable habitats for Wild animals and play a major role in influencing the natural distribution and abundance.

Gujarat Forest Department has been facing the serious problem of depredation by Carnivores in Gir PA as well as in the other part of the state, which has unfortunately led to death of a significant number of persons in the last few years. These incidences greatly influenced the community's feelings and resulted in negative attitude towards the conservation of wildlife, especially the big cats. The occasional incidence of leopard predation on livestock had been accepted since

long but the leopard attacking human being changed the whole scenario. The leopard emerged as a symbol of terror for the communities on one hand, and on the other, tremendous hue and cry was made with demands for the elimination of leopards from area. The goodwill and trust of people especially in rural areas are vital to dealing with crisis situations arising out of loss of life and livestock by leopards. The Forest department is the first to face the heat of the public reactions and requires the goodwill and confidence of the rural community much more than any other government departments.

Lion population has shown consistent growth in the last 3 decades. Since 1995 it has been noted that lions have taken permanent residence in habitat patches outside PA. There has been a growth in this population as well to the extent that currently about 35% of the lion population exists outside PA . In recent times, the conversion of Gauchar, community, panchayat, revenue wasteland and forest lands into crop fields has resulted in increasing the pressure on forest for resources (Vijayan and Pati 2001). Lack of natural habitats in the buffer zones has deprived wild animals of refuge sites and therefore their movement in human habitations outside PA has also increased (Vijayan and Pati 2001). Thus, altered cropping from traditional crops like groundnut to mango and sugarcane -103% and 87% respectively within a ten year period – has increased interaction with people and wildlife at the interface areas thereby increasing the scope for conflict (Vijayan and Pati 2001).

Carnivore attacks, including attacks by both lions and leopards, on humans has increased. On an average about 22 such cases occur each year. Livestock losses to carnivore predation have also increased in the past decade both in terms of frequency of predation and the extent of predation incidents 36 from the PA boundary have increased. Wild ungulates chiefly Nilgai and Wild deer cause enormous losses to farmers due to crop raiding. Chital, Sambar, chinkara are also responsible for crop losses. In the entire periphery of Gir each taluka on an average lost about 34% of annual crop productivity due to feeding and trampling by wild ungulates. Conservation attitude surveys indicated that people consider crop raiding and crop loss by wild herbivores to be a bigger threat than risk posed by carnivores and economic loss due to livestock predation to the extent that many

considered presence of lions and leopards as important in checking the wild herbivore population.

1.3 Scope of study

In Gir PA, there is an extensive change (1990-2010) in land use pattern especially in the agriculture fields. The groundnut and great millet fields are now widely converted into sugarcane fields and mango orchards.

Wild ungulates chiefly chital & Nilgai cause enormous losses to farmers due to crop raiding. Sambar, chinkara, Monkey are also responsible for crop losses.

In the entire periphery of Gir each taluka on an average lost about 34% of annual crop productivity due to feeding and trampling by wild ungulates. Conservation attitude surveys indicated that people consider crop raiding and crop loss by wild herbivores.

Human-leopard conflict is a complex issue influenced by political and social attitudes, the biology of the species, and management actions (Athreya and Belsare, 2007). Effective management of conflict will have to strike a balance between minimizing serious conflict and the long-term conservation of the leopard. Although the leopard is commoner and more resilient than other large cat species that occur in India, it is poached in the largest numbers to meet the demand of the illegal wildlife trade (Athreya et al., 2004).

1.4 Aim and Objectives

Aim :- To understand the potential of human-wildlife conflicts in order to protect life, safety and security of animal populations, habitat and general biodiversity, and also to minimize damage to property.

Objectives :-

1. To find out Wild animal damage levels and other associated impacts.
2. Identification of different path of wild animals.
3. To understand the perception and level of tolerance of people living in the vicinity of wild animals habitats.

Chapter 2: Review of Literature

2.1 Literature on human wild life conflict

Bairam Awasthi (2015) This study tries to explore the status of Human-Wildlife Conflict (HWC) within the Gaurishankar Conservation Area (GCA), Nepal. The maximum damage of maize (39%) and potato (30%) crops were reported due to wildlife in the study area. Major wildlife pests were monkey, porcupine, goral, barking deer, jackal and Himalayan black bear. About ninety five percent of respondents reported crop damage problem was increasing in the area after GCA establishment. Fair and quick disbursement of compensation for crop loss and regular monitoring of the wild animal needed to be adopted to reduce human-wildlife conflicts. Change in cropping and crop composition, particularly cultivation of high value medicinal plants were also suggested. The findings suggest participatory approach to manage problematic animal species in GCA.

Meena Venkataraman(2016) The only free-ranging population of the Asiatic lion (*Panthera leo persica*) is found in the Gir Protected Area (PA), located in Saurashtra region of Gujarat state. The Greater Gir landscape which includes the current expanse of Asiatic lion range extends across Amreli, Junagadh, Gir Somnath and Bhavanagar districts. Agriculture and animal husbandry is the mainstay of the economy in this region. Both these sectors have seen remarkable improvement owing to several schemes implemented through innovative Gujarat state government policies in recent times. The outcome of successful protection and management of Gir PA has resulted in growth in wildlife population within the PA on the one hand and on the other, changing cropping patterns, altered land-use and land encroachment at the PA boundary, has resulted in greater movement of both carnivores (lions and leopards) and wild ungulates outside the PA leading to situations of human-wildlife conflict. The paper discusses the positive and negative aspects of human and wildlife interaction both within and outside the PA and the varied priorities and approaches to conservation planning in either zone. Wildlife conflict in

agropastoral landscapes outside PA impact both farmers and wildlife species causing financial losses leading to significant social and cultural changes resulting in transformation in conservation ethics and outlook. The paper emphasizes the need for all government departments to work synergistically to achieve common goals and optimize resources and planning. Agriculture department should share responsibility for reducing crop raiding menace by wild ungulates through support of research and technological innovation for mitigating losses. They should specifically invest in research in understanding behavior and ecology of these species so as to be able to eventually come up with scientific solutions to address the problem. These efforts could be in collaboration with the forest department. Providing relief to farmers would also benefit forest and wildlife conservation, and, in this case sustain local peoples' tolerance and empathy towards the conservation of endangered Asiatic lion.

Gemeda Do(2018) This paper is aimed to investigate the driving forces for human-wildlife conflict in developing countries in order to develop conservation strategies. Human-wildlife conflict has been occurring whenever an action by human or wildlife in a particular habitat. This problem has been in existence as long as wild animals and people shared the same resources. The expansion of human population into or near to areas inhabited by wildlife and modification of the natural environments for agricultural activities escalate human-wildlife conflict. The problem of human-wildlife conflict is frequently reported in developing countries in the form of crop raiding, livestock depredation, predation on managed wild animal species or killing of people. Crop damage is the most prevalent form of human-wildlife conflict across African continent. Hippopotamuses, baboons, rodents, grivet monkey, squirrels, porcupines, pigs, deer, elephants, spotted hyenas, leopards, and lions are some of the reported wildlife that affects community livelihoods in developing countries. Crop loss and livestock depredation by wildlife is contributing the problem of food

insecurity and poverty in developing countries. Human wildlife conflict hinders the conservation of animals in the natural habitats and poses the greatest challenges to the persistence and survival of wildlife. Therefore, all concerned stakeholders will work to minimize the existing human-wildlife conflict through developing human-wildlife conflict management techniques.

Human-wildlife conflicts (HWC) occurred when human beings take negative actions on wildlife and vice-versa. Conover (2002) defined the term HWC as occurring whenever an action by human or wildlife has an adverse effect on each other. Such conflicts have been recorded thought the world in terrestrial, aquatic, and aerial environments and have involved a wide variety of animal taxa (Torres et al.,2018). Primates and other wild animals are increasingly affected by habitat destructions and encroachments by human beings for various economic activities (Fourie et al., 2015). When contradictory situation appears between people and wildlife in the form of crop raiding, livestock depredation, killing of people leads to HWC(Woodroffe et al., 2005).The issue of HWC is not a recent phenomenon. Human wildlife conflict has old as old as human civilization, yet currently the phenomenon poses a serious environmental challenge and has been escalated over the past few decades (Anand and Radhakrishna, 2017). Human-wildlife conflicts have been in existence as long as wild animals and people shared the same resources. Sharing and completion for limited resources will leads to HWC. Crop-riding by wild animals is a common problem all over the world (Fenta, 2014; Gandiwa et al., 2013; Gandiwa et al., 2012; Kate, 2012; Gusset et al.,(2009). This conflict is worsening in areas where humans and wild animal's requirements overlap (Gandiwa et al., 2012). The conflict is occurring everywhere in the world. Although, the problem of HWC is exist everywhere, the situation is more severe for Africa continent where majority of the people depends on agriculture, which accelerates the conversion of wild habitat to agricultural fields (Kate, 2012). Crop damage is the most prevalent form of HWC across African continent (FAO, 2009).The expansion of human population into or near to areas inhabited by wildlife and modification of the natural environments for agricultural or other economic activities escalate HWC (Hockings and Humle, 2009; Knight (2000). Natural forests are being cleared and the primates are facing great challenges.

HWC mitigation is crucial for conservation of wildlife (Ogra and Badola, 2008). Residential and commercial development, agriculture and aquaculture expansions into forest areas are the main challenges that affect the life of wildlife. Understanding drivers of HWC is a prerequisite for developing effective and cost efficient conservation strategies. This paper is aimed to investigate the driving forces for human-primate conflict and to support policy makers and conservationist.

Avdesh Bharadvaj(2017) Human–wildlife conflict refers to the interaction between wild animals and people and the resultant negative impact on people or their resources, or wild animals or their habitat. The paper discusses the occurrence of human-wildlife conflict, when growing human populations overlap with established wildlife territory, creating reduction of resources or life to some people and/or wild animals. It also highlights about the conflict that takes many forms ranging from loss of life or injury to humans, and animals both wild and domesticated, to competition for scarce resources to loss and degradation of habitat. People lose their crops, livestock, property, and sometimes their lives. The animals, many of which are already threatened or endangered, are often killed in retaliation or to 'prevent' future conflicts. It is one of the main threats to the continued survival of many species in different parts of the world, and is also a significant threat to local human populations.

Human-wildlife conflict is fast becoming a critical threat to the survival of many endangered species, like wild buffalo, elephants, tiger, lion, leopard etc. such conflicts affect not only its population but also has broadened environmental impacts on ecosystem equilibrium and biodiversity conservation. Laws are man-made, hence there is likelihood of anthropocentric bias towards man, and rights of wild animals often tend to be of secondary importance. But in the universe man and animal are equally placed, but human rights approach to environmental protection in case of conflict, is often based on anthropocentricity. Wildlife-human conflicts are a serious obstacle to wildlife conservation and the livelihoods of people worldwide and are becoming more

prevalent as human population increases, development expands, and global climate changes and other human and environmental factors put people and wildlife in greater direct competition for a shrinking resource base. Conflicts between wildlife and humans cost many lives, both human and wildlife, threatens livelihoods, and jeopardize long-term conservation goals such as securing protected areas and building constituencies in support of biodiversity conservation. Human-Wildlife Conflict is any interaction between wildlife and humans which causes harm, whether it is to the human, the wild animal, or property (Property includes buildings, equipment, livestock and pets, crops fields or fences).

Some examples of human-wildlife conflict include: ·

Predation on livestock or domestic animals by wildlife.

Ungulate damage crops and fences.

Flooding caused by beavers.

Wildlife strewing about residential garbage.

Squirrels or bats in home attics.

Birds nesting in undesirable residential locations.

Vehicle/wildlife collisions.

Man-animal conflicts are common in various parts of the country. In India, wild elephants probably kill far more people than tiger, leopard or lion. But, surprisingly, human conflict involving leopard draws great amount of public attention compared to other animals. Other carnivores -tigers, lions and wolves, which have been known for causing a large number of human deaths in the past, are now mostly restricted in range and their impact is not as widespread as that of the leopard. The key reasons for human-animal conflict are encroachment of human being in wildlife habitat for development purpose & survival purpose as well as allowing livestock for grazing purpose in the forest area, forest fire. This conflict leads to loss to both human & animal. The result of this conflict is severe which result into the loss to crops of farmers and decline in wildlife conservation as well. Among these the human –leopard conflict is

common in many States. The incidences of killing of leopard by public have been hitting headlines of news media along with or their poaching. It is a challenge to ensure the peaceful coexistence of leopards among high densities of humans Research indicates that even in such high human density areas, attacks on humans and domestic animals in most cases can be kept to very low levels. Conflict with wildlife may be due to the abnormal behavior of wild animals like aggressiveness of monkey, cattle lifting by carnivore, injury by bears during Mahua season etc. Development of people is always welcome but not at the cost of negative ecological aspect in the ecosystem. Development activities causes more interference in forest and also the privacy of wildlife and these ultimately cause conflict with wildlife. Man-animal conflict often takes place when wild animals cause damage to agricultural crop and property, killing of livestock and human beings. Human population growth, land use transformation, species loss of habitat, eco-tourism, too much access to reserves, increase in livestock population bordering the forest, depletion of natural prey base etc., often stated to be reasons for such conflict. Central Govt. the State Governments, and the Union Territories should evolve better preservation strategies, in consultation with Wildlife Boards so that such conflicts can be avoided to a large extent. Participation of people who are staying in the Community Reserves is also of extreme importance. Environmental justice could be achieved only if we drift away from the principle like sustainable development; polluter pays principle, precautionary principles which are based in the interest of humans and environment. Ecocentrism is nature centered where humans are part of nature and non-human has intrinsic value. In other words, human interest does not take automatic precedence and humans have obligations to non-humans independently of human interest. Ecocentrism is therefore life-centered, nature-centered where nature includes both human and non-humans.

Upma Manral(2016) In a developing economy like India where majority of human population depends heavily on natural resources, the forest-dwellers have co-existed with the wildlife for long. However, the growing human dependency on natural resources and degradation of wildlife habitats, have resulted in a conflicting situation between humans and wildlife, and authorities involved in wildlife management. With significant conservation and economic consequences, human wildlife conflict (HWC) undermines well-being of both the parties and threatens the conservation goals. It impacts the people's food security and livelihood and psychosocial wellbeing. We reviewed articles that deal with monetary loss incurred by involved communities and discuss the effectiveness and the short comings of measures taken to address the issue and prevent the loss, in the Indian scenario. There is a lack of studies dealing with monetary cost associated with HWC and no realistic estimates are available for involved species. Majority of the studies are from protected areas with un-protected forests represented poorly. It is imperative that action plans, which target offsetting economic loss of locals and enhance public participation, are put in-place to meet the integrated conservation and development goals in a landscape where human and wildlife can coexist.

Human - Wildlife Conflict (HWC) is defined as 'interaction between humans and wildlife where negative consequences, whether perceived or real, exists for one or both the parties when action of one has an adverse effect on the other party' (Conover, 2001; Decker et al., 2002). It has been in existence for as long as wild animals and humans have co-existed and shared the same resources. Historical records from Nile Delta revealed that hippopotamuses raided crops while crocodiles attacked livestock in Egypt while elephants had been raiding crops all across Africa and other parts of world (Barnes, 1996). The famous “Taung skull” discovered in South Africa in 1924 belonged to a child victim of an eagle attack that occurred some two million years ago (Berger, 2006). Such conflicts have negative impacts on conservation of wildlife populations or of their environment; and social, economic or cultural life of humans (WWF, 2005). The negative consequences for local communities include attacks upon humans (Löe and Röskaf, 2004; Packer et al., 2005; Jadhav and Barua, 2012), depredation of livestock or game (Thirgood et al.,

2005; Banerjee et al., 2013), destruction of stored harvest or crop-raiding (Pimentel et al., 2005; Perez and Pacheco, 2006; Karanth et al., 2012) and spread of zoonotic diseases to humans or stock (Daszak et al., 2000; Singh and Gajadhar, 2014; 2015). At times people have to make lifestyle choices and bear opportunity costs due to presence of wildlife or protected areas (Woodroffe , 2005; Barua , 2013). Species involved may vary from grain eating sparrows or rodents to man-eating tigers; affecting from marginal agro-pastoralists of developing countries to elite section of developed world. Consequences are no better for wild species which bear the brunt in the form of retaliatory killing and lethal control (Liu et al., 2011; Mateo-Tomás et al., 2012; Northrup , 2012; Bergstrom et al., 2014). The intensity of the problem is increasing because of a number of factors such as increase in human populations, anthropogenic encroachment into wildlife habitats resulting in transformation of wildlife habitats into urban and sub-urban areas and agrarian ecosystems and fragmentation of wildlife habitat causing constriction of wildlife populations into marginal habitat patches (Siex and Struhsaker, 1999; Conover, 2001; Sillero-Zubiri and Switzer, 2001; Nyhus and Tilson, 2004; Hegel, et al., 2009; Estes et al., 2012; Yadav , 2012). Recovery of declining populations of many large mammals due to efficient wildlife management and large network of protected areas worldwide has also lead to increased conflicts (Saberwal et al., 1994; Fall and Jackson, 2002; Vijayan and Patil, 2002; Woodroffe et al., 2005). Stochastic events such as fire and climatic change also augment conflict situations e.g. higher number of cases of livestock depredation by wild predatorsduring seasonal rains in Kenya while during dry season in Zimbabwe (Butler, 2000; Nyhus and Tilson, 2004; Patterson et al., 2004).

Chapter 3: Research Approach & Analysis of the study

3.1 Study Area Selection

In the 19th century, the rulers of Indian princely states used to invite the British colonists for hunting expeditions. At the end of the 19th century, only about a dozen Asiatic lions were left in India, all of them in the Gir Forest, which was part of the Nawab of Junagarh's private hunting grounds. British viceroys brought the drastic decline of the lion population in Gir to the attention of the Muslim Nawab of Junagadh, who established the sanctuary. Today, it is the only area in Asia where Asiatic lions occur and is considered one of the most important protected areas in Asia because of its biodiversity. The Gir ecosystem with its diverse flora and fauna is protected as a result of the efforts of the government forest department, wildlife activists and NGOs. It is now considered the jewel of Gujarat's ecological resources.

Besides Africa, Gir National Park in Gujarat is the only place in the world where you can spot lions roaming free in the wild. The real discovery channel of India is situated approximately 65 Kms South East of Junagarh District. The Government notified the large geographical extent of Sasan Gir as wildlife sanctuary on 18th September, 1965 in order to conserve the Asiatic Lion. It covers total area of 1412 square kilometers of which 258 Km forms the core area of the National Park. Indiscriminate hunting by the people of Junagarh led to their decrease in population drastically, while they were completely wiped out from the other parts of Asia. It was the kind effort of Nawabs of Junagarh who protected the queen royalty in his own private hunting grounds. Later in due course of time Department of Forest Officials came forward to protect the world’s most threatened species. From a population of approximately 20 lions in 1913, they have risen to a comfortable 523 according to 2015 census. There are 106 male, 201 female and 213 sub-adult lions in the wilderness of these four districts.

I have selected Talala forest boundary from the Gir PA.

- Area - 979.89 sq.km .
- District - Gir Somnath
- Coordinates - 21.09266,70.56636
- Eco system - 1) Dry deciduous scrub forest
  2) Dry savannah forests

3.2 Data Collection

1) Primary data collection
   I. Reconnaissance survey:- To explore site conditions and availability of infrastructures.
   II. Direct observation
   III. Use of diagram and picture

2) Secondary data collection

   Research reports

   Journal article

   Literature review

   Electronic media Book,

   Talala Forest Department

   Sasan forest department

   Talala agriculture department

No table of figures entries found.	Crop types	Average damage per year per HH (20kg)	Economically Average annual damage per year per HH (Rs)	Total damage per year (20 kg)	Total damage in term of money(Rs)
1	Corn (2 times per year)	244.5	5868	18093	1434232
2	Sesame	148.7	4014.9	11003.8	1297102.6
3	Ground nut	124	1984	9176	2146816
4	Chickpeas	141.6	2241.6	10478.4	3167654.4

Table 1 Extent of wild animal destruction in term of area and money

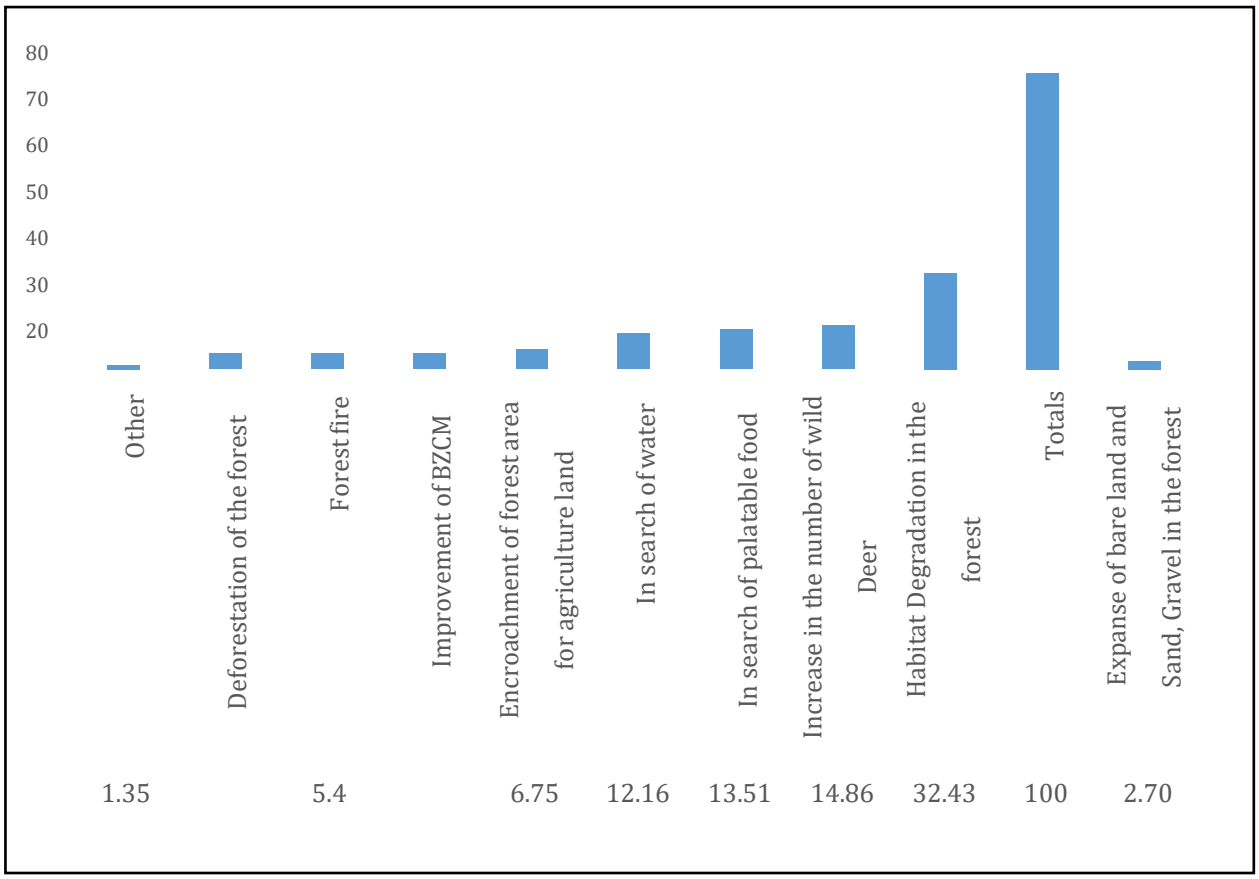


Table 2 perception of people about arrival of wild animals

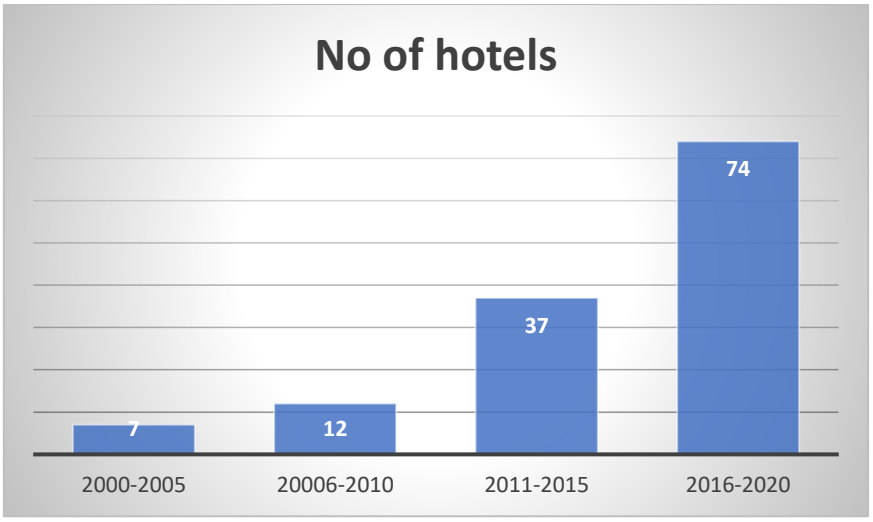


Table 3 No of Hotels

Table 4 Touries footfall

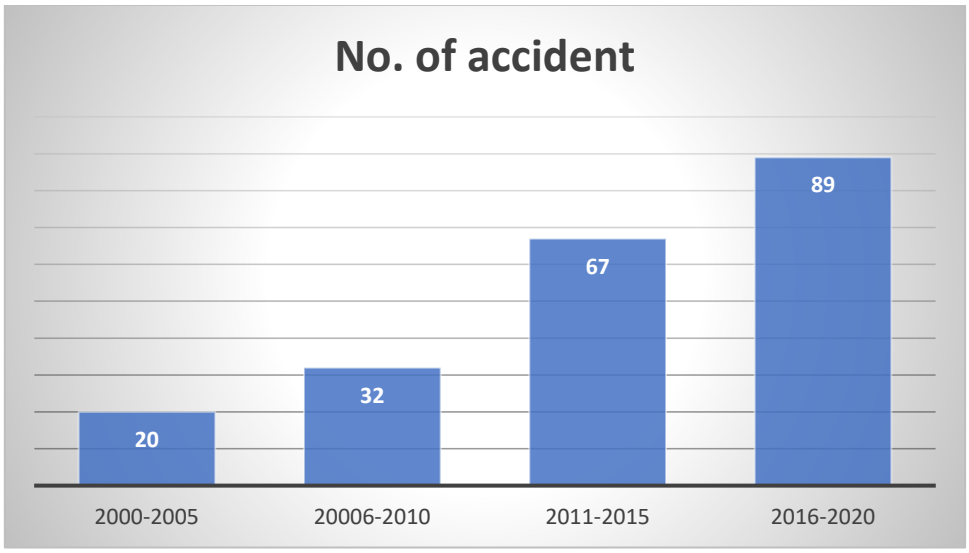
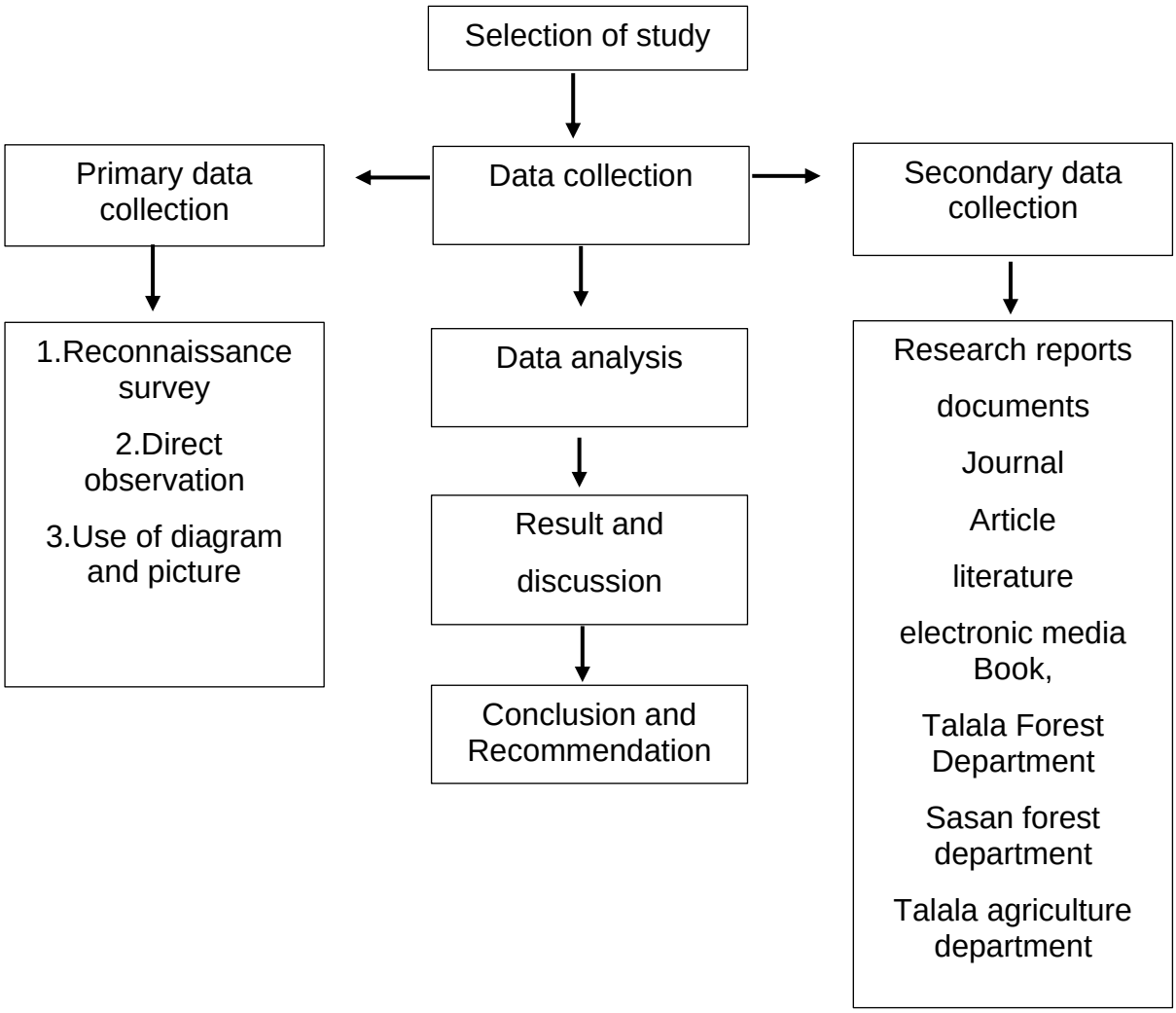


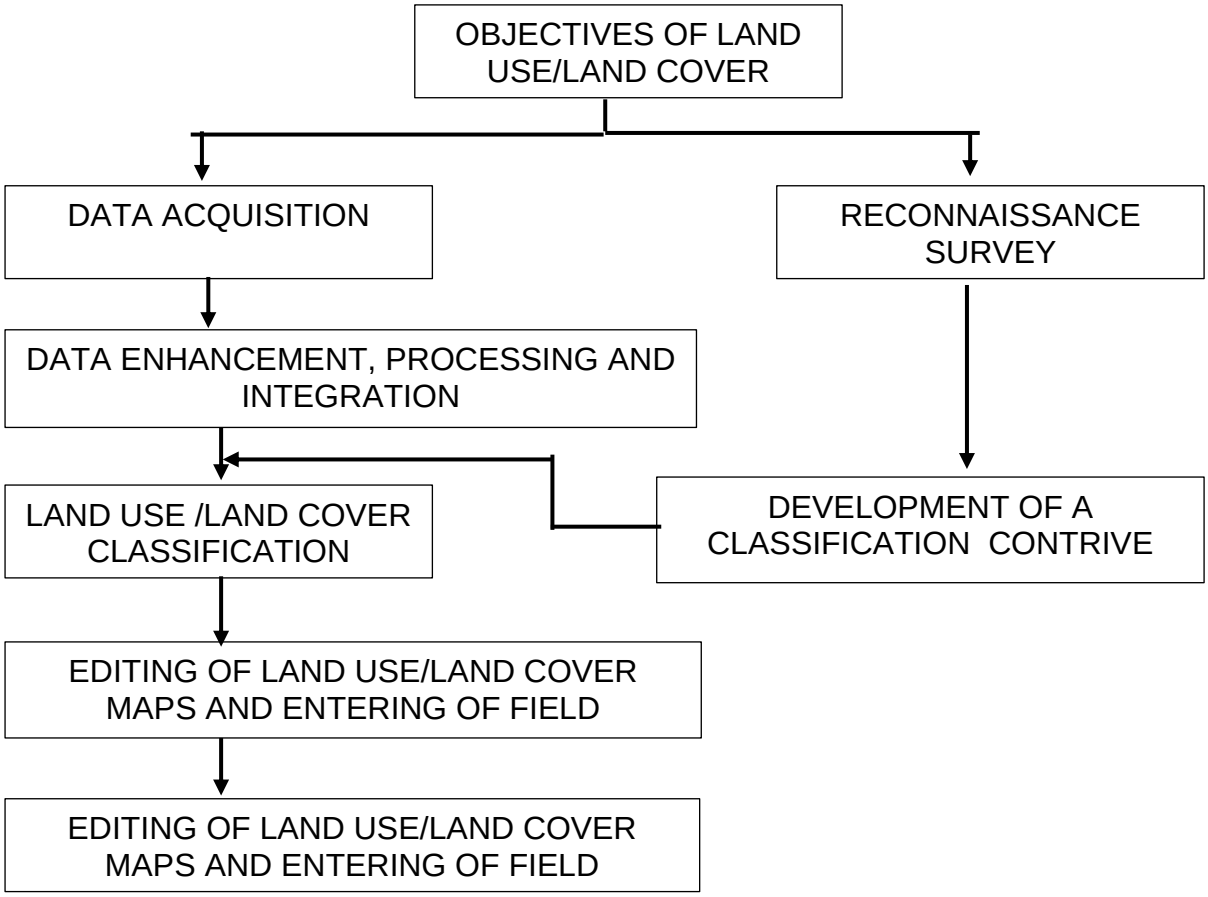
Table 5 No. of acciden

3.3 Methodology



In this study, Landsat image of Gir National Park along with Buffer zone study area was collected from USGS Earth Explorer (earthexplorer.usgs.gov). Based on the objectives of study, four types of features relevant to animals' habitats had identified: presence of water, land cover, vegetation types and Space .The classifications for land cover and vegetation type had set up from a sample survey in the field. The land cover was typically divided into waterbody ,settlement, agriculture lands, forest land.

The identified features had digitized into the GIS software ArcGIS 10.2, thus transformed into GIS layers easier to analyze. Simple Procedure of land use/land cover map with conflict distribution as follows


OBJECTIVES OF LAND USE/LAND COVER
DATA ACQUISITION
RECONNAISSANCE SURVEY
DATA ENHANCEMENT, PROCESSING AND INTEGRATION
LAND USE /LAND COVER CLASSIFICATION
DEVELOPMENT OF A CLASSIFICATION CONTRIVE
EDITING OF LAND USE/LAND COVER MAPS AND ENTERING OF FIELD
EDITING OF LAND USE/LAND COVER MAPS AND ENTERING OF FIELD

Chapter 4: Results & Discussion

4.1 Land use & Landcover

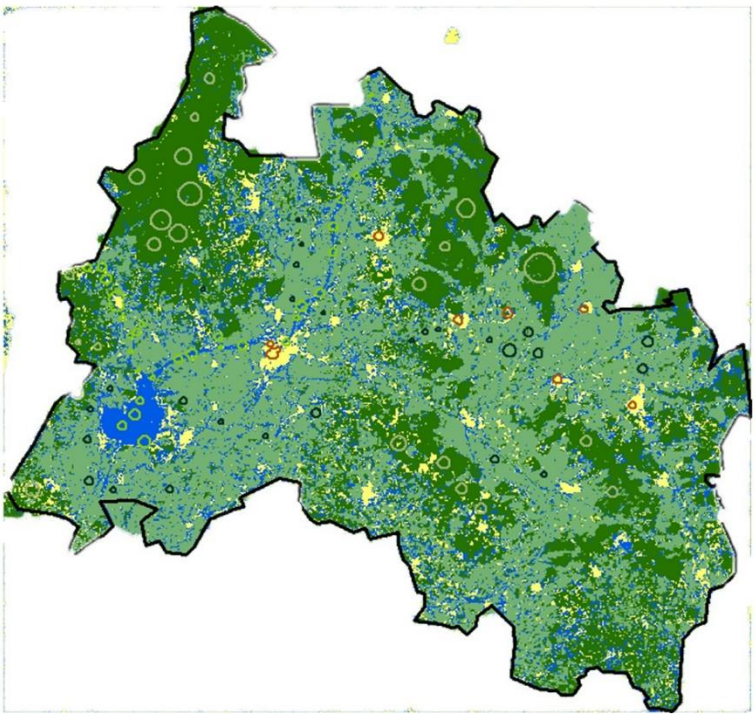


Table 6 LULC Map 2001

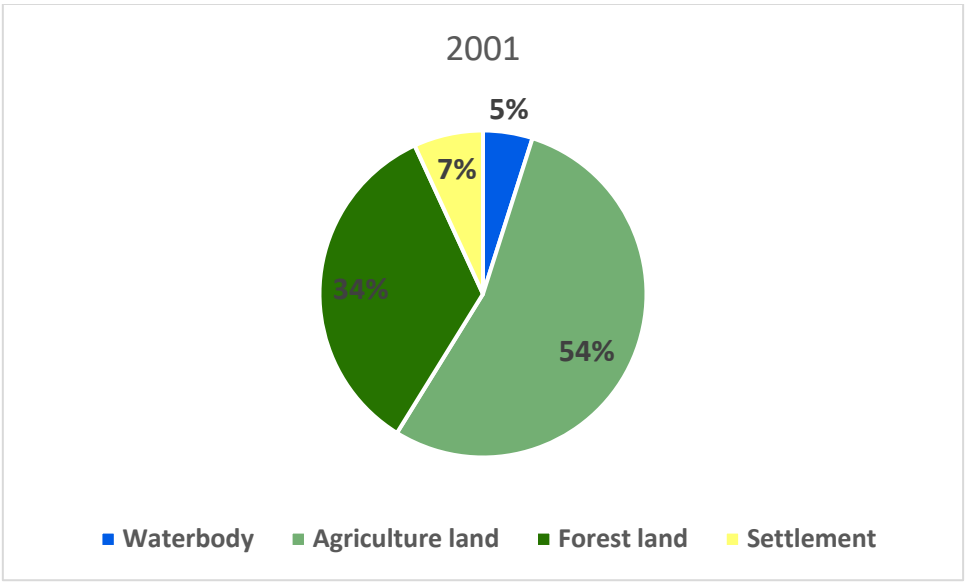


Table 7 Pia Chart 2001

In this LULC Map of year 2001 we can see that agriculture land are more compare to the forest land after the changing pattern of crops the forest area(tree area) are increased which we can see in the LULC map of year 2021.

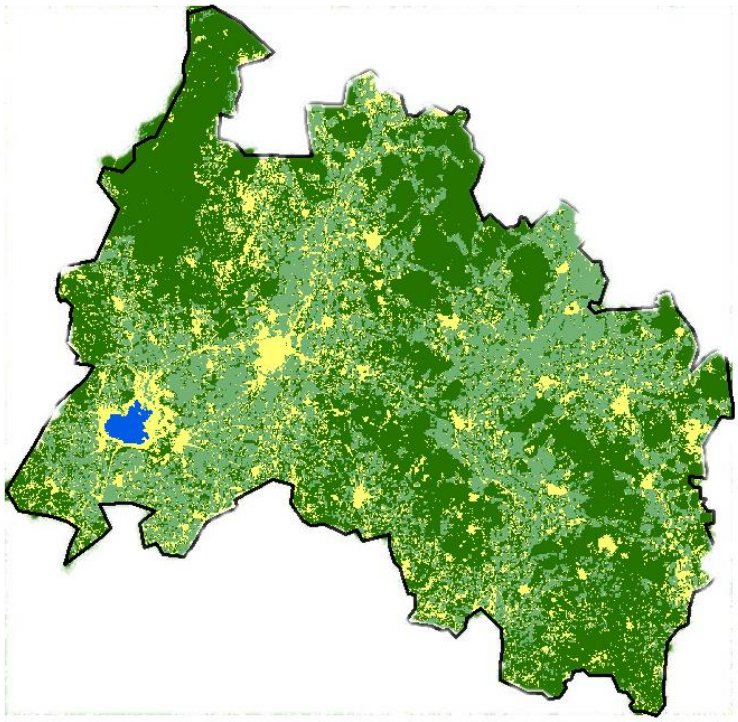


Table 8 LULC MAP 2021

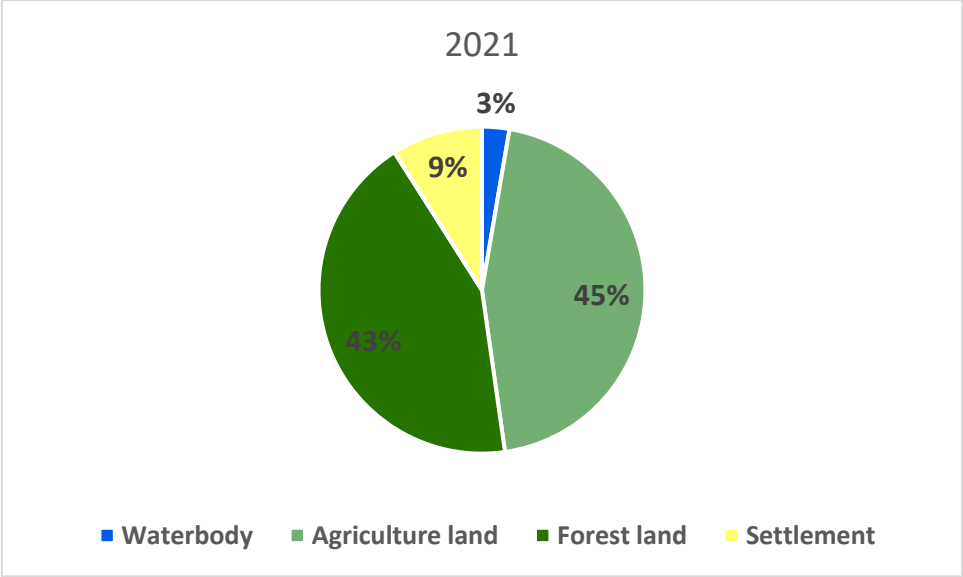


Table 9 Pia chart 2021

In the year of 2021 compare to 2001 the water body area are also decreased. And by the local public the forest agriculture buffer zone are occupied by the farmers. So that the human wildlife conflict is increased in this area.

Based on land use/land cover map Talala, above Habitat suitability class of Wild deer and conflict distribution cartography map following reason concluded why Human-Wild deer Conflict occurred :

1. Land use/land cover Map denotes that because of limitations of water resources in area, natural habitat in that area is not in good condition whereas around the buffer zone ,the area consists of little more water and marsh land resulting to transformation of wild deer nearer to human society.
2. Wild deer prefer moist area with sufficient water resource so they are more concentrate towards water body area & agriculture land.
3. In summer season there is high chance of fire occurrence in forest leading to lack of food for wild animal, these conditions compels the wild boars to prefer their suitable food and water resources from cropland area where farmer make their cropland green almost every month of the year. From above reasons and causes we expect the conflicts to be greater in this area at those times.

4.2 Development of Different corridors

within the State of Gujarat, India.

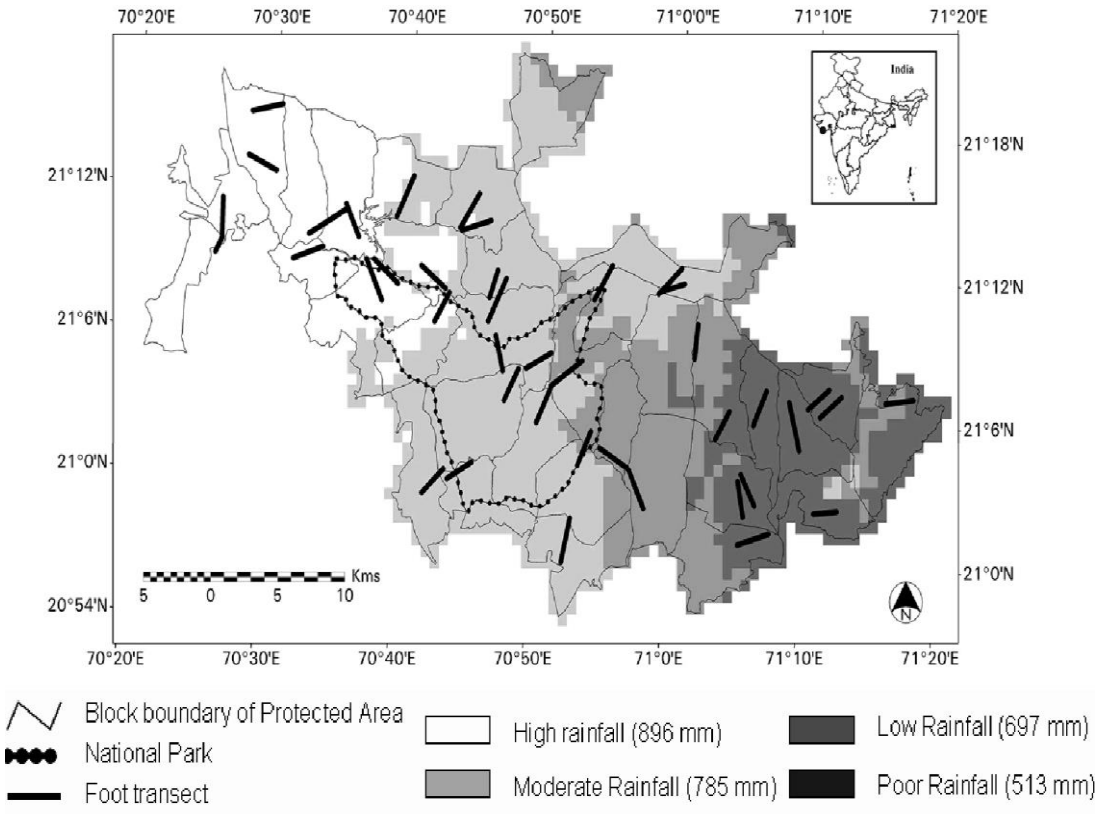


Table 10 Animal Corridors of gir PA area

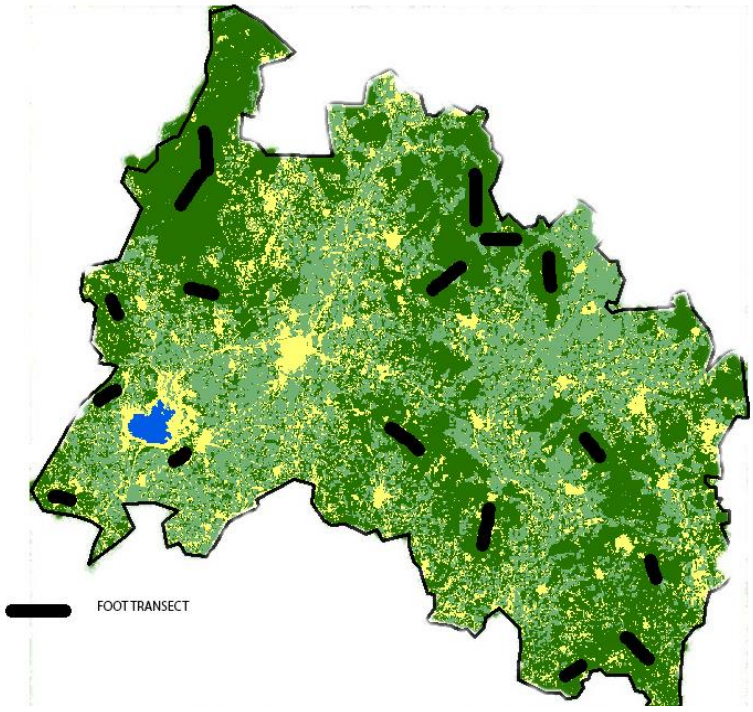
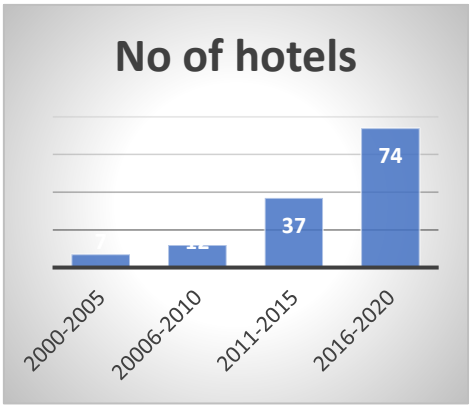


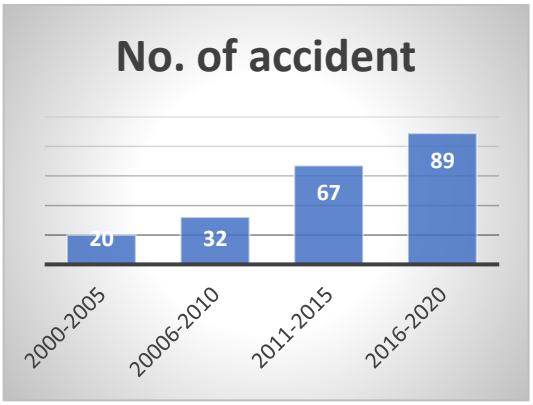
Table 11 Animal Corridors of Talala area

I prepared the map that shows the corridors of wildlife movement. In last 20 years, there is a large change in waterbody So, In the summer season all wild animals changed their corridors to find food and water and they comes to agricultural lands In this map, All corridors of wildlife are near to agricultural lands

The herbivores animals like deer, Nilgay are regularly comes to agricultural fields for finding out the food and after knowing their movements all carnivores animals like leopard, lion etc. also follow their routes and that creates their conflict and also because of presence of farmers in agricultural fields, human wildlife conflict also happens. If We'll provide their basic needs with good vegetation cover, shelter and water facility then conflicts can be reduced.

4.3 Impacts of Human wildlife conflicts





From these graphs we can see that from the last two decades the numbers of tourists are increasing day by day so that tourism sector grows vary speedy so that the numbers of hotels are also increased. In the last two decades the no of accident of human wild life conflicts are also increased at different places. There is need to define policy which underlines the tourism activity on sustainable basis without implicating much pressure on the natural resources.

Chapter 5: Conclusion & Recommendation

Wildlife in developing countries causes considerable impacts on crops and livestock's production. The transformation of forests and other ecosystems into agricultural fields by human beings are some of the major contributors for human wildlife conflicts.

Crop-raiding by wild animals is one of the major causes for the conflict. Crop-raiding undermines food security and tolerance of wildlife within neighboring human communities. Human wildlife conflict has negative impacts on wildlife conservation in the natural habitats and poses the greatest challenges to the persistence and survival of wildlife.

The area of cultivation of sugarcane should be reduced and crops have better visibility should be encouraged. This will prevent hiding place for leopards and reduce the human animal conflict. Crops like medicinal plants that have better market value should be encouraged around the areas close to the sanctuary.

Plantations along the corridors identified should be undertaken to improve the green cover and provide movement for the wild animals. This will prevent them from straying into the agricultural fields.

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