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**The Sustainable Harvest of Wildlife in India: A
Comparative Analysis**

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CERTIFICATE

This is to certify that the dissertation titled '**The Sustainable Harvest of Wildlife in India: A Comparative Analysis**', submitted by Mr. Mrinal Kuttappa (LLM/973/2021) in partial fulfilment of the requirements of the LL.M. degree for the academic year 2021-22 at the National Law School of India University, Bengaluru, is bona fide research work carried out by him under my guidance and supervision.

I further certify that this work is fit for submission and evaluation.

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DECLARATION

I declare that this dissertation titled '**The Sustainable Harvest of Wildlife in India: A Comparative Analysis**', submitted to the National Law School of India University, Bengaluru is an original and bona fide research work carried out by me, Mrinal Kuttappa(LLM/973/2021), under the guidance of my supervisor. In case contributions of others are involved, every effort has been made to give them due credit through citations and reference to the literature. The information contained in this work is true to the best of my knowledge.

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Abstract

In the early 1970s, the **Wildlife Protection Act, 1972** was passed, which imposed a blanket ban on all killing of animals. Considering our severely diminished wildlife populations at that time, this was the undoubtedly best way to move forward. As a result of this, several species have been brought back from the brink of extinction. Several species that were not threatened at that time now have much greater populations.

We are now faced with a new problem: wildlife which is proliferating but running out of natural habitat to exist in. This brings them into conflict with agrarian landowners. Under the current legislative framework, wildlife authorities can allow landowners to hunt and kill non-threatened species which invade their property, but the bodies of these animals must be handed over to the Government for disposal. This is a waste of resources and deprives these individuals of a perfectly good source of nutrition, something which is invaluable, especially in the poverty-stricken regions of rural India.

Over the course of my dissertation, I aim to mount a comparative analysis of other nations that have incorporated sustainable hunting as a means of conservation, and then assess its applicability in the Indian context. It is my opinion that while our current conservation framework is robust, there is still room for improvement, especially when it comes to questions of utility and alleviating man-animal conflict. Incorporating the sustainable harvest of wild game into our conservation framework will serve multiple purposes:

- It gives rural landowners access to a clean, healthy source of protein
- Incentivizes them to adopt legitimate means of control rather than resorting to illegal means such as snares, poison etc.
- Keeps overpopulation of wildlife in check
- Regulation of the process will make it easier to monitor and control illegal trade in wildlife products

Each of these aspects will be analysed in detail to answer the question of whether India should incorporate sustainable harvest into its wildlife conservation framework.

Keywords: wildlife conservation, landowners, sustainable harvest, man-animal conflict, nutrition, hunting, utility

LIST OF ABBREVIATIONS

- 1. ADMADE:** Administrative Design for Game Management Programme
- 2. CAMPFIRE:** Communal Areas Management Programme for Indigenous Resources
- 3. CITES:** Convention on International Trade in Endangered Species
- 4. GDP:** Gross Domestic Product
- 5. HWC:** Human-wildlife Conflict
- 6. INR:** Indian Rupees
- 7. IUCN:** International Union for the Conservation of Nature
- 8. NGO:** Non-Governmental Organizations
- 9. SWA:** State Wildlife Agencies
- 10. TWPF:** Tanzania Wildlife Protection Fund
- 11. USAID:** United States Agency for International Development
- 12. USD:** United States Dollars
- 13. WCRF:** Wildlife Conservation Revolving Fund
- 14. WMA:** Wildlife Monitoring Authority
- 15. WMU:** Wildlife Monitoring Unit
- 16. WWF:** World Wildlife Fund

LIST OF STATUTES

- 1. THE CONSTITUTION OF INDIA, 1949**
- 2. THE INDIAN PENAL CODE, 1860**
- 3. THE PREVENTION OF CRUELTY TO ANIMALS ACT, 1960**
- 4. THE WILDLIFE PROTECTION ACT, 1972**
- 5. THE PERFORMING ANIMALS' RULES, 1973**

CHAPTER I

1.1 Introduction

In 1972, the Central Government under the leadership of the then Prime Minister Indira Gandhi passed the Wildlife Protection Act. It had come to light that rampant habitat destruction and the uncontrolled exploitation of wild resources had led to an alarming crash in the populations of several wildlife species. Special emphasis was given to our national animal, the Bengal tiger (*Panthera tigris tigris*). At the start of the 20th century, the conservationist E.P. Gee estimated there were around 40,000 tigers in the country. Shortly after the Wildlife Protection Act was passed, Project Tiger was launched in 1973 to ensure the prolonged survival of this charismatic species. By this point, the population had plummeted to less than 2,000 throughout the entire sub-continent. This means that there was an estimated 95% decrease in the population in just 70 years!

In such a grim situation, it was decided that the best course of action would be the total ban on the hunting of all species of wildlife. It was with this intention that the Wildlife Protection Act was passed. In the nearly 50 years since then, several species of wildlife have made remarkable comebacks. Our tiger population in 2019 was around 2,967 and growing.¹ This is nearly double what it was in 2006, when a nationwide census found only 1,411 tigers throughout the country. The reason for mentioning the tiger specifically is because of how recognizable it is as our national animal. Lesser-known species were also subject to severe exploitation, but for the most part, no studies were made to estimate their populations.

However, habitat loss continues to be one of the leading threats to wildlife. An ever-increasing human population coupled with limited landmass is a recipe for disaster, and it is the denizens of our wilderness that must pay the price. Wild animals have increasingly come into conflict with man in agricultural areas. Species such as elephants, nilgai and wild boar cause incalculable damage to agricultural property. As forest cover is removed to make way for agricultural and industrial development, these species find themselves with nowhere to go but human habitat. It is ironic that the fact our wildlife protection regime is working effectively has turned out to be double edged sword, as these very animals that are being protected under the law find themselves without natural habitats to make their homes.

¹ [NTCA Tiger Status Report 2018](#)

Under Colonial rule, the forest department oversaw the issue of permits allowing the hunting of individuals of a species. The cost of these permits was determined based on how valuable a ‘trophy’ of that species would be. However, no importance was given to the sustainable use of an animal’s resources, it primarily revolved around the aesthetic value of a ‘trophy’. Big game hunting was a famous pastime of society’s elite. Grand hunts were organised for the benefit of visiting dignitaries from Britain and other countries. It was a matter of prestige to be able to bag as many tigers, leopards, or rhinos as possible. These animals were left to rot after their skin and/or head was removed, a terrible waste of a beautiful creature’s life. There are records of several Indian rulers, who, over the course of their reign, killed *hundreds* of tigers, in addition to countless other species. This is testament to the sheer magnitude of wildlife our country possessed in those days.

The department did their best to ensure that poaching (hunting without permits) was controlled. Fines were levied, weapons seized, and even jail time was awarded to those convicted of poaching. However, the laws made by our imperial overlords were seldom equitable, and most of those convicted of poaching were those who had turned to the jungle to feed their families, stricken by the throes of poverty.

On attaining Independence in 1947, the landscape gradually changed. As a newly formed country, the wilderness and wildlife protection took a back seat. There were more pressing concerns to be attended to, such as the development and industrialisation of our newly birthed nation and the upliftment of its populace.

This paved the way for unscrupulous individuals to exploit our forests, which were, by and large, left without any significant protection. Whereas earlier hunting had been a largely unobtrusive affair, the development of road networks coupled with access to improved technology allowed one to shoot and kill an animal a great distance away from inside the comfort of his own vehicle, aided by powerful spotlights, telescopic sights, and high-powered ammunition. The animal was essentially left with no chance of winning the encounter. This process began to occur on an alarming scale, cause wildlife populations to plummet. In addition to this, forests began to be converted into agricultural lands resulting in the destruction of many wild species. Such was the situation necessitating the passage of the Wildlife Protection Act.

In 2022, we are faced with a different landscape. Wildlife protection measures have been largely successful and the populations of nearly all species have been growing. However,

man-animal conflict has also been increasing, largely due to the destruction of natural habitat along with the corresponding growth of the human population. As we struggle to make more space for ourselves, we push out the animals who are their original residents. In such a situation, it becomes imperative for us to have a proper legislative framework to allow for the management of the situation.

Over the course of this dissertation, the research shall examine the viability of establishing a system where agrarian landowners may be allowed to hunt **non-threatened** species when such species become a nuisance to their agricultural properties. Permission to hunt these animals would be issued based on a license system, subject to the condition that one would only be allotted a permit if he/she would *harvest all consumable meat* from the hunted specimen. This would ensure that the animal would not go to waste, but instead serve as nutrition far healthier than store bought meat. The money earned from the sale of these permits would be exclusively sanctioned for use in wildlife conservation and habitat protection. The money paid to harvest protein from a wild animal would thereby serve to provide protection to other members of not only its, but also other species. This would also allow individuals to understand the value of protecting our wildlife, as it will bring about the two-fold realization that:

- (i) if there are more forests, there would be less wildlife and consequently less damage in their agricultural properties,
- (ii) there is an alternative source of protein, free from hormones and more nutritious than human reared livestock

With an intention to establish these points more definitively, I intend to undertake a comparative analysis of our country's policy against those which have already found success following hunting-conservation models akin to what is mentioned above.

1.2 Statement of Problem:

With our population growing with every passing minute, the burden we are imposing on the planet's natural resources is greater than ever. In India, we lack an efficient framework for the sustainable harvest of wildlife. This dissertation aims to establish whether it is possible for our country to adopt a scheme which allows for the selective hunting and harvest of non-endangered wild animals, especially those which pose threats to agricultural activity.

1.3 Research Questions:

1. Is sustainable hunting an effective means of wildlife management?
2. Can a sustainable hunting-conservation model of wildlife management be implemented successfully in India?
3. Have other countries effectively implemented such conservation models?

1.4 Research Methodology:

The study will be conducted predominantly by doctrinal research using a combination of qualitative and quantitative approaches along with primary and secondary sources.

1.5 Objectives of the Study:

- Propose a framework for the legal harvest of certain species of wildlife
- Look into whether such a framework would be viable, taking into consideration India's diverse populace and unique socio-political scenario
- Establish whether certain species of wildlife can be subject to such control mechanisms without compromising their long-term survival

1.6 Significance of Study:

As our population grows, it is essential for us to have in place a framework that ensures long term survival of both our wildlife and the ecosystems within which they exist. Despite complete protection being awarded to almost all animals under law, it has become increasingly common to hear of individuals laying traps at the borders of their properties to dissuade marauding wildlife from destroying their crops. These traps are often crudely made and can also kill species that were not their intended targets. Animals that are merely passing by can fall victim to such devices and be left to die a slow and painful death. Hunting the problem species selectively seems to be a much more effective way of guaranteeing that the marauders are eliminated, while also ensuring that no other species are harmed. This

dissertation shall assess the possibility of how this could be implemented taking into consideration the unique socio-cultural and geographic conditions of India.

1.7 Literature Review

1. William L. Robinson, The Case for Hunting, The Humane Society Institute for Science and Policy Animal Studies Repository, 1986

In this essay, the author attempts to make a case to justify the act of hunting. It has formed an intrinsic part of our culture from the time of the earliest modern humans. He lists out the various aspects involved in hunting-the attitude of the hunter towards his prey, his attitude towards wildlife, the value of the animals harvested from hunting, and the significance of the act as a sacred ceremony to some indigenous peoples. For instance, the Masai tribe of Africa has a coming-of-age ritual where a young boy is expected to spear a lion before he becomes a man. Several similar traditions exist among different races of indigenous people worldwide.

He speaks of how hunting was regarded as a perfectly normal part of human culture but has gradually been subject to increasing criticism. The author is a wildlife ecologist by profession, but also a hunter. It is quite telling when a person whose very job involves the study of wildlife chooses to participate in the activity. This is nearly indisputable proof that, when done right, hunting does nothing to negatively impact wildlife, but can help foster the overall population's health.

This provides much needed justification for the premise of my dissertation, which is especially important when dealing with a sensitive issue like this.

2. Irena Knezevic, Hunting and Environmentalism: Conflict or Misconceptions, Human Dimensions of Wildlife, 14:1, 2009

This article examines some issues that form the bone of contention between hunters and the anti-hunting movement. The 'moral' arguments against hunting are compared against the anti-hunting movement's reliance on consumer culture, managed environmental protection, and industrialised food production. It also examines the argument of whether all environmentalists are against hunting. As both environmentalists and hunters want the same goal of land preservation, Knezevic

theorizes whether joint conservation efforts are the answer to combat the rapid rates of habitat change.

This adds valuable insight for my dissertation as it helps lay out the dichotomy between the arguments for hunting and those against it and helps to determine whether some midway point may be reached.

3. Edward B. Arnett & Rob Southwick, Economic and Social Benefits of Hunting in North America, International Journal of Environmental Studies, 72:5, 2005

This paper explores the economic and social dimensions of hunting in North America. It has been found that the hunting community contributes large amounts to conservation efforts throughout the continent. Several hunting organizations such as Ducks Unlimited and the Rocky Mountain Elk Foundation, which were initially established to protect hunter interests, are now at the forefront when it comes to the preservation of wild habitats.

A large proportion of the fees and excise duties paid by hunters for hunting licences, animal tags etc. go directly towards funding the Fish & Game department and other conservation efforts, thereby promoting sustainable wildlife management. In addition, there are indirect effects such as the thousands of jobs created for those engaging in the manufacture of outdoor goods and services. The authors thus find that hunters are invaluable to local communities in terms of the revenue they generate. Due to the completely different wildlife laws in India, no such studies exist for our country. However, North America in general employs a very successful hunting-conservation framework, and this paper shows us that when done right sustainable hunting can be a valuable source of revenue to local economies.

4. Shane P. Mahoney & John J. Jackson III, Enshrining Hunting as a Foundation for Conservation-The North American Model, International Journal for Environmental Studies, 70:3, 2013

The article describes in detail how the North American model of wildlife management became so successful. It lays down the seven principles that allowed for North American wildlife to flourish, colloquially known as the “Seven Sisters for Conservation:

- Maintain wildlife as a public trust resource

- Prohibit deleterious commerce in dead wildlife products
- Allocate wildlife democratically and by law
- Ensure that wildlife use is for legitimate purposes
- Preserve hunting opportunity for all
- Recognize and manage wildlife as an international resource
- Ensure that science is the basis for conservation policy.”²

This article is incredibly significant to the topic, as it provides, in essence, a blueprint for what a successful framework must embody.

5. Irene Ring, Klaus Henle, Reinhard Klenke, Carsten Neßhöver & Tilo Arnhold, What to do when Nature Conservation is Successful and Humans face Competition again?, Journal of International Wildlife Law and Policy, 11:2-3, 2008

This article deals with the study of the gradual return of three species of European wildlife, the otter, cormorant, and the grey seal, to habitats from where they had been extirpated. We must find viable solutions to protect threatened species while also providing a mechanism by which compensation is paid to injured human interests. These costs must be borne not just by the affected sectors (such as fisheries and agriculture), but rather, by society as a whole. “Sometimes small changes to farming methods can prevent serious losses; or comprehensive information and the timely involvement of stakeholders can lead to a consensus between nature conservationists and users of nature. If wildlife conservation is to be successful in the long run, participatory conflict management based on natural and social scientific knowledge is required.” They conclude by stating that there is no magic solution and effective answers can only be made when there is collusion between all involved stakeholders.

² Shane P. Mahoney & John J. Jackson III (2013) Enshrining hunting as a foundation for conservation – the North American Model, International Journal of Environmental Studies

6. Joni E. Baker, Trophy Hunting as a Sustainable Use of Wildlife Resources in Southern and Eastern Africa, Journal of Sustainable Tourism, 5:4, 1997

This article examines the various ways in which allowing for the hunting of certain species of animals has paved the way to fund their conservation and anti-poaching efforts. Some of the benefits of hunting mentioned in the article are:

- Hunters are less demanding than eco-tourists, they require fewer amenities and services. Wildlife habitats are thereby kept more pristine.
- The revenue generated by these trophy hunters is many times more than what regular tourists bring into the economy.
- Prime hunting areas are often located in areas that are geographically inaccessible to tourists or are less likely to produce viable animal sightings. Thus, hunters in these areas provide revenue in regions where others might not be able to.
- Hunters play an important role in checking the overpopulation of certain species, thereby fostering biodiversity. The animals removed from the ecosystem by hunters allow the remaining species to thrive as there is reduced competition for limited resources.
- It is also theorized that the presence of legal hunters in an area serves as a deterrent to poachers.

While trophy hunting is not the focus of my dissertation (nor is it viable in India), this article shed light on the positive impact hunters can have on the ecosystem and local economies. This strengthens the case for the harvest of certain species, especially those that might be overpopulated and consequently have a negative impact on the overall ecosystem.

7. Neelam C. Poudyal, Carlotta Caplenor, Omkar Joshi, Cristina Maldonado, Lisa I. Muller and Chuck Yoest, Characterizing the Economic Value and Impacts of Wild Pig Damage on a Rural Economy, Human Dimensions of Wildlife, 22:6, 2017

This paper is a state-wide survey conducted in the American state of Tennessee about the damage incurred by landowners due to feral hogs, which are an introduced species

in the United States. The researchers find that millions of dollars' worth of damages are incurred annually, and large amounts of money are used to employ preventive measures. The wild boar (*Sus scrofa*) is a species native to India and is very destructive in agricultural landscapes. While the study does not involve India, going through it gives us some idea of the level of financial losses sustained due to their actions. We must also note that wild boar is listed as a species of Least Concern by the IUCN and have spread across six continents. This species is a primary focus of my dissertation, and this study gives us a tangible idea of the losses they cause.

8. Kana Koichi, Alison Cottrell, Kamaljit K. Sangha & Iain J. Gordon, What Determines the Acceptability of Wildlife Control Methods? A Case of Feral Pig Management in the Wet Tropics World Heritage Area, Australia, Human Dimensions of Wildlife, 18:2, 2013

An important factor in determining wildlife management methods is determining public acceptance to the measures. This study investigates what would constitute accepted methods of control when it comes to the management of invasive wild pigs in Australia. As the wild boar is native to India, we must note that indiscriminate measures cannot be employed in their control. The authors find that the acceptance of management measures differ across different sections of society. For instance, they find that landowners (who bear losses due to wild pigs) are more likely to be accepting of more varied measures, whereas tourists tend to find some practices cruel. A similar trend can be observed in India, where rural landowners sometimes resort to devious methods to eliminate problem wildlife, while inhabitants of cities raise cries about animal cruelty.

This article is important to my dissertation as it shows us different attitudes to wildlife control. The best solution, especially in a country as diverse as ours, would be one that considers all these differing attitudes.

9. Vasant K. Saberwal, Conservation as Politics: Wildlife Conservation and Resource Management in India, Journal of International Wildlife Law and Policy, 3:2, 2000

This article deals with the challenges posed to wildlife management in India, critically analysing the existing framework. One of the central issues that hinder conservation efforts is the level of involvement of local communities. Large scale action cannot be

undertaken if the locals have been demonized by the State. Nor will the latter be especially inclined to aid forest officials in the execution of their conservational duties when they have been antagonised.

The author finds that while measures such as the employment of forest guards in parks etc. can serve to deter trespass and other visible crimes, they are ineffective against anonymous transgressions such as the poisoning of killed livestock and setting of forest fires. These actions are undertaken due to villagers' resentment towards the State for failing to consider their interests while drafting policy.

It is thus essential to work in harmony with affected human interests when drafting wildlife management policy. This is the premise of my dissertation, that landowners be allowed to take an active role in the management of wildlife that affect them directly.

10. Krithi K. Karanth and Sahila Kudalkar, History, Location and Species Matter: Human-Wildlife Conflict Mitigation From India, Human Dimensions of Wildlife, 22:4, 2017

The authors undertake a survey of around 5000 households in areas surrounding 11 wildlife reserves in India. They find that various methods are employed to prevent marauding wildlife from damaging crops; the methods deployed depend on the target species, availability of technology and economic viability of those control measures.

They also investigate which species are the main offenders when it comes to crop damage and find that these are the Asian elephant (*Elephas maximus*), wild boar (*Sus scrofa*) and nilgai (*Boselaphus tragocamelus*). The Asian elephant is endangered and as such, would be excluded from the purview of my dissertation. Wild boar and nilgai, however, both have healthy populations and have even been declared as vermin in other States in the past. Over the course of this project, I shall try and establish why and how the latter two species, if hunted by agricultural landowners, can be used for **personal consumption** as a valuable source of nutrition, rather than being burnt or buried by the Forest Department.

CHAPTER II

2.1 Wildlife Conservation in 21st Century India

Over the course of my dissertation, I shall attempt to establish two things: First, whether the sustainable harvest of certain species of wild game can be effectively implemented in a country with a diverse background like India? And second, we shall mount a comparative analysis of other nations who have already adopted the hunting conservation model of wildlife management. The territories that we will investigate are North America and six countries in Africa, namely Tanzania, Zambia, Zimbabwe, Namibia, Botswana, and the Republic of South Africa. All the above-mentioned nations have achieved varying degrees of success by incorporating hunting into their wildlife management framework, and an analysis of the same will shed light on whether such a framework could benefit India.

Despite occupying only 2.4% of the world's landmass, India possesses 8% of all living species on the planet. Among these are several keystone species, upon whose continued existence the health of the entire ecosystem depends. An example of a keystone species are the diminutive fiddler crabs in the Sundarbans delta. By digging up the coastline, these crabs allow the mangroves' pneumatophores access to more oxygen. This allows the area's unique landscape to persist and in turn play host to a wide array of endemic species.

What we must learn from this is that a single species can have far reaching impacts on the overall health of the ecosystem. Therefore, we must ensure that practices administered for the management of one species do not have unforeseen effects on others, as this could have potentially catastrophic implications on the food chain. We can better understand this with an instance from our recent past. In the 1990s, vultures were common around villages throughout the country; they performed an essential service by consuming dead animals before decay and disease set in. Indeed, a flock of vultures could strip a large carcass to bone in mere hours! With advances in veterinary medicine, diclofenac began to be administered to treat inflammation in livestock. It was not known at that time, however, that diclofenac was lethal to raptors. When vultures began to consume carcasses that had previously been treated

with diclofenac, they began dying off in large numbers. The issue was eventually identified, but not before vulture populations throughout the country had taken a serious hit. The use of diclofenac eventually began to be phased out, and vultures began making a comeback. Despite this, almost all vulture species in India are still endangered and continued conservation efforts will have to be made to ensure their prolonged survival.

This tells us that we cannot employ a one-size-fits-all approach and expect to achieve similar levels of success in all scenarios. We can also see how hunting, where a certain species is targeted while others are ignored, can have a beneficial effect in checking wildlife populations without having a detrimental effect on other species in the ecosystem. Such forms of meticulous management are exactly what is needed today, where human beings and various species of wildlife are all competing for the same exceedingly limited land and resources.

2.1.1 The Contemporary Conservation Landscape

Wildlife conservation is carried out in India in much the same way as it was before the passage of the Wildlife Protection Act in 1972. The State preserves animals in national parks and sanctuaries, and these are administered by the Forest Department. It is rather ironic to note that we have drastically altered so much of the Earth's surface that it is only possible to preserve wildlife in isolated patches of wilderness instead of them being given free reign of the land, the way they existed before the advent of human civilization. Problems begin to arise when wild animals stray out of these protected areas. This phenomenon is becoming increasingly common because the increase in population of many species of wildlife is almost never accompanied by an expansion of forest cover. Rather, whatever little forest cover is left is constantly subject to pressures and exploitation to cater to ever-increasing human interests.

Under our current legal framework, the Government allows agriculturists to obtain crop-protection guns without much of the hassle that is to be incurred if one attempts to obtain an ordinary firearms license. The doctrine of self-defence allows us to defend our life, family, and property with lethal force, if necessary. Its scope has been broadened under Sections 11 and 12 of the Wildlife Protection Act, 1972 to allow for problem animals to be killed in case they pose a threat to human life or property. State Governments may also issue notifications

declaring certain species of animal as “vermin”; the protection awarded to those animals under law is then removed and humans may kill them without consequence. However, on killing such an animal, the individual has a duty to inform the Forest Department of the same. The Department then sends someone to investigate the circumstances of the killing and then dispose of the animal’s carcass by burning/burial. It is important to note at this point that wild meat is far more nutritious than its domestic counterpart. Despite this, the Government fails to acknowledge that this meat can be used for personal consumption by the person doing the killing.

A top-down approach which imposes a blanket prohibition on the hunting of all species, particularly wild boar is problematic as it fails to consider the huge impact these animals have on agriculture.³ This was in practice even in colonial times as prohibitions on the killing of pigs were imposed to maintain adequate populations for pig-sticking, a form of hunting pigs with spears on horseback. Studies have found that this led to extensive rule breaking and killing of pigs.⁴ Another paper has detailed that the prohibition of killing pigs by local in the erstwhile Sawar kingdom of Rajputana led to impoverishment and revolts by the locals.⁵

As city dwellers, we can have meat or groceries delivered to our doorsteps in minutes with the aid of mobile applications. We must remember, however, that rural landowners (who suffer the most from human-wildlife conflict), do not have access to these same luxuries. To deprive them of an opportunity of consuming healthy protein is, in my opinion, a tremendous fallacy, and reduces the taking of the animal’s life to little more than a mere act of violence.

2.1.2 Obstacles to Wildlife Conservation

The biggest dangers to wildlife are habitat loss and poaching. As the premise of this dissertation is based on a result of habitat loss i.e., humans and wildlife coming into conflict over the same land, it would be beneficial to discuss poaching to make sense of the bigger picture.

³ Oommen, MA (2021) Beasts in the Garden: Human-Wildlife Coexistence in India's Past and Present. *Front. Conserv. Sci.* 2:703432.

⁴ Hughes, J. (2014). “Environmental status and wild boars in princely India,” *Shifting Ground: People, Animals and Mobility in India's Environmental History*

⁵ Gold, A. G., and Gujar, B. R. (2002). *In the Time of Trees and Sorrows: Nature, Power and Memory in Rajasthan*. Durham, NC: Duke University Press

The main reason that poaching still occurs in some regions of the country with alarming regularity is because the Forest Department is under-resourced and have to make-do with the bare minimum. It is not unusual to find forest guards roaming around with ancient .303 rifles, a calibre which is over 100 years old and has been far surpassed by modern cartridges! Poachers are on average better armed, giving them an advantage in any potential confrontations. Add to this how much these guards get paid, and it is quite clear why they would be hesitant to potentially risk their lives for a mere pittance. On the other hand, the profit margins on trade of wildlife and wildlife goods are huge, so poachers are more inclined to take bigger risks in hopes of bigger rewards.

Another issue plaguing our wildlife are the various homemade traps used by locals to deter or capture wild animals. Some, such as the wire snare are relatively easy to fashion, while others such as explosives require more expertise. The issue with these traps is that they do not have a specific target species, so they can kill/maim any creature unlucky enough to pass through. There are several documented instances of domestic dogs being caught in these snares and either suffocating or losing limbs. These reckless trapping practices are a sure-fire way to irreversibly damage a locality's biodiversity, something which is essential to protect, especially considering today's increasingly fragmented habitats.

Considering the above, it is clear that any conservation strategy adopted by the Government must be a dynamic integration of differing strategies. Merely imposing a restriction on the killing/capture of wild animals and employing unmotivated staff is going to do little to aid wildlife populations in the long run. However, it seems that the State is often motivated more by its own political agendas than scientific know-how.

A perfect example of this is Gir National Park. The Asiatic lion (*Panthera leo persica*) has been protected so successfully there that the number of lions in the park now exceeds its carrying capacity, with the result that there are now many lions living on the park's fringes, in close proximity to human beings. Such a situation is bound to create human-wildlife conflict. However, the state Government of Gujarat refuses to transfer some lions to its neighbour Madhya Pradesh, despite Gujarat having no viable habitat for the extra lions it currently possesses. This kind of small-mindedness does nothing to aid the lion's survival in India and is merely a misguided notion to preserve tourist revenue. Instead of having lions in two

Indian states, we are currently left with all the lions in one state, and no place to keep them. We must also consider the fact that two distinct populations would foster genetic diversity and reduce the risk of an inbreeding depression, which the current Gir population will soon be at risk of.

Lastly, there is the issue of growing religious sentiment. Instead of viewing animals as creatures of flesh and blood (like ourselves), there have been increasing cases of people awarding near-divine status to animals. This is the opposite of the scientific spirit we are *supposed* to have as citizens of one of the world's fastest developing nations. Clouded by their beliefs, many people are unable to realize that we have been using animals since the Agricultural Revolution, and it is precisely that which has allowed us to develop into what we are today. They must broaden their viewpoints and understand that when done right, **sustainable** hunting is a surprisingly effective tool for wildlife conservation. The growing scarcity of natural habitat also means branching out from traditional preservationist concepts on conservation to include alternative approaches such as hunting and culling that are currently prevalent only in certain cultures.⁶

2.2 An Overview of India's Animal Laws

The Constitution was amended in 1976 to introduce Article 51-A(g) under the Directive Principles of State Policy. This makes it the duty of all citizens to protect and improve the natural environment including rivers, forests, and wildlife.

Another DPSP, Article 48A provides that all states shall be empowered to protect the environment and safeguard our nation's forests and wildlife.

Sections 428 and 429 of the Indian Penal Code, 1860 make it a punishable offence to kill or maim and animal.

⁶ Oommen, MA (2021) Beasts in the Garden: Human-Wildlife Coexistence in India's Past and Present. *Front. Conserv. Sci.* 2:703432

The Directive Principles, while admirable in spirit, sadly lack an enforcement mechanism and no punishment is provided for their violation. Similarly, the fines imposed under the IPC for killing or injuring an animal are so small that they serve as no deterrent.

The topic of my dissertation relates to the Wildlife Protection Act, 1972 and this shall be analysed in detail. Before we delve into that, it may be beneficial for us to take a brief look at other legislations pertaining to animal welfare.

1. The Prevention of Cruelty to Animals Act, 1960

- Legislation to criminalize the actions of those found to be abusing animals and subjecting them to necessary cruelty.
- The definition of animal is expansive and includes reptiles, birds, and even fish.
- Directions are provided for the care of a dying animal. Euthanasia is authorized in certain circumstances.
- Private ownership of wild animals is prohibited.
- Under Section 4, an Animal Welfare Board is to be set up with a view to ensuring compliance with the legislation. The Board is to be a corporate entity, with powers to sue and be sued.
- Section 5 provides that the Board shall comprise of experts in their fields, including an Inspector General of Forests, Animal Husbandry Officers from the Central Government, members of the Indian Board of Wildlife, representatives from the Central Home Ministry, appointed Members of Parliament and eminent veterinarians, humanitarians, and conservationists. Local legislators are included when drafting policy in those constituencies.
- Section 8 lays down that the Board shall be funded by periodic Government grants and donations from local authorities/private individuals.
- Section 9 provides the functions of the Board- Supervision of laws relating to animal cruelty, formulating guidelines to prevent animals from suffering unnecessary hardship during transportation and before slaughter and reduction of burden on draught animals.

- Section 11 defines ‘cruelty’, which has been giving a very expansive definition and almost any mistreatment of an animal maybe viewed as cruelty under the ambit of the Act. Exceptions to this include the de-horning, branding, nose-roping, and castration of cattle, and the destruction of stray dogs when done with minimal stress. Anything done with the purpose of consuming the meat from an animal is excluded from this Section unless it was done with the express purpose of causing suffering to it.
- Section 13 provides that a Court or Magistrate may pass orders for the euthanasia of an animal in case of needless suffering. This is to be done following examination of the animal by a policeman in consultation with a veterinarian.
- Section 14 provides that experimentation on animals maybe conducted to advance knowledge regarding new physical discoveries, alleviation of stress, combating disease and reducing mortality rates, so long as they do not subject the animal to unnecessary cruelty. Section 15 provides for a Board to monitor animal experimentation, the Chairman of which is appointed by the Central Government.
- Section 22 prohibits the training of certain species such as lions, tigers, and bears for exhibition. Other species cannot be exhibited without a license.
- Section 27 provides that nothing is an offence which is done in the *bona fide* training of animals for police or military purposes.
- Section 28 provides that religious slaughter falls outside the scope of this Act. This is quite interesting as the process of ritual killings are often cruel, and this exemption, in effect, condones a large amount of cruelty.
- Section 35 casts a duty on the State Government to provide treatment and care to animals affected by offences under this Act.
- Section 36 lays down a limitation period of three months from the date of commission of an offence.

2. The Performing Animals Rules, 1973

- Animals cannot be used in performances unless their owners are properly registered under these Rules.
- Unregistered animals, or those subject to cruelty may be seized if found. The authorities can then take a call on whether to rehabilitate or euthanise the animal depending on the degree of its injuries and suffering.
- A comprehensive list of offences against performing animals is provided under Section 26 of the Prevention of Cruelty to Animals Act, 1960.

2.2.1 The Wildlife Protection Act, 1972

When this Act was passed under Indira Gandhi's regime in 1972, wildlife populations were at an all-time low. There were only five National Parks, and most of our nation's wildlife was concentrated in the hunting preserves and forest of former Princely states. In the wake of the confusion of federalisation following Independence, many of these forests had been subject to intense exploitation. The WLPA 1972 may be viewed as the primary legislation for wildlife conservation in India. Project Tiger was also launched on the heels of this Act in an attempt to save the Indian tiger from extinction.

The Act introduced several regulations to safeguard wildlife populations and allow them to recover to their former numbers. It also began the acquisition of suitable landscapes to turn into National Parks, to better safeguard their inhabitants. It also banned hunting in almost all circumstances, which effectively terminated the hunting industry. This meant that the thousands of people engaged in it were left without a source of income. Many of these people were from the economically backward sections, for whom the chance to guide or assist in a hunting safari represented the opportunity to earn additional income to supplement what they made from small-scale agriculture. As a result, these people were forced to resort to poaching in the very forests where they had once guided clients on safari. Their expansive knowledge of the surrounding areas and their inhabitants allowed them to poach wildlife easily. It is quite ironic that the very legislation enacted to protect wildlife inadvertently led to an increase in human-wildlife conflict.

The Act divides species into Six Schedules based on which they are provided with differing degrees of protection. The most endangered species are placed under Schedules I and II. Endangered and charismatic fauna such as the tiger and elephant are placed under Schedule I.

Schedule V lists which animals are considered 'vermin', animals on this list are the only one which can be hunted under the current framework. The only animals mentioned under this Schedule are rats, crows, and fruit bats. Today, there are several other non-threatened species of animals that cause significant damage to human property, yet none of them have been added to the Schedule by way of amendments. Schedule VI deals with protected species of plants.

Different categories of protected areas have also been established under the Act. These are:

- National Parks- Clearly defined areas selected by the Government to conserve wildlife. Their goal is to ensure the natural propagation of wildlife, free from human interruption. As a result, humans are not allowed to alter the landscape or remove the resources from within the boundaries of a National Park. Examples are the Corbett National Park in Uttarakhand (which was India's first) and the Rajiv Gandhi (Nagarahole) National Park here in Karnataka. These places offer tourists the best chance to view wildlife in their natural surroundings.
- Sanctuaries- These are naturally occurring areas where threatened species are protected. Their boundaries are not specifically determined by the state Government and maybe changed over time. Limited human activity (such as honey gathering) is allowed so long as it does not disrupt wildlife activity. The regulatory authority is the Chief Wildlife Warden, who determines who maybe allowed to enter and what activity can take place within it. An example close to home is the Ranganathittu Bird Sanctuary in Srirangapatna.
- Tiger Reserves- These are national parks or sanctuaries that have been tasked with prioritising tiger conservation. These areas are determined by the National Board for Wildlife in consultation with the National Tiger Conservation Authority.
- Conservation Reserves- Located adjacent to national parks and sanctuaries, these areas are established based on the recommendations and aid of local communities.
- Community Reserves- Any community land maybe declared a reserve if the local community has expressed an interest in protecting the wildlife in that area.

We may now look at certain important Sections under the Act:

- Under S.5A, the Act mandates that a National Board for Wildlife is to be set up under the chairmanship of the Prime Minister. It comprises of several other members including the Union Minister from the Ministry of Environment and Forests, members of Parliament, Secretaries to the various Union Departments, the Chief Conservator of Forests, and Directors of the various Natural-Geographic institutions. The Board is to function as the premier statutory authority for wildlife conservation under the Act. They advise the central Government on matters relating to wildlife conservation and other aligned issues. The review and approve of and all matter relating to wildlife, including inclusion/exclusion of National Parks and sanctuaries. The Board's chief function is to propagate the conservation of wildlife.
 - Similarly, State Boards are to be constituted for each state and are comprised of equivalent state level officials. They are delegates of the National Boards and carry out their duties in their specific states.
 - Under S.9, hunting has been completely prohibited, but is subject to exceptions under S.11 and S.12.
 - S.11(1) provides that when the Chief Wildlife Warden is satisfied that any animal has become dangerous to human life or standing property (by way of disease or infirmity) and is beyond recovery, and it has been determined that it cannot be safely captured, they can authorize that such animal may be hunted and killed. Reasons for its inability to be capture must be recorded in writing.
- (2) states that killing or wounding an animal in defence of oneself or of any other person cannot be regarded as an offence under this Act.
- (3) mandates that the bodies of animals killed under the Section are the property of the Government.
- S.12 provides that special permits may be granted by the Chief Wildlife Warden for the collection of species for the purpose of education, scientific research, or scientific management. The reason for such grant must be recorded clearly in writing. In case of Schedule I animals, approval also must be granted by the Central Government. In case of other Schedule species, requisite approval must be granted by the State Government.
 - S. 18 empowers State Governments to declare areas as Sanctuaries if they believe them to be adequate ecological significance. These decisions are often taken on the basis of the State

Wildlife Board's recommendations. The boundaries of such sanctuaries must be described as clearly possible.

- Sections 27-33 provide restrictions in place in sanctuaries, and cases when permission needs to be obtained. Prohibited activities include destruction of wild animals or plants within the sanctuary, causing fires, entering with a weapon, and using banned substances such as chemicals.
- S.33A provides that all livestock within 5kms of the borders of the park are to be immunized to reduce the risk of them spreading disease to wild animals.
- S.34 mandates that all persons in possession of a firearm within 10km of the park's boundaries must apply to the Chief Wildlife Warden to be registered for the same. No new licenses will be granted to those residing within 10km of a sanctuary/ national park's borders.
- S.35 empowers the State Government to declare any area, whether within a sanctuary or not, as a National Park, when it believes that there are geographic or natural reasons to believe that it would be of use in the conservation effort.
- S.38 gives powers to the Central Government to declare areas as National Parks, they will be subject to the same conditions as those created by State Governments.
- Chapter V deals with unlawful trade in animals and their parts. S.39 states that all wild animals, and any apparatus used to capture or kill them becomes the property of the Government. Private individuals cannot exercise ownership over wild animals.
- S.40 states that those persons already in possession of animal parts whether they be skins, horns, or other trophies, must make a declaration of the same to the Chief Wildlife Warden or equivalent officer.
- Once such trophies are verified as having been collected before the passage of the WLPA, the officials will examine the item, identify it, record the inventory, and then issue a certificate declaring lawful ownership under S.42. Any future transfer of such items will need the approval of the Chief Wildlife Warden.
- Under S.50, the Forest Department has been empowered with the ability to conduct inspections, search, and seizure in those areas where they believe offences may be committed. They also have powers to arrest those suspected of committing offences and can produce them directly before Magistrates.

- S.51 provides for punishments for contravention of the law, these vary from nominal fines to life imprisonment, depending on the gravity of the offence and the target species.

2.2.2 Strengthening the Existing Framework

From the above, we can see that India does indeed have a sturdy framework for wildlife conservation. There is, of course, room for improvement. One thing our laws fail to consider is that they are inherently anthropocentric, thus condemning wildlife to exist in the isolated pockets we have created for their benefit.

The WLPA does not consider that if conservation efforts are successful, there might be a situation where the habitats we have set aside for them might not be adequate to house all members of the population. Most herbivores are gregarious to a certain degree, so the issue of lack of habitat is not a concern until we reach a point where there is a scarcity of vegetation to feed on. Carnivores, however, are highly territorial. Apex predators such as tigers patrol vast areas of land, and are quite intolerant of rival conspecifics, particularly in the case of males. Conflicts between two conspecifics always have the potential to turn fatal. As a result of this, weaker animals are often pushed to the periphery of national parks, which brings them into conflict with human beings.

Since tigers and most other predators are endangered, they shall be excluded from the purview of my dissertation. There is also the fact that there is no utility one can derive from the killing of these beautiful creatures, as their meat is inedible. It is thus my opinion that when dealing with problematic carnivores, the best approach is to provide monetary compensation for livestock losses and employ precautions such as preventing livestock from straying into park limits. There are compensation mechanisms in place in some regions, but by the time all the red tape is navigated, and the amount received, it is scarcely enough to offset losses. A streamlining of these processes is thus essential.

Herbivores, on the other hand, are more fecund and less territorial than the largely solitary carnivores. They more readily produce offspring and the fact that they live in groups means there is a better chance for the young to survive. As a result of this, almost all species of herbivores have been doing exceptionally well since the passage of the WLPA in 1972. Following population increases and large-scale reduction of natural habitat, species such as

wild boar and macaques (*Macaca* sp.), have readily adapted to the more nutrient rich foods available in human cultivations. As these are social animals, they have the potential to cause tremendous amounts of damage to crops in a single night. This is especially relevant when we consider that most agriculturalists are small-scale landowners, who cannot afford to lose much of their yield. It is the hunting of such species that can be beneficial in the overall management of wildlife.

In the following chapter, we shall look at the frameworks adopted by North America and some African nations to see if we can successfully integrate our system of conservation with the sustainable-hunting model used by them to manage their wildlife.

CHAPTER III

An Analysis of Contemporary Hunting-Conservation Models of Wildlife Management

A successful conservation system is one that is based in science and accounts for the anthropological, geographic, and biological factors that govern the landscape. Over the course of this chapter, we shall look at two continents; North America is extremely developed and among the forefront of the First World nations while Africa is among the worst faring when it comes to several human development and economic indices. Both have incorporated hunting into their conservation frameworks, and we shall now see why and how they respond to their own unique challenges.

3.1 North America

Once Christopher Columbus discovered the Americas in the 15th century, Europeans soon realized the abundance of resources the New World had to offer. Exploratory voyages were followed by merchants trying to get rich off the fur trade. Soon, there were millions of people plundering the continent's natural wealth. The indigenous Native Americans were frequently uncooperative and often hostile to the strange European aliens. The

Europeans thus decided that the natives would have to be wiped out for them to continue their plunder of the continent.

The most memorable example of this is the extermination of the American buffalo (Bison bison). The buffalo, or bison, roamed America's Great Plains in herds numbering millions. The Plains Indians were comprised of several tribes who followed the buffalo herds and depended on them for everything from food to clothes and shelter. The buffalo's dull senses and unwary nature made them easy targets for firearms. While the Native Americans only killed to sustain the needs of their tribe, European hide-hunters began solely killing for profit. The Army also theorized that the destruction of the buffalo would lead to the weakening of the Plains Indians, whom they were in constant conflict with. Thus began the indiscriminate slaughter of these majestic animals. By the end of the 19th century, their population had been reduced from several million to a few thousand. With this devious strategy, the Army was also able to subdue the once feared Plains Indians to a shadow of their former selves. The only cost was the near-total destruction of the continent's largest land animal, an iconic Western species.

Several other large game species such as moose, elk, wolves, cougars, and grizzly bears, once widely distributed throughout the continent were soon reduced to fragmented sub-populations living in remote areas inaccessible to humans. The natural landscape was also permanently altered, whole forests were felled for timber, rivers were dammed, and perennial streams began to dry up because of excessive silt deposits. Academics slowly began to wonder if the pace at which these natural resources were being exploited was sustainable, and this led to the gradual development of the conservation philosophy. The cause of conservation was championed by a growing class of outdoorsman, who advocated the sustainable use and democratic access to wildlife and the wilderness. A similar trend was observed in Canada, with the result that hunters and outdoorsman began to look out for wildlife, at a time when very few other people did.⁷

Another reason why North America is successful in wildlife conservation is the 26th President of the United States, Theodore Roosevelt. Roosevelt was a hunter and held a keen fascination for the outdoors. During his tenure, he spearheaded the creation of the United States Forest Service and established 121 national parks across 31 states, leading

⁷ Shane P. Mahoney & John J. Jackson III (2013) Enshrining hunting as a foundation for conservation – the North American Model, *International Journal of Environmental Studies*

to a total protected area of 230 million acres (930,000 square kilometres)⁸. The fact that much of the American wilderness remains relatively pristine even today maybe attributed in large part to the efforts of Roosevelt, who had the foresight to take action before the landscape became irreversibly damaged.

The seven principles of the North American model, as mentioned in the introduction, are as follows:

- “• Maintain wildlife as a public trust resource
- Prohibit deleterious commerce in dead wildlife products
- Allocate wildlife democratically and by law
- Ensure that wildlife use is for legitimate purposes
- Preserve hunting opportunity for all
- Recognize and manage wildlife as an international resource
- Ensure that science is the basis for conservation policy.”⁹

This model is based on the twin notions of wildlife not being infinite and the sustainable use of natural resources. Over time, these principles were amalgamated by an array of laws, policies, and conventions into what we know today as the North American Model of Wildlife Management. Since its development in the mid-19th century, it has been remarkably effective in safeguarding and fostering wildlife populations while also allowing citizens to make use of these resources for their own benefit. The best indicator of this success is the comeback of the American bison, whose population has grown from the last few thousand to over half a million animals today.

This success has also had the effect of creating its own economy and with it, thousands of employment opportunities., one of which is the emergence of a new field of study relating to the science and management of the outdoors. A large reason for the success of this model is because it employs an incentive-based approach reliant on recreational hunters and fishermen to meet their objectives.¹⁰ A significant portion of the costs borne by outdoorsmen in the

⁸ Douglas Brinkley, *The Wilderness Warrior: Theodore Roosevelt and the Crusade for America*

⁹ Shane P. Mahoney & John J. Jackson III (2013) Enshrining hunting as a foundation for conservation – the North American Model, *International Journal of Environmental Studies*

¹⁰ *Ibid.*

pursuit of game goes directly back to funding conservation efforts through the Fish, Wildlife, and Parks service. The impact such outdoorsmen can have on conservation has been seen by several international organizations, who have begun to incorporate sustainable hunting into their frameworks.¹¹

Allowing citizens to determine what happens to their wildlife is a concept that is at odds with the colonial approach adopted in India and several other developing countries, where the State is the sole owner of wildlife and our only role is as observers. However, the cultural and economic divide between North America and the average African or Asian nation is so stark that it would make little sense to adopt the same approach in those countries. What we can do is use the seven principles as the backbone and then tailor our conservation policies to suit our needs. One thing is clear, sustainable hunting is an effective means of wildlife conservation, especially when the stakeholders know the value of their natural resources.

3.2 Africa

Due to overpopulation, poverty, internal conflicts, and a lack of education, the ecosystems of many developing countries are severely fragmented with the result that most of their wildlife is endangered or extinct. Under these circumstances, protecting a species requires that it be granted suitable economic value (while alive), while also incentivizing sustainable use and empowering local communities as custodians of wildlife.¹²

We must also consider the fact that, due to more pressing socio-economic concerns in these countries, departments in charge of forests and wildlife are placed on a backseat and are consequently “understaffed, underfunded, ill-trained and ill-equipped to conserve habitats and species”.¹³ A solution that meets both these concerns is sport hunting. While

¹¹ Ibid.

¹² Butler, V. (1995) Is this the way to save Africa's wildlife? *International Wildlife*, 38–43.

Cohn, R. (1994) The people's war on poaching. *Audubon*, 70–84.

Kelso, B.J. (1993) Hunting for conservation. *Africa Report*, 68–71.

Rihoy, E. (ed.) (1995) *The Commons Without the Tragedy: Strategies for Community Based Natural Resources Management in Southern Africa*. Lilongwe, Malawi: SADC Wildlife Technical Coordination Unit.

¹³ Kothari, A., Anuradha, R.V. and Pathak, N. (1997) Community-based conservation: Issues and prospects. Paper presented at the Regional Workshop on Community-based Conservation: Policy and Practice, New Delhi, India, Indian Institute of Public Administration.

the focus of this dissertation is not sport hunting, looking into the dynamics of this model can give us some idea of the benefits to be gained by the participation of local communities in wildlife management.

Sport hunters spend large amounts of money to be able to hunt African big game species. While the hunter gets to keep the skin, horns and other trophies from the slain animal, the meat is used to feed nearby villages. Expenses borne by the hunter over the course of their stay also directly enriches the local economy. In an area where malnutrition and even starvation are real concerns, this gives the people access to a rich source of protein, something essential to their health and well-being. Long-term conservation in these regions can thus only be successful by ensuring community participation, and when these communities can derive some economic and nutritional utility from the sustainable use of their wildlife resources.¹⁴

For such a model to be successful, however, biological, and ecological considerations are essential. Laws generally prohibit the killing of female and immature animals, as these can have a greater detrimental impact on the population's growth. The animals most often targeted by sport hunters must therefore be older males, which contribute very little to breeding populations. Since hunting quotas are a mere fraction of the total population, the harvest of these animals can actually serve to bolster populations, by reducing competition for the same resources.¹⁵

Another important consideration are problem animals. Although they can provide food for humans, many species of African wild game pose a threat to human lives, livestock, and crops. In such a situation, it is impossible to preserve the life of every animal, as many humans coexist with them at subsistence level and consequently suffer from abject poverty.¹⁶

We shall now look at the frameworks adopted by six African nations:

3.2.1 Tanzania

¹⁴ Baskin, Y. (1994) There's a new wildlife policy in Kenya: Use it or lose it. *Science* 265, 733–4.

¹⁵ Morrill, W.I. (1993) The tourist safari hunter's role in conservation. Paper prepared for Safari Club International, Herndon, VA.

¹⁶ Satchell, M. (1993) Wildlife's last chance. *US News and World Report* 115 (19), 68–76.

In Tanzania, sport hunting is allowed in game preserves, national forests, and game-control areas. In total, they encompass around 180,000 square kilometres and are divided into 150 hunting blocks. The Ministry of Tourism, Natural Resources and Environment is authorized to allocate hunting blocks and species limits based on population surveys conducted by the Serengeti Wildlife Research Institute. Outfitters, who organize these hunting expeditions for sport hunters, collect fees from them and after taking their cuts, remit the amount to the Tanzania Department of Wildlife. This amount is then deposited in the Tanzania Wildlife Protection Fund (TWPF). This fund is used to offset the costs the Government incurs in wildlife management. The per animal fee is divided in the following ratio: 10% to the TWPF, 25% for the Central Treasury, 15% to District Councils to compensate for damage caused by wildlife and the remaining 50% goes to the game reserves. A new plan allows for local communities to form associations to eventually take up management of hunting in their areas.¹⁷

On average, hunting outfitters pay the Government around \$7500 USD per hunting concession (block) per year. Tanzania has been quite successful in using this sport hunting system, as is evidenced by the fact that it is today one of the best places in the world to view African wildlife. A large proportion of the fees paid by hunters goes directly back into the administration of game preserves. The adoption of a similar system in India, but with agrarian landowners replacing sport hunters, has the potential to succeed.

3.2.2 Zambia

Zambia's 33 game management areas have been divided into blocks controlled by Wildlife Monitoring Units (WMUs), which are in turn controlled by Wildlife Monitoring Authorities (WMAs). WMAs are composed of government officials, individuals from the private sector and local community representatives. They are responsible for setting up bag limits, distribution of revenue and its ancillary functions. The Zambian Government established a Wildlife Conservation Revolving Fund (WCRF) in 1983 to redistribute hunting income into wildlife management, conservation, and local community enrichment. This community-based conservation approach was formally adopted in 1988

¹⁷ United Republic of Tanzania (1994) Draft policy for the management of tourist hunting. Dar es Salaam, Tanzania.

with the introduction of the Administrative Design for Game Management Programme (ADMAGE) in 1988, this was made possible with the assistance of the World Wildlife Fund (WWF) and the United States Agency for International Development (USAID) The WMUs and WMAs operate in Zambia under this ADMAGE framework. WMUs are the principal functionaries of wildlife conservation in Zambia, they identify issues and implement those objectives sanctioned by the WMAs.¹⁸

Trophy fees and related costs are invested into the WCRF and is divided in a three-way split: 25% to the National Parks and Wildlife Service, 35% to the local management sub-authorities, and the remaining 40% is used to aide game scouts and field units' conservation efforts in the area where the animal was harvested. The local authorities have the discretion to use these funds for community development initiatives such as healthcare, education, and groundwater extraction.¹⁹

The employment of a community-oriented conservation approach by Zambia has been quite effective in reducing poaching while also bringing in capital for much needed development projects. This highlights the importance of community participation in conservation. India, with its similar landscape of low-income households coupled with high population density, can learn from this.

3.2.3 Zimbabwe

Under the 1975 Parks and Wildlife Act, landowners were granted the authority to make use of wildlife on their land. This legislation was later amended post-Independence (in 1982) to also give this power to rural district councils.²⁰ Currently, trophy hunting is allowed on communal lands, state safari areas, indigenous forest areas and on private land.²¹

¹⁸ Gibson, C.C. and Marks, S.A. (1995) Transforming rural hunters into conservationists: An assessment of community-based wildlife management programs in Africa. *World Development* 23 (6), 941–57.

¹⁹ Murphree, M. (1996, July) The cost/benefit approach to wildlife management and the 'Producer community' in the CAMPFIRE program. CAMPFIRE Association Publication Series 1, 16–18.

²⁰ Ibid.

²¹ Proposal 10.27 (1997) Transfer of the Zimbabwe population of *Loxodonta Africana* from Appendix I to Appendix II, Convention on International Trade in Endangered Species of Fauna and Flora (June) 10th Conference of the Parties, Harare, Zimbabwe.

Management of wildlife rights were formalized under the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) in 1989. The Department of National Parks and Wildlife Management is the central authority which lays down hunting quotas and trophy fees, these local communities are the administrative units. They can sell hunting or photographic safari rights on their properties. As of 1997, 32 of 55 local districts had joined the CAMPFIRE programme, which is backed by several domestic and international donors.²²

District councils collect the hunting fees and can retain 15%. 35% is to be used for wildlife management activities, and the remaining 50% goes back to the local community economies. This percentage is often divided equally among the heads of village households. Other communities use it to finance healthcare, education, and infrastructure. Under the CAMPFIRE programme, the income earned by these local communities has grown exponentially, from a mere \$700,000 USD in 1989 to around \$13 million USD in 1995. This is also much higher than the income earned under CAMPFIRE by non-consumptive wildlife tourism, which generated a mere \$1 million USD in 1995.²³

3.2.4 Botswana

Hunting concessions are awarded via auction, with the rights going to the highest bidder. Such a system ensures effective management as only genuinely interested parties make bids and will have to make significant investments upfront. Management plans must then be submitted for approval by the Government. To ensure equity, hunting licenses are awarded by a draw of lots. Everyone thus has the same odds of winning a license. In contrast to other African models, the cost of these licences is kept low enough for even Botswanan citizens to afford them.

Concession owners are given preference when purchasing licences from individuals who wish to sell them.²⁴ Hunting fees are paid to the Botswana Department of Wildlife, which

Heath, D. and Machena, C. (1997) Sport Hunting in Zimbabwe (brochure). Harare, Zimbabwe: Department of National Parks and Wildlife Management.

²² Butler, V. (1995) Is this the way to save Africa's wildlife? *International Wildlife*, 38–43.

Maveneke, T. (1996) The principle and practice of CAMPFIRE. CAMPFIRE Association Publication Series 1, 7–9.

²³ WWF Programme Office, Harare, Zimbabwe. CAMPFIRE Income and Allocation 1989–1995.

²⁴ Chatwick, K. (1995) Hunting has a vital role to play. *Kalahari Conservation Society Newsletter* 47, 13–14

then distributes them among the various District Councils.²⁵ Local communities can also apply for leases in wildlife management and control areas under the Wildlife Conservation and National Parks Act of 1992. This then allows them to authorize local hunting or the sale of licences to hunting outfitters and tourists.²⁶

3.2.5 Namibia

Hunting concessions in the Caprivi Strip and Bushman land were offered by the award of tenders and public auction by the Government in 1988. Hunting quotas were provided for three-year periods.²⁷ There are also around 208 hunting farms controlled and operated by the Government.²⁸ Private outfitters can set their own rates but are encouraged to adhere to the standards set by the Namibian Professional Hunting Association.

The Government collects revenue via taxes imposed on these outfitters which are then used to fund national parks, conservation, and research efforts. In 1996, a Conservancy Policy was introduced which allowed local communities access and benefits from their natural resource via hunting and other forms of eco-tourism. Hunting quotas proposed by these communities are approved by the Ministry of Environment and Tourism subject to sustainable use guidelines. Under this policy, the fees collected from these areas may be utilized entirely by these local communities.

From the Namibian model, we can see that allowing the economic benefits to return to the areas from where the natural resource was harvested serves as a valuable incentive to entice local communities to engage in its continued protection.

3.2.6 Republic of South Africa

²⁵ White, R. (1995) Licensing of hunting in Botswana. *Kalahari Conservation Society Newsletter*, 15–16.

²⁶ US Agency for International Development (1995) *The natural resources management project, briefing notes.*

Steiner, A. and Rihoy, E. (1995) *The commons without the tragedy?* In E. Rihoy (ed.) *The Commons Without the Tragedy? Strategies for Community Based Natural Resources Management in Southern Africa* (pp. 9–53). Lilongwe, Malawi: SADC Wildlife Technical Coordination Unit.

²⁷ Proposal 10.26 (1997) *An annotated transfer of the Namibian population of the African elephant Loxodonta Africana from Appendix I to Appendix II, Convention on International Trade in Endangered Species of Fauna and Flora (June) 10th Conference of the Parties, Harare, Zimbabwe.*

²⁸ Joni E. Baker (1997) *Trophy Hunting as a Sustainable Use of Wildlife Resources in Southern and Eastern Africa, Journal of Sustainable Tourism*, 5:4, 306-321

In comparison with many other African nations, South Africa fares much better on a wide range of development indices. In recent times, however, it has been subject to scathing criticisms for allowing the practice of high-fence hunting. Here, animals that are raised by humans are released into large, fenced enclosures after which wealthy tourists pay to shoot them. This is grossly contrary to the principles of fair chase, which is what differentiates hunting from the mere killing of an animal. In an enclosed space, the animal has no chance of escape.

Controversial practices aside, South Africa has an abundance of large game species. Hunting is carried out largely on private game preserves and selected areas of some National Parks. Under law, tourist hunters are to be accompanied by professional hunters, who negotiate a fee with the landowners based on the species. Concession fees must also be paid. For rarer species, these prices can be rather exorbitant, which is why many landowners see this as a lucrative opportunity. For instance, the revenue generated from hunting white rhinos amounted to \$2 million USD in 1995.²⁹

The Government authorizes landowners to cull overpopulated species. This is an indicator of the success of the hunting model of wildlife management. Landowners then charge wealthy tourists a premium to hunt these animals. From the above, we can see that although hunting is a largely economic affair in South Africa, their model of conservation has been exceedingly successful in fostering wildlife populations.

3.3 Critiquing the African Model

In order to maximize benefits to conservation and local communities, the trophy hunting system of wildlife management must meet the following criteria:³⁰

- Quotas must be based on scientific estimates: Despite Government estimates of wildlife populations having always been high, the former professional hunter turned conservationist Pat Carr-Hartley notes “The quota is not scientifically

²⁹ Proposal 10.28 (1997) The attachment of conditions to the Appendix II listing of the South African population of the southern white rhinoceros (*Ceratotherium simum simum*), Convention on International Trade in Endangered Species of Fauna and Flora (June) 10th Conference of the Parties, Harare, Zimbabwe.

³⁰ Joni E. Baker (1997) Trophy Hunting as a Sustainable Use of Wildlife Resources in Southern and Eastern Africa, *Journal of Sustainable Tourism*, 5:4, 306-321

produced. The aerial counts are by no means accurate, and the Department of Wildlife and National Parks say they use these counts in tabulating their quotas. The only way to accurately count large herds is to photograph them and then count each individual animal in the picture. The method used now is to count ten animals and guesstimate the number of times this goes into the size of the herd.”³¹ In Zambia, the Government has admitted that it does not engage in census of base quotas as the costs were too prohibitive.³² A technical report of the ADMADE programme in 1993 found that hunting licenses were frequently oversold and not based on scientific estimates.³³ When two new hunting concessions were created in Tanzania’s Mkomazi Game Reserve, the Tanzanian Wildlife Conservation Society estimated that the lion population was inflated by as much as 300%.³⁴

- Quotas are only effective if strictly enforced: Frequent complaints have been raised about the issue of quota-exempt hunting licences to influential persons. Local community head and game scouts have described this in dismay as a form of legalized poaching.³⁵ A report from the Economist in 1990 states that oil barons and sheiks from the Middle East were among the keenest of hunters: “Their parties, armed with automatic rifles and searchlights, travel with up to 40 four-wheel-drive vehicles, towing water trucks, generators and refrigerators for food and carcasses. Several princes and at least one minister have been involved in the mass slaughter of animals. Local preservation laws, barely enforced by underpaid officials, are waived for very senior visitors.”³⁶ As if that were not bad enough, an anonymous Tanzanian outfitter has remarked that these so called “hunters” who shoot anything in sight, including the cubs of lions and cheetahs.³⁷ Such practices are directly in contradiction with the principles of sustainable use and will lead to the destruction of wildlife populations.

³¹ Joni E. Baker (1997) Trophy Hunting as a Sustainable Use of Wildlife Resources in Southern and Eastern Africa, *Journal of Sustainable Tourism*, 5:4, 306-321

³² Lewis, D.M. (1993) *Safari Hunting and Conservation — A Guidebook to Zambia*. Lusaka, Zambia: National Parks and Wildlife Services, Ministry of Tourism, Republic of Zambia.

³³ World Wildlife Fund (1993) Zambia natural resources management project paper supplement: Technical analysis. Unpublished manuscript.

³⁴ The hunting industry in Tanzania (1995) *Miombo* (Newsletter of the Wildlife Conservation Society of Tanzania) 12, 1–2.

³⁵ Cohn, R. (1994) The people’s war on poaching. *Audubon*, 70–84.

³⁶ *Economist* (The) (1990) The Sahara — Desert slaughter. October 27, 317, 45.

³⁷ Bonner, R. (1993) *At the Hand of Man*. New York: Alfred A. Knopf.

- Thorough regulation of the hunting industry: Ethical hunting practices are central to this model of wildlife management, and care must be taken to ensure they are followed. Carr-Hartley held a similar view, stating “transferring of licenses from one area to another and between one person and another; there have been many instances where a license return has not been endorsed after the animal has been shot. Because there is a lack of control, and the licenses are not checked, people can hunt the animal again and again.”³⁸ Another study has found that there is little to no control over hunters. Wounded animals are often not followed up and left to die, while other practices such as shooting from vehicles are rampant and all contribute to over-hunting.³⁹

3.4 Different Landscapes, Different Approaches

A perusal of the above tells us that there is still much that can be done to improve the management system in Africa. One thing is clear, that community-based participation is essential to success, particularly in developing countries. Programmes which provide an economic value to animals and incentivize local communities to protect them are the way forward, but the benefits from such practices must accrue in a way that is transparent and subject to review. Without mechanisms for this in place, it will lead to the same problem of the rewards being reaped by the few in power, while a greater percentage of people are left behind. This will in turn result in them engaging in poaching and other illegal activities, thereby nullifying overall conservation efforts.

North America, on the other hand, is very different from Africa. Their model of wildlife conservation is based on the premise that all citizens are allowed to use and access their natural resources. The average American is far wealthier than the average African, it only follows that they have more resources to employ in the pursuit of recreational (for the most part) hunting. On the contrary, in Africa, where people might depend on wild game as a means of subsistence, the laws are structured in such a way that only the wealthy are able to

³⁸ Carr-Hartley, P. (1995) Depletion of the wildlife in Botswana. Kalahari Conservation Society Newsletter 47, 8–9.

³⁹ White, R. (1995) Licensing of hunting in Botswana. Kalahari Conservation Society Newsletter, 15–16

afford it. The silver lining is that the meat from animals hunted does in fact feed local communities.

CHAPTER IV

Conclusion and Recommendations for India

In this final chapter, we shall discuss the essential features of a sustainable hunting framework and determine what parts of it are suited for adoption in the Indian landscape. Following this, we will examine a study on Indian species responsible for human-wildlife conflict and measures that are employed in its alleviation.

4.1 The Principles of Sustainable Hunting

These principles have been mentioned in the paper ‘Enshrining Hunting as a Foundation for Conservation- The North American Model’, by Shane P. Mahoney and John J. Jackson III. We shall now look at five of the seven principles which are suitable for the Indian landscape.

- **Conservation policy to be science based-** The most important feature of any management system is that it must be grounded in science. In terms of wildlife management, this means the periodic census of animal populations and determination of whether there is suitable habitat for that population to exist in. As we saw in the previous chapter on Africa, ignoring this can have serious consequences on overall wildlife populations. Having a policy grounded in science is also a good defence against baseless religious or political sentiments.
- **Maintaining wildlife as a public resource-** This proposes that the government holds wildlife in trust not for itself, but as a resource belonging to its people. In North

America, this practice stems from a 19th century case, **Martin v Waddell**.⁴⁰ Here, a New Jersey landowner's claim for exclusive access to oysters on certain mudflats of a river were denied. The Court found that while the land was owned by the claimant, the oysters themselves were the property of the State. It would thus be unfair to provide the landowner with exclusive access to the same. Several similar decisions have led to the emergence of the Public Trust Doctrine. This doctrine serves to benefit wildlife as it prevents the privatization of wildlife, wild animals are seen instead as something owned commonly by all of humanity. However, this doctrine is not free from controversy as private landowners have increasingly begun to claim that the wildlife on their land is their exclusive property. In India, wildlife is owned by the State. Allowing landowners to make use of already hunted animals for personal consumption is a much better alternative to merely disposing of their carcasses.

- **Recognition of wildlife as an international resource-** Another argument in support of the Public Trust Doctrine, it proposes that wildlife knows no boundaries, and as such, it must be protected across all territories. This serves to remind policymakers of their trans-boundary responsibilities and motivates them to act on the same. Several wildlife conservation treaties in effect today have large participation largely because of the gradual realization that wildlife is an international resource.
- **Wildlife use to be legitimate-** This seeks to ensure that any harvest of wild animals in justified and will be utilised adequately. There are punishments in place for shooting an animal and leaving it to die without harvesting all its meat. For a long time, animals (especially predators) were killed for no reason and left to rot. This principle allows us to kill only when we can justify the reasons for doing so. It also eliminates the issue of animal wastage by laying down when an animal's life may be taken- for food and fur, self-defence, and property protection.
- **Prohibiting harmful commerce in dead wildlife products-** This is a facet which is already banned in India and must continue to be. Allowing for the commercialization of hunted animals will open a Pandora's box of illegal trade and poaching in a quest for profit. The only way a hunted animal must be used is for personal consumption of its meat by the landowner. The hide and horns maybe kept by the owner, but the trade of all wild animal products must be expressly forbidden.

⁴⁰ 41 US 367 (1842)

All the abovementioned principles play a role in contributing to an effective wildlife management regime. However, their efficacy in North America cannot be compared directly to India for several reasons. One is the predominance of guns in North America. There are about 3 million hunters in the United States, with each having access to at least one firearm. In India there is a stigma attached to firearms and the process of acquiring a license and then a firearm is an arduous one. Another reason is the fact that Americans are more open to experimenting with their diets, while Indians are largely limited with theirs. However, most regions where human-wildlife conflict occurs have a history of hunting and consuming wild game, so the concept of sustainable harvest might be accepted with time.

These principles provide us with a wide range of tools to effectively administer animal populations. Individual principles maybe tweaked to be more effective in the Indian conservation framework. In cases where natural habitats have more animals than they can support, these excess animals maybe hunted and consumed by rural landowners when they stray onto agricultural land.

4.2 A Case Study on Human-Wildlife Conflict in India

This study by Krithi K. Karanth and Sahila Kudalkar examined 11 protected areas across the states of Maharashtra, Rajasthan, Madhya Pradesh, and Karnataka to assess the factors to be measured while determining the willingness of local to participate in conflict mitigation.⁴¹ The survey included around 5000 households across a range of geographic conditions. Around 72% of households surveyed reported some form of conflict with wild animals. Crop damage constituted 71% of all conflicts, followed by livestock predation which accounted for 17%. Injury to humans was reported in only 2% of all incidents and the loss of life occurred in less than 0.5%.⁴²

32 species in total were reported to conflict with humans across the survey sites. Wild boar were the worst offenders, being found in 10 out of 11 sites, followed by nilgai and

⁴¹ Krithi K. Karanth & Sahila Kudalkar (2017) History, Location, and Species Matter: Insights for Human–Wildlife Conflict Mitigation From India, *Human Dimensions of Wildlife*, 22:4, 331-346

⁴² Ibid.

elephants which were both recorded in 5 sites. Tigers, leopards, and the various wild canid species were found to be responsible for the highest rates of livestock predation. However, as carnivores cannot be consumed by humans, they will be excluded from the purview of my dissertation, alternative remedies can be used against them.

Average annual loss resulting from crop damage was INR 12,559 ranging from INR 4426 in Kanha to INR 24,687 in Sitamata. This shows a significant disparity that is based on various factors including animal density, crop density, availability of alternative food sources, effectiveness of mitigation measures, etc. When it comes to livestock predation, tigers and leopards were found to be responsible for 45% of all incidents. The average annual loss incurred from this ranged from a mere INR 663 in Sitamata to INR 13,948 in Nagarahole. Thus, we can see that the greatest losses due to livestock predation is around the same as the average losses due to crop damage. This clearly shows that herbivores are far more destructive to agriculture than carnivores.

Eleven mitigation measures were reported to be used by the sample size, including night-time watching, fencing and use of scare devices (firecrackers etc.). Night-time watching was the most popular and with good reason, as it can serve to effectively deter most wild animals. More than 80% of the surveyed households reported the use of multiple mitigation measures. Over the course of the study, the authors made several observations. It was found that households in areas with a history of conflict were more likely to take actions to protect their crops and livestock. Similar findings were reported in Kenya⁴³ and Sri Lanka.⁴⁴

It has also been theorized that households in areas with a history of conflict may be more averse to implementing alternative measures as they have already found what works for them.⁴⁵ However, continuing losses and depredation in the face of these mitigation

⁴³ Sitati, N. W., Walpole, M. J., & Leader-Williams, N. (2005). Factors affecting susceptibility of farms to crop raiding by African elephants: Using a predictive model to mitigate conflict. *Journal of Applied Ecology*, 42, 1175–1182.

⁴⁴ Fernando, P., Wikramanayake, E., Weerakoon, D., Jayasinghe, L. K. A., Gunawardene, M., & Janaka, H. K. (2005). Perceptions and patterns of human-elephant conflict in old and new settlements in Sri Lanka: Insights for mitigation and management. *Biodiversity and Conservation*, 14, 2465–2481.

⁴⁵ Karanth, K. K., & Nepal, S. K. (2012). Local residents perception of benefits and losses from protected areas in India and Nepal. *Environmental Management*, 49, 372–386.

measures shows us that it is essential to employ species-specific remedies to effectively manage this conflict.⁴⁶

It has also been found that mitigation measures are employed based on costs, rather than efficiency. The study found that multiple households had invested in the cheapest mitigation measures although other practices were clearly more effective. This points towards poverty and paints a vivid picture of how people living in conflict zones do not have adequate means to protect their property and livestock. To overcome this, they often invest in crude home-made traps which can have lethal effects on non-target species. These range from poisoning of carcasses with cheaply available chemicals such as strychnine, to rudimentary shrapnel filled pressure sensitive explosives, to snares and jaw traps. These illegal devices are terrible for ecosystems; they result in indiscriminate killing or maiming of whatever animal encounters them, regardless of whether that animal has ever been in direct or indirect contact with mankind.

From the data given above, we can infer the animals responsible for the most damage to agricultural activity here in India are the wild boar, nilgai and Indian elephant. The elephant is an endangered species and has been protected in India since the 19th century. In addition, they are not a viable source of nutrition as elephant meat is reportedly too tough for regular human consumption. To allow the killing of elephants, therefore, is completely out of the question. It is also an icon of Indian culture and even has a religious representation in the form of Lord Ganesha. As such, we must strive to preserve elephant populations and allow them to proliferate. To address man-elephant conflict, we will have to resort to non-lethal practices. Electric fences have proved to be particularly effective in elephant control.

The wild boar has been listed as a species of Least Concern by the IUCN. States such as Uttarakhand, Himachal Pradesh, and Telangana have declared them as vermin and authorized their killing in the past. Similarly, nilgai have also been declared vermin in states like Bihar. The damage they do to crops is just as bad, if not worse, than wild boar. However, many people express reservations about harming nilgai due to their cow-like appearance. In reality, nilgai are a species of antelope and are not at all related to cattle. When people get over their inherent cultural and religious biases, they will see begin to see controlling these problem animals comes with the reward of high-quality nutrition.

⁴⁶ Ibid.

Under the current legislative framework, however, even these species may not be consumed by those who hunt them. Wild meat is more nutritious and a far healthier alternative to store brought meat, which is often reared under unsanitary conditions and pumped with hormones. To allow these animals to go to waste is little more than sheer ignorance on the part of the Government. This change maybe affected by merely amending the WLPA with an express prohibition on the trade of such meat.

4.3 Conclusion

A reasonable and ethical approach to wildlife management involves selected hunting of problem animals on agricultural land. This gives the landowners the ability to selectively eliminate the target species while keeping others safe.

Under the current legislative framework, hunting of these animals is permitted under some circumstances but landowners are required to turn in the carcasses of animals shot to the Government for disposal. This is a sheer waste of resources, not only is it contradictory to the principles of sustainable harvest, but it also deprives these landowners (who often fall below the poverty line) of a valuable source of nutrition. It goes without saying that the Government must properly monitor such a system to ensure there is no misuse. They can issue permits to these landowners based on wildlife population surveys. Not only will this allow farmers to protect their crops and feed themselves in the process, but it will also reduce competition among the wild animals for limited resources.

Gun laws in India are quite stringent, and with good reason. However, it is much easier to obtain a gun as an agriculturist than as an ordinary citizen. The Government even offers subsidies in some cases for the purchase of “crop protection” firearms.

However, care must be taken to ensure non-target species are not killed. This can be done by employing a community-based conservation approach and rewarding individuals for

information about poaching and other illegal activities. Permits must also be regularly checked to ensure that any hunting of wildlife is done in accordance with the law.

One final consideration is the importance of educating the masses about the benefits of such a system. While the proposal and implementation of such a system would undoubtedly be met with significant resistance at first due to the religious and cultural beliefs of the majority, proper education, and awareness of the effectiveness of such a framework will go a long way in ensuring that there is willing community participation.

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