

An analysis of illegal wildlife trade with the aid of social media and prevention strategies

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Abstract

The drastic reduction of the wildlife populace indicates the true scale of illicit trade in wildlife. The traffickers emerged in the form of organized crime and threaten the survivability of several species across the world. Developing countries like India cannot be able to enforce the laws strongly to eradicate illegal wildlife trade. The regulations are poorly communicated and executed. The legalization varies from nation to nation. The political influences also affect the investigations of IWT. The traffickers misuse technology and sell illegal wildlife products in the pseudo name. This study investigates the role of social media platform in analyzing the illegal wildlife trade (IWT) and also suggest prevention strategies to conserve the wildlife environment. The research design is exploratory and descriptive. The research performs a quantitative analysis using the SPSS version 23 software package, through reports generated by the Wildlife Crime Control Bureau (WCCB). The report derived from the operation WILDNET is used to gather the data of cases registered through various social media platforms such as Facebook, Twitter, and WhatsApp. The present study adopts secondary data collection to fetch data relating to the prevalence of IWT throughout India. Descriptive statistics, Pearson correlation, and ANOVA tests are performed in the research. The outcomes of the study revealed the prevalence of IWT across India and the role of social media in identifying wildlife traffickers. Furthermore, the study concludes that the digital platform has aided in increasing awareness to conserve endangered species throughout the world.

Keywords: Wildlife trade, Wildlife crime, Conservation, Endangered Species, India

Introduction

Wildlife crime is defined as contrary actions to flora and fauna committed against international as well as national laws. The regulations are framed to conserve natural resources and manage their

sustainability (Anagnostou, Moreto, Gardner, & Doberstein, 2021). The trafficking refers to the illegal trade of wild plants and animals either as live or dead specimens or their parts (Marković, 2021). It hurts the biodiversity, environment, governance, and economies. Organized crime exists all over the world and involves smuggling, poaching, and illegal collection of conserved wildlife. According to the reports of WWF-World Wide Fund for Nature, wildlife smuggling occupies the fourth rank in organized crime across the world. It is worth 15 billion dollars per annum (Nuha). India ranks among the top twenty countries for wildlife smuggling. India constitutes 8% of wildlife in the world. Due to its dense population, India acts as a both source and transit country for illegal wildlife products (Singh, Sethy, & Chatrath, 2023).

In developing countries like India, wildlife crime is a persistent problem that damages ecosystems, affects the living standards of rural communities, and also impacts food security. The cross-border trafficking of live plants as well as animals resulted in the spread of contagious diseases through infected faunas and floras (Auliya, Altherr, Nithart, Hughes, & Bickford, 2023). The major wildlife crimes in India are the poaching of rhinos, tigers, and star tortoises (Aguirre, Catherina, Frye, & Shelley, 2020). The bones and skin of the tigers are catered in an illegal market. The body parts of tigers are used for manufacturing medicines and claws are utilized for making jewelry. The whiskers of the tiger are dreadful toxic material in Malaysia and act as an aphrodisiac in the nation of Indonesia. The trade routes for spices, salt, and wool are used to traffic the skins and bones of the tiger. It is exported mainly to North India and then outside the national borders through couriers. The main path is via Nepal, a porous border or China. Currently, it is transported through Myanmar.

Apart from the tiger, the major crime performed against the Indian Rhino. It is exported to Nepal, Bhutan, and Bangladesh. The current populace of Rhino dwindling today and only 2500 survive in India (Pant, Maraseni, Apan, & Allen, 2020). It became an endangered species due to illegal trade. Star Tortoises are illegally traded because people believe they will provide prosperity in one's life if it is chosen as a pet. Social media sites such as Facebook, Twitter, and Instagram have been at the forefront of the emergence of illegal wildlife trafficking of extinct flora and fauna (Feddem, Harrigan, Nekaris, & Maghrifani, 2020). The identification of sale animals is performed by a single click in an online platform. The traffickers post their advertisements of illegal products along with their contact numbers. Accessibility and anonymity are the two main crucial factors of social media. The traffickers reach the global market with the support of social

media and construct relationships with the customers (Di Minin, Fink, Hausmann, Kremer, & Kulkarni, 2021). The public access to the exotic animal generates demands of the specific species. The government of India has established the WCCB-Wildlife Crime Control Bureau under the Ministry of Environment, Forest and Climate Change to battle against the organized crimes of wildlife. Wildlife Protection Act of 1972 has been amended by the Indian Government for the welfare of wild plants and animals (Bhati). It provides the legal framework for the conservation of wild plants, animals, and products obtained. It prohibits hunting and protects the wildlife habitat. It helps in regulating and controlling the trade of parts and products derived from the wild flora and fauna.

Problem identification

Illicit wildlife trade (IWT) hurts the animal populace and environment. It facilitates the generation of climate variation, biodiversity loss, environmental degradation, and invasive species. It can also harm human communities through the spreading of zoonotic diseases (Bezerra-Santos, Mendoza-Roldan, Thompson, Dantas-Torres, & Otranto, 2021). It has been highly debated during the period of COVID-19. IWT threatens socio-economic growth, national security, and environmental conservation. The high revenues fetched from IWT lead to strong demand in the global market for wildlife products. Due to their significant application in medicine, drugs, fashion, culture, and status symbols, IWT ranks high among drug, weapon, and human trafficking (Anagnostou & Doberstein, 2022). These characteristics make the IWT a profitable business and act as a base for other crimes. The typical uses and demands of wildlife products attract illegal organizations to participate in illegal hunting and trading activities.

The available data cannot be able to estimate the true value of illegal trade occurred in the nation. It is difficult to segregate the wildlife products according to their application. Some are used as medicine while others are used as exotic pets. It is tedious for the authority of the government to format the crime accordingly. IWT is a global issue that covers almost 150 nations in the world (Keskin et al., 2022). The creation of legalization is a main challenge to prevent illegal trade in various nations across the world. IWT is often considered to be a less serious crime rather than drug and weapon trafficking. Most of the transactions are performed through social media and the identification of IWT will be simpler. It provides a pathway to eradicate them.

Significance of the study

Figure 1 depicts the statewide spreading of IWT traffickers in India. The yellow-colored states indicate the moderate existence of IWT in the regions. Andhra Pradesh, Karnataka, Gujarat, and Uttar Pradesh are the states where the IWT occurred at a moderate level. The Orange colored states indicated the IWT occurrences at the extreme level. Tamilnadu, Maharashtra, and West Bengal come under extreme-level zones. The Green color indicates the low level of prevalence of IWT. Therefore, from the above map, it can be proven that the IWT occurred in almost all the states of India, and only the level of occurrences is varied (Pragatheesh, Deepak, Girisha, & Tomar, 2021). Various investigators have highlighted the prevalence of illicit wildlife trade and their consequences on the nature and environment(Xu, Cai, & Mackey, 2020). IWT is a global issue and the conserved flora and fauna are affected by the poachers. The demand for elephant ivory, horns of rhinos, and scales of pangolins leads to the poaching of these animals in Asia. Social media aids in the illegal trading of wildlife in the global market. The Agency of Wildlife Conservation establishes amendments to control and regulate the organized trading of wildlife products. The lack of reliable data and the seriousness of the issue leads to failure in the prohibition of IWT. Moreover, the legalization is not properly amended throughout the nation. The nation will finally face the situation of existing abundant species transforming into extinct ones. Indian Government should be awakened to demolish IWT and conserve the wildlife species for the sustainability of a long-term healthy human community on Earth.

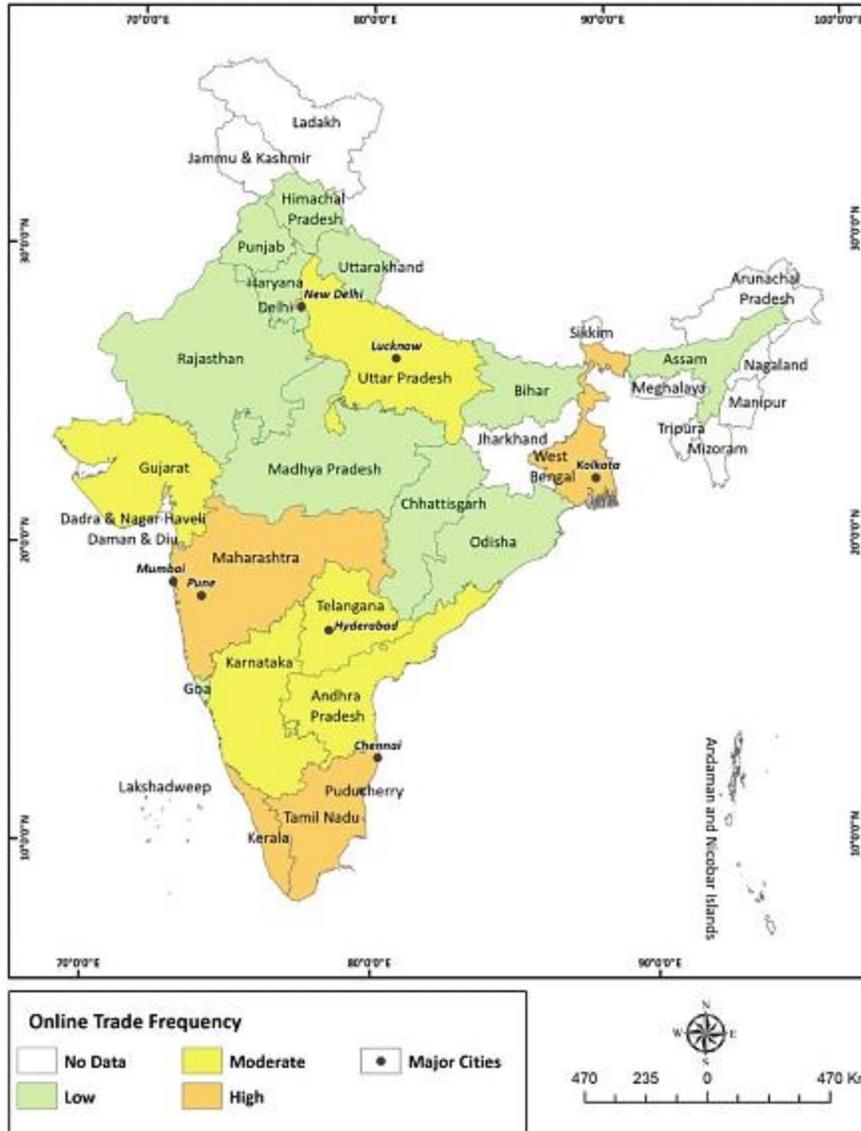


Figure 1. State-wise distribution of wildlife traffickers in India (Pragatheesh et al., 2021)

Research objectives

The present study emphasizes estimating the occurrences of illegal wildlife trades in India through social media and prevention strategies. The main objectives of the study are,

- ✓ To illustrate the illegal wildlife trade in India and its impact on the endangered species
- ✓ To analyze the prohibited trade of wildlife through social media in diverse countries
- ✓ To investigate the process involved in the illegal marketing of wildlife and their transaction procedure
- ✓ To recommend the strategies for prevention of illegal trade and provide a pathway for wildlife conservation

The paper is organized in the following manner Section 1 provides an elaborated introduction to concepts of illegal wildlife trade and the role of social media in preventing wildlife smuggling. Also, the introduction section depicts the significance of the research. The existing research scholarly works associated with the present study are reviewed in section 2. The current study research methodology is elucidated in section 3 and the analysis result is presented in section 4. The discussion and the limitations of the study are displayed in section 5. Finally, section 6 briefs about the conclusion and future recommendations of the study.

Wildlife Crimes

The poaching of extinct species doesn't gain prominence. However, on the contrary, the poaching of abundant species constitutes significance as it intimidates becoming extinct. The extinct species are transformed into local marginalized species. The existing study (Chawla et al., 2020) focuses on the less aware species of Golden Jackal scientifically referred to as *Canis aureus*, which is illegally poached and traded in the Indian market. The study insists upon the IWT of jackal horn in an Indian market, which is underreported. The reports from Government data reveal the seizure of 8 tails, 126 skins, 370 horns of Jackal, 16 skulls, and 2 jackals from the year 2013 to 2019. The horns of jackals are considered to be superstitious by the religious community. Therefore, the demands are elevated, and it results in the poaching and trading of Jackal in Asian markets. The conventional study concludes that efforts should be taken to identify the demand and supply chains of IWT of rare species and helps in conserving the extinct species.

The traffickers are knowledgeable and modify their trends to sell the wildlife species. The existing study (Sharma et al., 2019) investigates the online product namely "Hatha Jodi". It significantly means "paired arm" and is declared as a root of the plant. The morphological characteristics of the samples are analyzed. The results from the analysis conclude that it is intermittent organs of the monitor lizard. It denotes the hemipenis part of the lizards. Hatha Jodi is a superstitious plant originated in India and Nepal and is utilized in traditional practices. The traffickers duplicated the hemipenis part of the lizard into Hatha Jodi. The wildlife agency further analyzes the product through mitochondrial DNA sequencing and compares it with the original plant sequence. Then, finally, it has been found that it is the biological samples of the lizard. And so, it is demonstrated the illegal trade of extinct species of lizard with the help of modern technology. The illegal trade of extinct species with misleading names imposes a complicated challenge for battling against crime in wildlife.

The widespread poaching of species leads to the decline of species populace in the nation. The demand for bears is high due to the utilization of gallbladder and bones in traditional medicine. The existing study (Gomez, Wright, Shepherd, & Joseph, 2021) focuses on the seizure of bear species in India from the year 2009 to 2019 to estimate the impact of IWT on the bear population. Wildlife Protection Society of India (WPSI) gathers data on poaching as well as seizures of extinct species and categorizes it in the wildlife database. The report reveals the exploitation of bears for medication purposes. The poaching incidents are elevated day by day. The conflict of human and bears has increased due to the loss of habitat and human encroachment in wildlife regions. The conventional study insists that efforts are required to demolish the illegal trade of bears in India. The trade of bears should be monitored on a wide scale to support law enforcement for the reduction of poaching bears in India.

Prevention of IWT with the aid of social media

IWT is a crucial threat to global wildlife protection efforts. Traffickers enter digital platforms to sell illegal wildlife products. The existing study (Xu et al., 2020) focuses on IWT posts on popular social media networks such as Facebook, Twitter, and Instagram in Chinese languages. It utilizes big data approaches to characterize and identify the trading activity of wildlife in the Chinese language. It incorporates a web scraper and identifies keywords related to rhinos, elephants, and turtles. The study analyzed 10,303 posts on Facebook for forty-five days and found that 639 posts were from 268 users of IWT who are selling illegal products directly on online platforms. Facebook is considered to be a dominant platform for IWT. Traffickers use code words or emojis to sell products without any interruptions. Law enforcement, incorporating big data techniques, and civil society are collectively required to detect and prohibit Chinese-oriented IWT.

Social media platforms are essential channels for information, communication, and social interaction. They also provide opportunities for illicit trading of products. The existing study (Xu, Li, Cai, & Mackey, 2019) focuses on the Twitter platform and analyzes IWT through the API-Application Programming Interface. It detects and segregates messages of IWT on Twitter through the incorporation of machine learning with keyword filtering. Prohibited animals such as elephant ivory and pangolin are chosen as keywords, and 138,357 tweets were analyzed for 14 days. It was found that 53 tweets are suspected from 38 users related to IWT of ivory products. The integration of machine learning and analysis approaches has the capability to detect illegal content in the

training dataset. The technology helps organizations identify IWT on the digital platform and demolish online wildlife trafficking.

Material and methods

The quantitative method approach is adopted in this research. Quantitative research describes occurrences by gathering numerical, unchangeable, detailed data, which is estimated using mathematical methods. This, in turn, provides statistics related to questions of what, when, where, how, how many, and how much. It involves logic, numbers, and an objective stance (Baur). Quantitative research analysis is an innovative approach through which an investigator interrogates a particular question, gathers quantifiable data from respondents, estimates those numbers using statistics, and conducts the inquiry in an objective and unbiased manner (Mohajan, 2020). This quantitative research uses reports of illegal trade from the Wildlife Crime Control Bureau for the years 2017 to 2020 (Sürücü & MASLAKÇI, 2020). The research uses quantitative data gathered through reports from the webpage. The research instrument used in this study reports, helping to capture data regarding knowledge, information, and awareness about illegal wildlife trade occurrences through social media and its impact on endangered species in India. The reports are collected from the Wildlife Crime Control Bureau, covering all states in India.

Secondary data, collected from previously collected and freely accessible sources, are referred to as secondary data (Hasan, Popp, & Oláh, 2020). Researchers refer to and gather existing data based on the study's purpose, using it for their research. Secondary data include expert opinions about the research purpose, supporting the specificity of primary data collection. It helps identify gaps and scarcities and collect further needed data. Expert opinions are collected from existing literature, traditional magazines, journals, and articles (Hailu & Bushera, 2020). The current research uses secondary data to analyze the existence of illegal wildlife trade in India with the support of social media. The secondary data derived was utilized for the study and will be assured that the data gathered is strictly for educational use and all the particulars will be kept confidential.

Data analysis

Quantitative research analysis (Jung, 2019) is described as a systematic phenomenon by collecting data and executing mathematical, statistical, and computational methods. The quantitative method fetches data from conventional and prospective management employees utilizing sampling techniques and providing online research, polls, surveys, etc. The results are determined numerically. After careful interpretation, these numerals are used to predict or evaluate the future of research and make the necessary changes (Kafle, 2019). With the support of reports, quantitative

methodology is utilized for the data analysis. The data is recorded using an Excel sheet to reveal the association among the variables. The software tool SPSS is used for the subsequent estimation stage to analyze the variables entered in Microsoft Excel (Purwanto, Asbari, Santoso, Paramarta, & Sunarsi, 2020). The outcomes are estimated using five evaluation approaches. The methods used by the researchers are regression, correlation, and descriptive statistics, frequency distribution, and ANOVA analysis (Liang, Fu, & Wang, 2019).

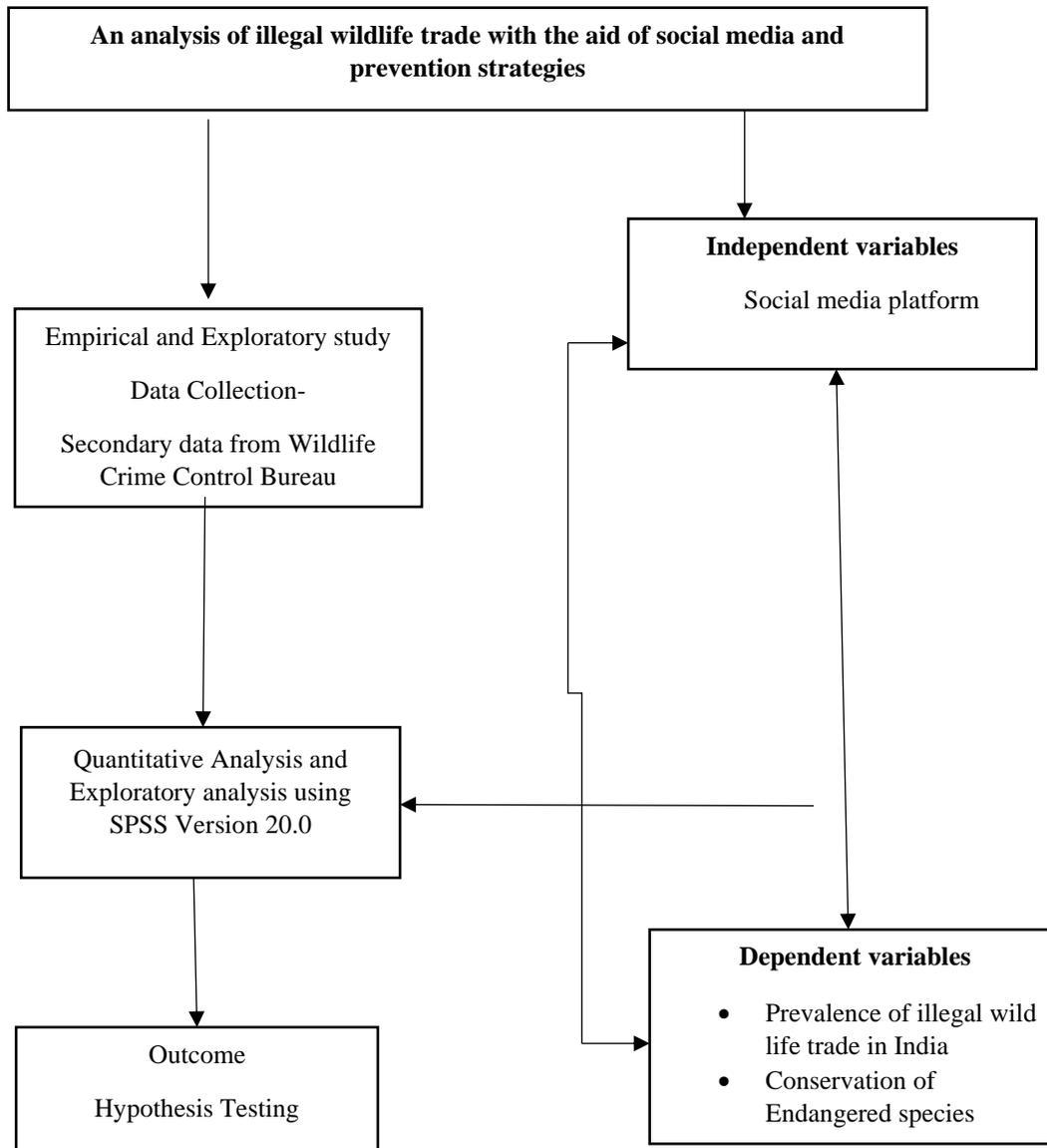


Figure 2. Research study design

The data is collected from the reports of Wildlife Control Bureau in the operation of WILDNET, India. Correlation is applied to describe the association between the two variables. Regression is

implemented to represent the influence of a single variable upon other variables. ANOVA is a statistical tool used to find the difference between the means of two independent collections by analysts. Descriptive statistics denotes the representation, collection, and formation of data. It is employed for briefing the characteristics of data sets. Frequency distributions are defined as the visual displays that form frequency counts, and this helps the information to be understood more thoroughly. The process involved in the research is illustrated in Fig. 2.

The use of SPSS software in this research makes the results effective and consistent in counting the values. The collected data was enumerated with the usage of Excel and SPSS software. Correlation, Regression, and ANOVA are accomplished to evaluate the organized hypothesis. The data estimation comprises 3 levels, namely, Microsoft Excel is used to incline the demographic variables, and the design of frequency distribution is done. To list the data analyzed by statistics to predict the median range and the mean and standard deviation of several variables in this research is a significant step. Hence SPSS software is employed in this research. Regression, Independent T-Sample test, ANOVA, and Correlation evaluation are employed to evaluate the research hypothesis.

Results

Reports from open-source databases

The secondary data is collected from the operation of WILDNET carried out by WCCB. The reports are generated from the year of 2017 to 2020. The cases registered in WCCB the species encountered and the number of arrests are depicted in the reports. The data fetched from the reports are analyzed and interpreted in the following section.

Regression test

The regression test is performed to analyze the association between the dependent and independent variables. The regression technique is utilized to calculate the strength of a relationship between one dependent and independent variable (Astivia & Zumbo, 2019). It aids in predicting the value of a dependent variable from one or more independent variables.

Table 1. Model Summary

Sample	R	R Sq.	Adjusted R Sq.	Std. Error of the Estimate
1	.286 ^a	.62	.58	4.975

a. Predictors: (Constant), Website/ Portals

In Table 1, the calculated value for the coefficient of determination for hypothesis 1 is 0.62 which shows that 62% of the implications prove the existence of IWT occurrences in India are revealed through social media. The regression coefficient explains that there is an existence of IWT in various states of India which occurs through diverse digital platforms. It proves the hypothesis H1.

Table 2. ANOVA results from the analyzed data

Model		Sum of Squares (SOS)	df	Mean Square (MS)	F	Significant
1	Regression	144.977	1	144.977	5.859	.018 ^b
	Residual	1633.258	66	24.746		
	Total	1778.235	67			

a. Dependent Variable: Location

b. Predictors: (Constant), Website/ Portals

In the above calculation of table 2, the P-value is 0.018 which proves that a major influence of IWT in India and its existence is revealed through digital platforms. Since the P-value is less than the significance level of 0.05, it is evident that the null hypothesis (H10) will be rejected. It concludes that IWT exists in almost all the states of India and its existence is revealed through social media. One-way ANOVA is normally utilized when there is an individual independent factor or variable and the main objective is to inspect the difference levels of the factor which have a determinate effect upon the dependent variable (Liang et al., 2019).

Table 3. Descriptive analysis of the collected data

	N	Mean (M)	Std. Deviation (SD)	Std. Error (SE)	95% Confidence Interval for Mean		Minimum(Min.)	Maximum(Max.)
					Lower Bound(L)	Upper Bound(U)		

Facebook	10	3.00	1.054	.333	2.25	3.75	1	4
WhatsApp	17	3.47	.800	.194	3.06	3.88	2	4
youtube	29	3.31	.541	.101	3.10	3.52	2	4
others	12	1.83	1.030	.297	1.18	2.49	1	4
Total	68	3.04	.969	.117	2.81	3.28	1	4

Table 3 depicts the social media that aids in the prohibition of IWT in India. The highest mean value acquired concerning WhatsApp followed by Facebook and YouTube which reveals the social media platform. This in turn helps in prohibiting IWT in India from the year 2017 to 2020. It proves the hypothesis H2. Therefore, social media supports the prohibition of IWT in India.

Table 4. ANOVA analysis results

	SOS	df	MS	F	Significant
Between Groups	22.759	3	7.586	12.105	.000
Within Groups	40.109	64	.627		
Total	62.868	67			

The significant value obtained from above table 4 is 0.000 which indicates that there is a noteworthy association or impact between the independent and dependent variables. The significance obtained through the ANOVA test reveals that the independent variable represents the social media platform which contributes to the dependent variable representing the IWT in India and its prohibition. The result rejects the null hypothesis H₂₀. Social media platform helps in revealing the IWT occurrences in India and aids in prohibiting wildlife smuggling. Thus, the study proves the involvement of social media in IWT and their services in prohibiting the illegal trade of wildlife products.

Table 5. Species number and frequency

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid					
	hatha jodi	11	16.2	16.2	35.3
	leopard	2	2.9	2.9	41.2
	Pangolin	7	10.3	10.3	54.4
	parakeets	12	17.6	17.6	72.1
	red sand boa	2	2.9	2.9	75.0

sea coral	2	2.9	2.9	79.4
sea fan	3	4.4	4.4	83.8
star tortoise	2	2.9	2.9	88.2
turtle	2	2.9	2.9	92.6
wild hare	4	5.9	5.9	100.0
Total	68	100.0	100.0	

Table 5 depicts the species which are subjected to IWT in India from the year 2017 to 2021. The frequency table reveals the most susceptible species of illegal trade. The high-frequency value of 17.6% in parakeets and 16.2% on Hatha Jodi proves those are endangered species in India that should be conserved significantly.

Discussion

From the analysis of gathered data from respondents of the study using SPSS, the inferences of the study are made. The existing study (Chawla et al., 2020) focuses on the extinct species of Golden Jackal scientifically referred to as *Canis aureus* which is illegally poached and traded in the Indian market. The study concludes that social media helps in prohibiting the IWT and conservation of specific species of Golden Jackal. It focuses on a particular species. The present study also acknowledges it, since the social media platform contributes to the conservation of wildlife species and products. The regression and ANOVA analysis prove that social media helps conserve endangered species. Another existing work (Sharma et al., 2019) focuses on the investigation of the illegal poaching of monitor lizards under the false name of Hatha Jodi. The Agency of Wildlife examines the samples and identifies the traffickers through mitochondrial sequence analysis. Our study also demonstrates the cases arrested for illegal poaching of various wildlife products which include Hatha Jodi. The illegal traffickers focus on the poaching of Hatha Jodi which indicates the demand for particular products in the global market. It also reveals that wildlife species should be protected from traffickers and prevent them from becoming extinct.

Similarly, the existing study (Xu et al., 2019) examines the illegal poaching of wildlife products on the Twitter platform. The conventional study focuses only on the Twitter platform and analyses the traffickers through API. Our present study analyses the reports generated from open source and proves the various platforms utilized by the traffickers for IWT. It connotes the role of social media in controlling the IWT and thereby, contributes to the conservation of wildlife species and its products. The main limitation of the study is that the secondary data was gathered from open

source. Hence, the results might lack generalizability. The current study did not include certain significant components and techniques to identify the illegal trade of wildlife species in the platform of social media. However, the implication provided by the research can be useful in conserving endangered species in wildlife.

Conclusion

The rapid development and intrusion of technology, cybercrime, ransomware, and illegal online marketing have become globalized spectacles (Edwards, Jones, & Corcoran, 2022). Virtual marketplace influences the accessibility of the Internet and distribution of illegal poached wildlife products, human and drug products. Several attempts are carried out to monitor the IWT in the nation. The search parameters with the keywords of CITES-listed wildlife species are intruded into the digital platforms to identify the marketing of endangered species in the global market (Kubo et al., 2022). The market surveys are conducted to detect the repeated trading of specific species in a particular region. The official data provides the picturisation of illegal trade in India. The government agency should frame the powerful legalization to monitor and control the illegal traffickers of wildlife. The search engines of digital platforms should create awareness regarding endangered and conservative wildlife flora and fauna to identify the traffickers trading in the global market (Nijman et al., 2021). Automated technology of real-time characteristics contributes to detecting illegal content related to wildlife species. Additionally, the traffickers are identified by the authorities and subjected to imprisonment and penalties. The surveillance of IWT through a global digital platform is necessary for protecting biodiversity, and preventing the endangerment of particular extinct species.

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