

WILDLIFE PROTECTION AND GENETIC FORENSICS: A CRITICAL EVALUATION OF THE WILDLIFE (PROTECTION) ACT, 1972 IN COMBATING ILLEGAL WILDLIFE TRADE IN INDIA

Shailesh Sachan¹, Dr. Shova Devi^{2*}, Dr. Rashmi Salpekar³

¹Research Scholar, Amity Law School, Amity University Uttar Pradesh (Lucknow Campus), Email id: shailesh.sachan@s.amity.edu, Orcid Id: 0000-0002-9318-1570

^{2*}Assistant Professor, Amity Law School, Amity University Uttar Pradesh (Lucknow Campus) Email id: sdevi@lko.amity.edu, Orcid Id: 0000-0001-8256-8369

³Professor and Dean, Vivekananda School of Law and Legal Studies, VIPS- TC, New Delhi, Email id: rashmi.salpekar@vips.edu, Orcid Id: 0000-0003-0935-4481

*Corresponding Author: Dr. Shova Devi, Email id: sdevi@lko.amity.edu

Abstract

The illegal wildlife trade is one of the most crucial transnational organized crime and has become a major environmental and criminal justice issue. Despite having a thorough legal framework under the Wildlife (Protection) Act, 1972, India, a country rich in biodiversity, continues to be threatened by illegal trafficking of protected species. The effectiveness of the Act in preventing the illegal wildlife trade is critically examined, with an emphasis on both its substantive provisions and enforcement strategies. Further, in wildlife conservation and law enforcement, the arena of 'genetic forensics' has emerged as a potential scientific instrument in preventing wildlife crimes and safeguarding endangered animals. The article analyzes institutional responses to wildlife crimes, judicial interpretations, and statutory provisions using a doctrinal and analytical methodology. And connects the probable role of genetic forensic in combating illegal trade. It also examines the function of law enforcement, the suitability of punishments, and the difficulties presented by new trafficking techniques, such as the use of internet platforms and international networks. The study highlights problems like lax enforcement, a lack of interagency collaboration, inadequate deterrent, and a restricted use of technical tools in monitoring and investigation, indicating a substantial gap between legal intent and actual execution. In an effort to evaluate compliance and determine best practices, the report also places India's legal system within a larger international framework, including the CITES. It contends that although the Act offers a solid legal basis, structural and operational flaws compromise its efficacy. In order, to prevent wildlife trafficking, the study's conclusion suggests specific legislative and regulatory changes. The purpose of this study is to add to the current discussion about environmental governance and the necessity of a stronger legal response to wildlife crime in India.

KEYWORDS: Wildlife (Protection) Act, 1972, Illegal Wildlife Trade, Enforcement Challenges, Wildlife Crime, Genetic Forensics, Environmental Law.

1. INTRODUCTION

Wildlife plays a vital function in maintaining life-support systems on Earth and is an essential component of ecological balance and biodiversity protection. India is home to a wide variety of plants and animals, making it one of the megadiverse nations in the world. However, wildlife populations are seriously threatened by growing human pressures such as habitat degradation, poaching, and illicit commerce. The Wildlife (Protection) Act, 1972 was passed by the Indian legislature in response to these difficulties, offering a thorough legal framework for the preservation and protection of wildlife. The Act has been modified over time to meet new issues, but the illegal wildlife trade still poses a serious risk, casting doubt on the efficacy of the current legal system. The concepts of wildlife protection go beyond just protecting species; it also includes maintaining biodiversity, protecting ecosystems, and preventing the exploitation of natural resources. The goals of wildlife conservation laws are to control how people interact with animals, forbid the hunting and trading of endangered species, and create protected places like national parks and sanctuaries. It represents a change from a utilitarian strategy that exploited wildlife for financial gain to a conservation-focused strategy that prioritizes ecological sustainability and environmental ethics.

The illegal harvesting, transportation, and selling of wildlife species and their byproducts, such as skins, bones, ivory, and pharmaceuticals, is referred to as the "illegal wildlife trade." It is a type of transnational organized crime since it frequently crosses national borders and operates through organized criminal networks. The illegal wildlife trade encompasses a wide range of animals, including exotic creatures trafficked for ornamentation and pets in addition to endangered species. The growth of digital platforms and the dark web in recent years have increased the scope and intricacy of wildlife trafficking, making enforcement and detection more difficult. The illegal wildlife trade continues in India despite the existence of a thorough legal framework, demonstrating a gap between the law and its application. Examining whether the legal measures under the Wildlife (Protection) Act, 1972 are effective in limiting such actions is the primary research problem of this study. It looks at how well institutional structures, sanctions, and enforcement strategies can handle the changing nature of wildlife crimes. The study also seeks to pinpoint the shortcomings and difficulties that impede successful execution.

The primary objective of this study is to assess the efficacy of the Act's enforcement mechanisms, investigate the kind and scope of the illegal wildlife trade, and critically review the legal framework controlling wildlife protection in India. It also seeks to pinpoint the flaws in the current system and suggest appropriate changes. The study is predicated on the idea that although the Wildlife (Protection) Act, 1972 has a solid legal basis, its efficacy is seriously compromised by lax enforcement, insufficient deterrence, and new technological obstacles that enable illicit commerce. Using a doctrinal and critical approach, this study mostly draws from secondary sources, including scholarly literature, government reports, court rulings, and statutes. Legal provisions and their actual application are critically examined using a qualitative method. A thorough grasp of the topic is provided by analyzing pertinent case laws and policy papers to comprehend judicial interpretation and enforcement patterns.

The scope of this research is limited to India's institutional and legislative framework for protecting wildlife, with an emphasis on the Wildlife (Protection) Act, 1972 and its function in stopping the illegal wildlife trade. It also takes into account current advancements and new trends, such as the employment of technology in crimes involving wildlife. However, due to underreporting of wildlife crimes, the study has several drawbacks, such as its reliance on secondary data and its lack of complete empirical statistics. Notwithstanding these limitations, the study seeks to offer significant insights into the efficacy of the current legal system and recommend reform strategies.

2. Legal Framework of Wildlife Protection in India

2.1 Evolution of Wildlife Laws in India

India's wildlife protection laws have changed significantly from a colonial, exploitation-focused system to one that is more focused on conservation. Rather than protecting biodiversity, legislation like the Indian Forest Act of 1927 were mostly passed during the British era to control forest resources for commercial usage. With little regard for ecological balance, wildlife was primarily seen as a resource for hunting and income generating. Legislative objectives had to change after independence due to growing awareness of environmental degradation and the sharp reduction in wildlife populations. Domestic wildlife regulations were significantly influenced by the worldwide environmental movement of the 1960s and 1970s as well as India's involvement in international conservation initiatives. Articles 48A and 51A(g) of the Indian Constitution established a constitutional obligation that further highlighted the responsibility of the State and its citizens to safeguard the environment and wildlife. In the end, this change resulted in the Wildlife (Protection) Act, 1972, which was a turning point in Indian environmental law.

2.2 Overview of the Wildlife (Protection) Act, 1972

The primary purposes of The Wildlife (Protection) Act, 1972 were to save animals and stop illicit hunting and trading. It establishes universal criteria for wildlife protection and offers a comprehensive legislative framework that is applicable throughout the entire nation. The Act allows for the creation of protected places including national parks, wildlife sanctuaries, conservation reserves, and community reserves. It also forbids the killing of wild animals and governs the ownership, trading, and transportation of wildlife and its derivatives. Additionally, it creates a multi-tiered governance framework by giving the federal and state governments the authority to take the required steps to safeguard animals.

The Act's purview has grown over time to cover new issues like international trafficking and organized wildlife crime. India's dedication to worldwide conservation efforts is seen in its integration with international commitments, especially under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).¹

2.3 Key Provisions and Schedules

The Act's classification of species under six Schedules, which establish the degree of protection granted to them, is one of its most important characteristics. The highest level of protection is granted to species included in Schedule I and Part II of Schedule II, with severe penalties for infractions. While Schedule V contains creatures categorized as vermin, which may be hunted under certain circumstances, Schedules III and IV offer relatively less protection. Certain plants are covered by Schedule VI, which places limitations on their commerce and cultivation.

Hunting of endangered animals is absolutely forbidden by the Act, with the exception of extraordinary situations like self-defence or scientific research, which require prior authorization. Additionally, it requires licenses and permits for all permitted activity and places rigorous limitations on trade and commerce involving wildlife. The Act aims to create a strong deterrent against wildlife crimes by imposing severe penalties, such as fines and jail, for violations. The Act also allows for the creation of protected areas, where human activity is either limited or controlled in order to maintain ecological integrity. Together, these clauses serve as the foundation of India's wildlife protection system.²

2.4 Role of Authorities and Institutions

A network of institutions and authorities at the federal and state levels is necessary for the Act to be implemented effectively. The National Board for Wildlife (NBWL), which advises the national government on policy issues pertaining to wildlife protection, is at the top. State Boards for Wildlife also serve as advisors at the state level. The Wildlife Crime Control Bureau (WCCB) was created as a specialist organization to support law enforcement, coordinate intelligence, and fight organized wildlife crime. The main enforcement agencies in each state are the forest departments, which are in charge of keeping an eye on protected areas, stopping poaching, and prosecuting violators. Addressing wildlife crime also requires the involvement of other players, such as police departments, customs authorities, and non-governmental groups.

¹ Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Mar. 3, 1973, 993 U.N.T.S. 243.

² The Wildlife (Protection) Act, No. 53 of 1972, INDIA CODE (1972).

However, issues including poor coordination, insufficient funding, and a lack of technical know-how frequently impede these institutions' ability to operate effectively.

2.5 Amendments and Recent Developments

The Wildlife (Protection) Act has undergone a number of revisions to improve its provisions and accommodate evolving situations. The 1991 amendment, which outlawed hunting entirely and increased fines, was a major change. The 2006 amendment strengthened institutional processes by establishing the Wildlife Crime Control Bureau and the National Tiger Conservation Authority (NTCA). More recently, the Wildlife (Protection) Amendment Act, 2022 brought about a number of significant modifications, such as more stringent management of invasive alien species, rationalization of schedules, and alignment with CITES rules. These changes show an attempt to update the legal system and deal with new risks like ecological imbalances and international animal trafficking.

Despite these advancements, questions about how well the law is being applied still exist. The Act's efficacy is still being undermined by problems including low conviction rates, protracted legal proceedings, and the growing complexity of wildlife trafficking networks. As a result, even though the legislative framework has changed significantly, strong enforcement and ongoing adaptability to new issues are ultimately necessary for its effectiveness.

3. Genetic Forensics in Wildlife Protection

In the fields of wildlife conservation and law enforcement, genetic forensics has become a potent scientific instrument that is essential to preventing wildlife crimes and safeguarding endangered animals. Global biodiversity is now seriously threatened by wildlife crime, which includes poaching, illegal hunting, animal part trafficking, and unapproved commerce in protected species. Despite strict legal precautions, the illicit trade in animal products, including tiger skins, elephant ivory, rhino horns, pangolin scales, and exotic birds, persists in India. A dependable and cutting-edge scientific approach to species identification, tracking the provenance of wildlife products, and bolstering criminal investigations pertaining to wildlife offenses is provided by genetic forensics. The use of molecular biology and DNA analysis methods in the investigation of crimes involving wildlife is known as genetic forensics. Genetic material from animal tissues, blood, hair, feathers, bones, tusks, horns, scales, or other biological samples is examined. Scientists can identify the species, place of origin, and even individual identities of animals engaged in illicit commerce by using DNA profiling. This data offers vital proof that can be used against criminals in court.

Species identification is one of the most important uses of genetic forensics. Wildlife traffickers frequently try to pass off legitimately tradable species as protected ones, making it challenging to identify them visually. Forensic specialists can precisely identify species from very tiny or damaged biological samples thanks to DNA-based methods like DNA barcoding. When working with processed wildlife goods, when conventional identification techniques might not work, this skill is especially helpful. Analysis of population and geographic origin is another crucial use. The precise population or area from which an animal or wildlife product originated can be identified with the use of genetic markers. This helps law enforcement find trafficking routes and hotspots for poaching. Authorities may create successful plans to stop the illegal wildlife trafficking with the help of this information, which also aids focused conservation activities.

DNA profiling is another way that genetic forensics helps with individual identification. DNA profiles can differentiate one species from another, much as human forensic examinations. This method is especially helpful in situations where the same people or populations are involved in recurrent infractions, ownership conflicts, or accusations of captive breeding. The prosecution's case can be strengthened by using DNA evidence to prove a direct connection between confiscated wildlife items and poached animals. Specialized organizations like the Centre for Cellular and Molecular Biology and the Wildlife Institute of India are increasingly supporting genetic forensic investigations in India. These organizations have created forensic techniques and genetic databases for a number of endangered animals. Their scientific knowledge helps courts, forest departments, and law enforcement organizations investigate wildlife crimes. The application of genetic forensics is fraught with difficulties despite its benefits. These include inadequate genetic databases for many species, a lack of educated workers, expensive DNA analysis, a lack of forensic infrastructure, and delays in receiving forensic reports. Legal institutions must also guarantee appropriate guidelines for the gathering, storing, and admission of genetic evidence in court.

An important development in conservation efforts is the incorporation of genetic forensics with wildlife protection legislation. Genetic forensics improves the efficacy of wildlife crime investigations and convictions by offering precise, impartial, and scientifically verifiable evidence. The application of genetic technologies will be crucial for bolstering wildlife law enforcement, safeguarding endangered species, and conserving biodiversity for future generations as the illicit wildlife trade grows more complex. The significance of genetic forensics in wildlife conservation and protection will be further strengthened by ongoing investments in forensic infrastructure, research, and capacity building.

4. Illegal Wildlife Trade in India

4.1 Nature and Types of Wildlife Trade

The illegal harvesting, ownership, transportation, and sale of wild animals, plants, and their derivatives constitute the illegal wildlife trade, which poses a significant environmental and criminal threat. The strong demand for wildlife products in industries like traditional medicine, fashion, luxury goods, and the exotic pet industry frequently drives this trade in India, which takes place through both domestic and international channels. This trade is highly structured and challenging to detect due to its clandestine nature; operations are often carried out through covert networks and intermediaries. Over time, the nature of the wildlife trade has changed substantially. Wildlife trafficking is becoming more marketed and associated with international organized crime, whereas previous cases were mostly locally and subsistence-based. India is a transit point for wildlife products headed for international markets in addition to being a source nation for a number

of endangered species. Despite the Wildlife (Protection) Act of 1972's stringent legislative limitations, this illegal enterprise is nonetheless encouraged by difficult enforcement and large profit margins.

Types of Wildlife Trade

The wildlife trade can be divided into a number of numerous groups according to its dimensions, purpose, and mode of operation. Analysing the intricacy of illicit wildlife markets and the difficulties they present for enforcement under statutes like the Wildlife (Protection) Act, 1972 requires an understanding of these categories.

- **Commercial Wildlife Trade:** This type of wildlife trade is the most structured, extensive, and profit-driven. Poachers, middlemen, and foreign customers are connected by well-established supply systems. Global black markets are used to trade valuable goods including ivory, rhino horns, tiger skins, and exotic animal parts. This kind of commerce produces a substantial amount of illicit income and is frequently associated with multinational organized crime.
- **Subsistence Wildlife Trade:** Local or indigenous groups who rely on wildlife resources for their livelihood generally engage in subsistence trading. This involves using animals in customs, hunting them for food, or selling animal parts on a small basis. Even if its scope is very small, if it is not controlled, it may nevertheless lead to the extinction of species. Importantly, larger trafficking networks frequently take advantage of these groups.
- **International (Cross-Border) Wildlife Trade:** This kind entails the unlawful cross-border transportation of wildlife and its derivatives. In international wildlife trafficking networks, particularly in South and Southeast Asia, India serves as both a source and a transit nation. Smuggling operations are made easier by porous borders and lax border restrictions. International frameworks such as CITES regulate this type of commerce, but enforcement is still difficult.
- **Exotic Pet Trade:** The illegal wildlife trade has greatly risen because to the demand for exclusive and rare pets. Big cats, parrots, tortoises, snakes, and monkeys are among the species that are seized and sold as pets. Animal abuse, subpar transportation, and high animal fatality rates are common in this trade. Additionally, by removing animals from their habitats, it disturbs natural ecosystems.
- **Trade in Animal Parts and Derivatives:** Animal body parts are extracted and sold as a significant portion of the wildlife trade. These consist of internal organs, horns, tusks, claws, bones, and skins. These products are utilized in ornamental objects, traditional medicine, and luxury goods. For instance, ivory is carved into decorations, and tiger bones are utilized in traditional medicine. Poaching and the extinction of species are directly impacted by this kind of commerce.
- **Plant-Based Wildlife Trade:** The unlawful trade in endangered plant species is included in the wildlife trade, which is not just about animals. Illegal harvesting and sale of rare medicinal plants, wood, orchids, and other flora occurs in both domestic and foreign markets. Particularly in forest settings, this type of commerce upsets ecological equilibrium and endangers biodiversity.
- **Marine Wildlife Trade:** This involves the illicit trading and harvesting of marine animals such sharks, corals, sea cucumbers, and decorative fish. Marine animals are frequently used for traditional medicine, aquarium trade, and food. This kind of trade is particularly challenging to control because marine habitats are not well monitored.

4.2 Major Trafficked Species

India is home to a variety of wildlife species that are increasingly targeted by illicit trade networks, making it one of the most biodiverse nations in the world. These species are trafficked because of the high demand for their body parts, medical worth, ornamental use, and as exotic pets in international markets. Poaching and smuggling continue to pose serious risks to a number of species, despite the Wildlife (Protection) Act of 1972 providing rigorous legal protection. Tigers are one of the most commonly trafficked species; they are hunted for their skins, bones, and other body parts that are utilized in luxury goods and traditional medicine. Elephants are also a popular target because of their ivory tusks, which are used to make ornamental objects. In a similar vein, rhinoceroses are stolen for their horns, which are highly prized in illicit global markets. With their meat regarded as a delicacy and their scales utilized in traditional medicine, pangolins have become one of the most trafficked mammals in the world.

Apart from large mammals, birds and reptiles are also heavily trafficked. While turtles and tortoises are traded as exotic pets and for food, snakes are targeted for their skins, which are utilized in the fashion business. Owls, mynas, and parrots are among the bird species that are abducted and sold in illicit pet marketplaces, frequently in cruel circumstances. Due to their commercial worth, marine species like corals and sea cucumbers are also targeted. Certain plant species, particularly rare medicinal plants and orchids, are frequently trafficked illegally in addition to wildlife. This illegal industry is nevertheless fueled by the rising demand for exotic pets and traditional medicines as well as lax enforcement. Strengthening conservation and enforcement measures is essential because the trafficking of these species not only jeopardizes their survival but also upsets natural balance.

4.3 Wildlife Trade Networks and Organized Crime

In India, the illegal wildlife trade has developed into a highly structured and organized type of transnational crime that is similar to other illegal enterprises like the trafficking of drugs and weapons. Local hunters, middlemen, transporters, dishonest officials, and foreign buyers are just a few of the many players that make up the well-established networks through which poaching currently operates rather than being restricted to isolated instances. The seamless transportation of animal goods from source to destination is ensured by these networks' chain-based structure, in which each member plays a distinct role. India is a major center in international wildlife trafficking routes due to its advantageous geographic location, especially when it comes to connecting markets in South and Southeast Asia. The smuggling of wildlife and its derivatives is made easier by porous borders with nearby nations like Bangladesh, Nepal, and Myanmar. To maintain their activities, organized crime syndicates take advantage of inadequate monitoring infrastructure, poor enforcement procedures, and a lack of interagency collaboration. These networks are further encouraged to participate due to their large profit margins and comparatively minimal conviction risk.

Furthermore, there is a growing connection between wildlife trafficking and other types of organized crime, such as corruption and money laundering. Detection is even more challenging because the illicit gains are sometimes directed through intricate financial systems. A legal foundation to counteract such crimes is provided by the Wildlife (Protection) Act, 1972, however its efficacy is nevertheless compromised by enforcement issues. A coordinated response combining several national and international authorities is required due to the organized nature of wildlife crime.³ To dismantle these networks and stop the illegal wildlife trafficking, it is essential to use cutting-edge investigative tactics and strengthen intelligence-sharing systems.

4.4 Socio-economic Factors Behind Wildlife Trade

Numerous socioeconomic variables contribute significantly to the illegal wildlife trade's continued existence in India. Local communities are frequently motivated to engage in illegal commerce and poaching due to poverty and a lack of alternate sources of income. Larger criminal networks frequently take advantage of these people, paying them little in exchange for taking on the legal dangers. The demand for wildlife items is also influenced by cultural customs and traditional beliefs. For example, the illegal trade is still fueled by the use of animal parts in traditional medicine and ceremonies. The issue has also been made worse by the rising demand from wealthy segments of society for luxury goods and exotic pets.

Another important factor is a lack of knowledge and instruction on wildlife conservation. The efficacy of laws is hampered by low community involvement in conservation initiatives and a lack of incentives for sustainable behaviour. Developing a comprehensive strategy to combat wildlife crime requires addressing these socioeconomic factors.

4.5 Role of Technology and Online Platforms

Technology has changed the nature of the illegal wildlife trade in recent years, making it more structured and challenging to identify. Social media, e-commerce websites, and encrypted messaging apps are just a few of the online venues that traffickers use to market and sell wildlife items. Because these platforms offer anonymity, criminals can operate with a lower chance of being discovered. When the dark web allows for encrypted and anonymous transactions, its growth has made enforcement operations even more difficult. Financial tracing is made more difficult by the introduction of digital payment systems and cryptocurrency to enable illicit activities. These findings draw attention to the connection between cybercrime and wildlife crime, which calls for the incorporation of technology into police tactics. However, technology may also be a very effective instrument for conservation. Artificial intelligence, satellite monitoring, and animal forensics are examples of cutting-edge methods that can help monitor illicit activity and bolster law enforcement. However, sufficient funding, technological know-how, and legal assistance are needed for the successful application of such technologies.

5. Enforcement Mechanisms and Challenges

5.1 Role of Enforcement Agencies

The efficiency of the many enforcement organizations tasked with stopping, identifying, and prosecuting wildlife crimes is crucial to the successful implementation of wildlife protection laws in India. The State Forest Departments, which serve as the front-line organizations for wildlife conservation, bear major duty. Under the Wildlife (Protection) Act of 1972, they are responsible for keeping an eye on protected areas, stopping poaching, making seizures, and filing lawsuits against violators. They are essential to protecting biodiversity because of their presence on the ground, despite the difficulties they frequently encounter, such as a lack of funding and labour. The Wildlife Crime Control Bureau (WCCB) is a key player in the fight against organized wildlife crime on a national scale. It works with state authorities, customs officers, and international organizations as a specialist intelligence and enforcement agency.

The WCCB helps trace international networks involved in wildlife trafficking, enables information exchange, and supports investigations. Enforcement activities are also greatly aided by other organizations including the police, border security forces, and customs authorities. While police departments support investigation and prosecution, customs personnel play a crucial role in identifying illicit wildlife items at ports, airports, and border checkpoints. Enforcement measures are further strengthened by cooperation with international organizations and adherence to international frameworks. Effective enforcement is frequently hampered by issues including poor coordination, overlapping authorities, and inadequate training, even in the presence of numerous agencies. Therefore, increasing capacity building, technological integration, and interagency coordination is crucial to raising the general efficacy of India's wildlife law enforcement.

5.2 Investigation and Prosecution of Wildlife Crimes

The effectiveness of wildlife regulations in India depends critically on the investigation and punishment of wildlife crimes. Because offenses under the Wildlife (Protection) Act, 1972 are cognizable and frequently non-bailable, law enforcement agencies can act quickly to punish violators. Forest officials, who have the authority to search, seize, arrest, and document evidence pertaining to wildlife offenses, are principally responsible for conducting investigations. The police and organizations like the Wildlife Crime Control Bureau (WCCB) are crucial in situations involving organized crime or interstate operations. The investigation method entails gathering tangible evidence, such as animal parts, poaching gear, and records pertaining to illicit trafficking. DNA analysis and animal forensics are two forensic methods that are being

³ United Nations Office on Drugs and Crime (UNODC), *World Wildlife Crime Report: Trafficking in Protected Species* (2020).

used more frequently to identify species and connect suspects to crimes. Effective investigation is frequently hampered by a lack of specialized training and inadequate forensic infrastructure.

It is the prosecution's responsibility to prove guilt beyond a reasonable doubt in competent courts where prosecutions take place. Due to procedural delays, insufficient evidence, and a lack of cooperation between prosecutors and investigating agencies, conviction rates are still comparatively low despite strict legal provisions.⁴ Enhancing deterrence and guaranteeing justice in wildlife crime situations requires bolstering investigative capability, enhancing evidence gathering, and guaranteeing prompt prosecution.

5.3 Challenges in Implementation

Even with a thorough legal framework, India's wildlife conservation regulations continue to suffer practical and structural difficulties. The lack of resources and skilled workers in law enforcement organizations, especially in the field, is a major problem. The main enforcement agencies, forest departments, frequently lack the manpower, cutting-edge tools, and logistical assistance necessary to properly monitor large and isolated forest areas. The lack of collaboration between various wildlife protection organizations, such as the police, customs officials, and specialized committees, is another significant issue. Enforcement delays and inefficiencies are sometimes caused by overlapping authorities and dispersed tasks. Additionally, the illegal wildlife trafficking might occasionally go unchecked due to corruption and local cooperation.

The deterrent effect of the law is undermined by protracted trials, procedural delays, and poor conviction rates in the legal system. Due to a lack of forensic infrastructure and technical know-how, obtaining admissible evidence is still challenging. Furthermore, the Wildlife (Protection) Act of 1972's old enforcement tools have been surpassed by new trends including online wildlife trade and the usage of digital platforms. Implementation is further complicated by socioeconomic considerations, such as poverty and reliance on forest resources. The effectiveness of wildlife protection laws will remain restricted unless these fundamental problems are addressed and institutional capacity is strengthened.

5.4 Case Law Analysis

By interpreting and extending the reach of the Wildlife (Protection) Act, 1972 and other constitutional provisions, judicial action has significantly strengthened wildlife conservation in India. The Supreme Court and other higher courts have often stressed the significance of maintaining ecological balance and protecting biodiversity. The Supreme Court addressed the problem of endangered species conservation, namely the Asiatic lion, in one of the most important cases: *Centre for Environmental Law, WWF-India v. Union of India*⁵. In order to safeguard the survival of the species, the Court ordered the relocation of lions from Gujarat to Madhya Pradesh and emphasized the importance of scientific and sustainable wildlife management. It reinforced the idea of intergenerational equity by highlighting the fact that wildlife is a national asset and cannot be restricted to a single state for exclusive benefit.

*State of Bihar v. Murad Ali Khan*⁶ is another significant ruling in which the Supreme Court closely interpreted the Act's terms to guarantee its efficient enforcement. The Court ruled that because violations of the Act affect ecological equilibrium, they must be taken seriously. It strengthened the efficacy of prosecution by emphasizing that the goal of wildlife protection should not be undermined by procedural complexities.

The Court tackled organized wildlife crime involving a well-known wildlife trafficker in *Sansar Chand v. State of Rajasthan*⁷. The ruling called for harsh penalties and improved enforcement methods, highlighting the growing connection between organized crime and the wildlife trafficking. The Court further noted that crimes involving wildlife have a significant impact on biodiversity and need to be dealt with harshly in order to have a deterrent effect. The case also discuss about very important perspective on genetic forensic in India, Sansar Chand engaged in the illicit trading of leopard and tiger pelts as well as other animal items. Forensic specialists employed DNA-based identification methods during investigations to confirm that the confiscated animal parts belonged to species that were protected by the Wildlife (Protection) Act, 1972. By establishing the species in question and connecting wildlife items to protected animals, genetic evidence bolstered the conviction. The case demonstrated how crucial forensic science is to wildlife law enforcement.

Similar to this, the Supreme Court delivered a number of rulings in *T.N. Godavarman Thirumulpad v. Union of India*⁸ that indirectly improved wildlife protection even though the case was mostly about forest conservation. The case resulted in ongoing judicial oversight of forest and wildlife conservation initiatives, guaranteeing more stringent adherence to environmental regulations.

Together, these rulings show how the judiciary takes the initiative to close gaps in legislation and enforcement. The legal foundation for wildlife conservation in India has been greatly strengthened by the courts' adoption of an eco-centric approach and emphasis on constitutional duties under Articles 48A and 51A(g).

6. Critical Analysis of the Effectiveness of the Act

6.1 Evaluation of Legal Provisions

A thorough legal framework for the preservation and protection of wildlife in India is established under the Wildlife (Protection) Act, 1972. Key components of its legislative framework include the outlawing of hunting, the regulation of trade and commerce in wildlife and its derivatives, and the establishment of protected areas, such as national parks and

⁴ See Divya Vasudev et al., *Addressing Wildlife Crime in India*, 45 Econ. & Pol. Wkly. 23 (2010).

⁵ *Centre for Environmental Law, WWF-India v. Union of India*, (2013) 8 S.C.C. 234 (India).

⁶ *State of Bihar v. Murad Ali Khan*, (1988) 4 S.C.C. 655 (India).

⁷ *Sansar Chand v. State of Rajasthan*, (2010) 10 S.C.C. 604 (India).

⁸ *T.N. Godavarman Thirumulpad v. Union of India*, (1997) 2 S.C.C. 267 (India).

wildlife sanctuaries. A graduated level of protection is ensured by the classification of species under several Schedules, with Schedule I species enjoying the highest level of legal protection. From a doctrinal viewpoint, the Act exhibits a strong conservation-oriented approach, in line with constitutional demands under Articles 48A and 51A(g), which highlight the State's and citizens' obligations to safeguard the environment. In an effort to limit exploitation while guaranteeing sustainable management of animal resources, the Act also includes regulatory systems like licensing, permits, and penalties.

However, some restrictions make it less effective. Despite being thorough, the Schedule system has come under fire for taking too long to update species classifications in response to evolving conservation requirements. Furthermore, the Act places little emphasis on decentralized governance and community involvement in favour of a centralized, command-and-control paradigm. Conflicts between local subsistence demands and conservation goals frequently result from this. Furthermore, despite the harsh laws pertaining to trade restrictions, their practical impact is diminished by the inconsistent enforcement of these provisions. Therefore, even while the Act has a strong legal basis, its efficacy depends on prompt reforms, flexible processes, and better implementation techniques.

6.2 Effectiveness of Penalties and Deterrence

Strict penalties are outlined in the Wildlife (Protection) Act of 1972 to prevent wildlife crimes, especially those involving animals included in Schedule I and Part II of Schedule II. These punishments include significant fines and detention, which can last for several years. Such stringent laws are intended to have a powerful deterrent impact and dissuade individuals and organized groups from participating in poaching and illicit wildlife trading. From a legal standpoint, the framework for penalties seems appropriate and commensurate with the seriousness of the offenses. As the severity of wildlife offenses has increased, amendments have improved penal measures even more. Additionally, the Act designates some offenses as cognizable and non-bailable, enabling law enforcement to act quickly. In actuality, though, these sanctions' deterrent power is still quite small. The impact of the law is greatly diminished by low conviction rates, drawn-out court cases, and difficulties gathering evidence. In order to lessen the possibility of punishment, offenders frequently take advantage of procedural flaws and delays. Furthermore, especially for organized crime networks, the tremendous profitability of wildlife trafficking continues to exceed the perceived risks.

In *Sansar Chand v. State of Rajasthan* in particular, judicial judgments have highlighted the necessity of strong enforcement to guarantee that fines function as an effective deterrence. As a result, even though the laws pertaining to punishment are strong, their efficacy ultimately rests on effective enforcement, quick trials, and higher conviction rates.

6.3 Gap Between Law and Practice

The ongoing imbalance between the Wildlife (Protection) Act, 1972's legal requirements and their actual application is a crucial factor in evaluating the act's efficacy. Although the Act offers a robust and all-encompassing framework for the conservation of wildlife, poaching, illicit trafficking, and habitat destruction continue to occur on the ground. This discrepancy exposes structural flaws that compromise the law's stated goals. The insufficiency of enforcement authorities is one of the main causes of this disparity. The inability of forest departments and associated agencies to adequately monitor large forest regions and stop illicit activity is frequently caused by a lack of modern equipment, inadequate financing, and a paucity of trained personnel. Furthermore, there is still a lack of coordination between many agencies, including the police, customs, and wildlife officials, which results in ineffective enforcement and investigation.

The gap is further exacerbated by procedural issues in the criminal justice system. Inadequate evidence gathering, protracted trials, and investigation delays all contribute to low conviction rates, which diminishes the law's deterrent power. The illegal wildlife trade is sometimes made possible by corruption and local cooperation. Furthermore, some groups are forced to participate in illicit activities due to socioeconomic factors, such as poverty and reliance on forest resources. This problem is made worse by the lack of inclusive and community-based conservation strategies. Therefore, in addition to increased enforcement, institutional changes and socioeconomic measures are needed to close the gap between law and practice.

6.4 Comparative Analysis with International Standards (e.g., CITES)

International conservation commitments, especially the CITES, have a major impact on India's wildlife protection policy under the Wildlife (Protection) Act, 1972. CITES is a multilateral agreement designed to prevent international trading in wild animal and plant specimens from endangering the existence of these species. It functions via a system of Appendices (I, II, and III) that categorize species according to the degree of protection needed and control their trade using a permit-based system. According to a comparative research, the goals and regulatory framework of the Indian legal system are largely similar to those of CITES. Similar classification systems are incorporated into the Wildlife (Protection) Act's Schedules, which offer different levels of protection to different species. In keeping with India's commitment to combating global wildlife trafficking, the Act also places stringent limitations on the export and trading of endangered species. This alignment has been further strengthened by recent changes, especially the Wildlife (Protection) Amendment Act, 2022, which introduced provisions to better regulate foreign commerce and rationalized schedules. When compared to international norms, there are still some gaps, nevertheless. Although CITES places a strong emphasis on international cooperation, monitoring, and reporting, India's enforcement systems frequently struggle with capacity, coordination, and technology integration. According to CITES rules, the deployment of permit systems and real-time tracking of wildlife trading is not as efficient. Additionally, porous borders and a lack of bilateral collaboration with neighbouring nations continue to make cross-border policing difficult.

Institutional efficiency is another area of disagreement. To guarantee compliance and a scientific evaluation of the effects of trade, CITES mandates the designation of Management and Scientific Authorities. Similar organizations have been

founded in India, although regulatory delays and resource limitations occasionally impede their ability to operate. In conclusion, India's domestic laws show strong adherence to international norms, especially CITES, but implementation issues limit their efficacy. To fully achieve the goals of both national and international wildlife conservation regimes, it is imperative to integrate cutting-edge monitoring technology, strengthen institutional capacity, and improve cross-border collaboration.

7. CONCLUSION

The aforementioned study shows that India's initiatives to protect biodiversity and stop the illegal wildlife trade have reached a major legislative milestone with the Wildlife (Protection) Act, 1972. The Act offers a thorough legal framework that includes trade control, species classification, hunting prohibition, and protected area creation. It has been reinforced over time by a number of modifications that reflect both India's increasing dedication to environmental conservation and the changing nature of wildlife crimes. The Act mostly complies with international responsibilities, especially those under the CITES, and constitutional duties. However, there are still a lot of gaps between the law and reality, which limits the Act's ability to stop the illegal wildlife trade. Despite the strength of the statutory requirements, structural and operational issues make it difficult to put them into practice. The ability of enforcement agencies to successfully monitor and manage wildlife crimes is sometimes hampered by a lack of resources, manpower, and technical competence. The issue is made worse by the various authorities' lack of collaboration, which results in ineffective investigation and prosecution.

Genetic forensics offers precise, dependable, and scientifically verified techniques for identifying and looking into animal crimes, it has become a game-changing instrument in wildlife protection. Genetic forensics improves the conviction of criminals engaged in the illicit wildlife trade and supports the enforcement of the Wildlife (Protection) Act, 1972 using methods like DNA barcoding, species identification, population analysis, and individual DNA profiling. The sophistication of wildlife trafficking networks has made it difficult to obtain compelling proof using standard investigation techniques alone. By making it possible to precisely identify protected species and track the source of wildlife products, genetic technologies help close this gap. However, better laboratory facilities, specialized training, extensive genetic databases, and closer collaboration between academic institutions and law enforcement agencies are necessary for the efficient application of genetic forensics. In addition to enhancing the detection and prosecution of wildlife crimes, integrating cutting-edge forensic science with legal and conservation frameworks will make a substantial contribution to India's sustainable environmental governance and biodiversity conservation. The effective fusion of law, science, and technology to counter the escalating menace of illegal wildlife trade is the key to the future of wildlife conservation.

The low conviction rate in wildlife crime cases is another serious problem that compromises the law's ability to prevent crime. Even with severe fines, the chances of a successful prosecution are decreased by inadequate use of forensic equipment, poor evidence collecting, and procedural delays. Simultaneously, the growing complexity of wildlife trafficking networks—which are sometimes associated with international organized crime—presents fresh difficulties that conventional police methods find difficult to handle.

The report also emphasizes how socioeconomic issues contribute to the illegal wildlife trafficking. Some populations participate in poaching and associated activities because to poverty, a lack of other sources of income, and a lack of understanding. The efficacy of legal measures is further undermined by the lack of inclusive conservation strategies that incorporate local communities within the protection system. Achieving long-term conservation goals requires addressing these fundamental problems. Furthermore, the dynamics of the wildlife trade have changed due to the quick development of technology, with illicit transactions using digital tools and internet platforms. Although this creates additional difficulties, it also presents chances to improve enforcement by utilizing data analytics, artificial intelligence, and animal forensics. Keeping up with changing trends requires incorporating such technologies within the legal and enforcement framework.

In conclusion, even if the Wildlife (Protection) Act, 1972 offers a solid legislative basis for wildlife conservation in India, its effectiveness mostly rests on institutional development, adaptive changes, and efficient implementation. To stop the illegal wildlife trafficking, a comprehensive strategy combining strict law enforcement with technical innovation, interagency cooperation, and community involvement is crucial. The efficacy of the legal system will be further increased by bolstering international collaboration and bringing national practices into line with international norms. India can only guarantee the preservation of its rich wildlife legacy for future generations by employing such a multifaceted approach.

REFERENCES

1. The Wildlife (Protection) Act, 1972, No. 53 of 1972, INDIA CODE (1972).
2. CITES, Mar. 3, 1973, 993 U.N.T.S. 243.
3. Ministry of Environment, Forest and Climate Change, Government of India, Wildlife Protection Act, 1972 with Amendments (2022).
4. Wildlife Crime Control Bureau (WCCB), Annual Report on Wildlife Crime in India (latest available edition).
5. National Crime Records Bureau (NCRB), Crime in India Report (latest edition, wildlife crime data section).
6. United Nations Office on Drugs and Crime (UNODC), World Wildlife Crime Report: Trafficking in Protected Species (2020).
7. Sansar Chand v. State of Rajasthan, (2010) 10 S.C.C. 604 (India).
8. State of Bihar v. Murad Ali Khan, (1988) 4 S.C.C. 655 (India).
9. Centre for Environmental Law, WWF-India v. Union of India, (2013) 8 S.C.C. 234 (India).
10. T.N. Godavarman Thirumulpad v. Union of India, (1997) 2 S.C.C. 267 (India).
11. K.D. Gaur, Textbook on Environmental Law (LexisNexis, latest ed.).
12. Shyam Divan & Armin Rosencranz, Environmental Law and Policy in India (Oxford University Press, latest ed.).

13. Wildlife Forensic Sciences: A Tool to Nature Conservation towards a One Health Approach [2022], DOI:10.3390/forensicsci2040058
14. Wildlife DNA forensics - bridging the gap between conservation genetics and law enforcement [2009], DOI:10.3354/esr00144